Med-INA

The Mediterranean Institute for Nature and Anthropos (Med-INA) is a non-profit organisation with an international mandate. It was legally established in Greece in 2003. Its main aim is to contribute to a harmonious relationship between Anthropos (humankind) and Nature, by working on the interface between the two through research, action and public awareness. Focused on the Mediterranean Region, its priority areas of research and action are the following:

Cultural values of wetlands

Operating within the framework of the Ramsar Convention on Wetlands (Ramsar, 1971), Med-INA has been working to incorporate cultural values in the management of wetlands. For millennia, human beings have coexisted with nature, which provided resources essential for survival and the development of societies as well as inspiring an emotional and spiritual connection in spiritual and cultural practices in the Mediterranean. The weakening of this relationship has led to the degradation of ecosystems and the loss of the services and values of Mediterranean wetlands. By incorporating the study and promotion of cultural values in the management of these sensitive areas, Med-INA hopes to reconnect people with wetlands and to ensure a more sustainable future.

Sacred natural sites

The Delos Initiative seeks to study and promote the possibilities of synergy in the conservation of the spiritual, cultural and natural heritage of protected areas in developed countries. A Med-INA proposal, the Initiative was developed in the framework of the Specialist Group on Cultural and Spiritual Values of Protected Areas (CSVPA), within the IUCN World Commission on Protected Areas (IUCN/WCPA), with a view to maintaining both the sanctity and the biodiversity of these sites. To this effect, case studies relating to indigenous and mainstream faiths around the world have been studied, analysed and presented at workshops and in publications. Med-INA undertakes the day-to-day running of the Initiative, has staged workshops in collaboration with the IUCN/WCPA and coordinates the related publications. Med-INA has actively supported the initiatives made by the Holy Community of Mt Athos with a view to the integrated management of the Athonite Peninsula.

Landsapes

Intimately linked to natural and cultural heritage, landscapes are a key factor in individual and social well-being. In recent years, various destructive human activities, including urbanisation and large-scale infrastructure projects, have had a negative impact on landscapes. Med-INA studies and promotes landscape management and conservation issues in Greece and the Mediterranean, applying innovative landscape methodologies that can help tackle key environmental issues, empower community participation, enhance local identity and promote sustainable development. Med-INA played a decisive role in Greece’s application for membership to the European Landscape Convention (ELC) in 2010, actively claiming the Greek identity of the environment in its implementation, and participates in Council of Europe activities relating to the ELC.

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Culture and wetlands in the Mediterranean: an evolving story

edited by Thymio Papayannis and Dave Pritchard
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Med-INA
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The wise scientists, conservationists and decision-makers who established the Convention on Wetlands in 1971, although focused on water birds, had a broad conception of wetlands and their multiple values. This is demonstrated by the recognition of cultural values in the Preamble to the Convention.

Yet it was only in the late 1990s that the Ramsar Convention began to make systematic efforts to promote the incorporation of cultural aspects in the management of wetlands. This was made necessary by increasing awareness that the conservation of wetlands, and the wise use of their resources, depends on human beings as individuals and as societies.

Traditionally, humanity has been closely linked to wetlands, making use of their services and resources (including water) and assigning to them values which have also been spiritual in nature. Unfortunately, these links have now been weakened or severed in many places, which has meant that the services provided by wetlands have been under-appreciated. As a result, their perceived value has diminished, leading to the degradation and destruction of these sensitive ecosystems, which have suffered enormous losses during the twentieth century.

There is a powerful link between culture and human activities, and cultural forces can, when put to good use, form an effective basis for effective conservation and the wise use of wetlands. It is broadly understood that ‘culture’ is an integrated pattern of human knowledge, belief, and behaviour that depends upon the capacity for symbolic thought and social learning. Culture also involves a set of shared attitudes, values, goals and practices that characterises an institution, organisation or group. Therefore, focusing on the cultural values of wetlands –past
and present— is a promising path to increasing the appreciation of wetland values and services by the public, decision-makers and other stakeholders, and thus strengthening wetland conservation.

For greater synergy, the cultural aspects of wetlands need to be better integrated into wetland management. This is no easy task, as it has involved bringing new perspectives to conventional conservation philosophy and practices. In spite of these difficulties, in 2002 and 2005 the Ramsar Convention adopted Resolutions mandating such an approach, while 2008 saw the publication of practical guidance on Culture and Wetlands.

In parallel, activities seeking to incorporate cultural aspects into wetland conservation and management have been developed in various regions. Nowhere has there been greater progress than in the Mediterranean Basin, with research projects, actions, expert meetings and publications. Thus, this new book from Med-INA —prepared and published with the financial support of the MAVA Foundation— aims to relate the Ramsar guidance on Culture and Wetlands to the realities of Mediterranean wetlands. In so doing, it should point out much valuable advice, and contribute to the further development of such guidance in the future.

We hope that Med-INA will continue its invaluable work along these lines, and that, with the help of the newly re-established MedWet Culture Network, even more rapid progress will be made in the years to come.

Anada Tiéga

Secretary General, Ramsar Convention
**Acronyms**

AEWA  African-Eurasian Migratory Waterbird Agreement  
BR     Biosphere Reserves of UNESCO  
CBD    Convention on Biological Diversity  
CEHUM  Centro de humedales españoles [Spanish Wetland Centre], Gandia  
COP    Meeting of the Conference of Contracting Parties  
CWG    Ramsar Culture Working Group  
ELC    European Landscape Convention  
EU-WFD EU Water Framework Directive  
FAO    Food and Agriculture Organisation of the United Nations  
FFEM   Fonds français pour l’environnement mondial  
GEF    Global Environment Facility  
IBA    Important Bird Area  
ICOMOS International Council on Monuments and Sites  
ICCCROM International Centre for the Study of the Preservation and Restoration of Cultural Property  
IOP    International Organisation Partner of the Ramsar Convention  
IUCN   International Union for the Conservation of Nature  
MA     Millennium (Ecosystem) Assessment  
(MaB)   Man and the Biosphere Programme  
MEA    Multilateral Environmental Agreements  
Med-INA Mediterranean Institute for Nature and Anthropos, Athens  
MedWet Mediterranean Wetlands Initiative, Ramsar Convention  
NGO    Non-governmental organisation  
SEHUMED Sede para el estudio de los humedales mediterráneos, Valencia  
SPA    Special Protection Area  
SPP    Society for the Protection of Prespa  
STRP   Scientific and Technical Review Panel of the Ramsar Convention  
UNDP   United Nations Development Programme  
UNEP   United Nations Environment Programme  
UNESCO United Nations Educational, Scientific and Cultural Organisation  
WHC    World Heritage Convention/Centre of UNESCO  
WWF    World Wide Fund for Nature International
0. Introduction

Cultural aspects of wetlands: values and services

General concepts

Culture is a concept that has been around for centuries. It has been the subject of endless definitions (Kroeber and Kluckhohn, 1952), numerous publications and not a little controversy. This book is not the place to rehearse these issues, and the simple approach has been taken instead of following the definition used by UNESCO, according to which culture is the ‘set of distinctive spiritual, material, intellectual and emotional features of society or a social group, that encompasses, in addition to art and literature, lifestyles, ways of living together, value systems, traditions and beliefs’.

It should be noted, however, that almost all human activities produce culture in its broadest sense. This view rejects the perception of an exclusive and privileged ‘noble’ culture which ignores the everyday life of people. Wetlands are important habitats, and have supported life since the earliest societies. Human activities related to wetlands, and especially those that lie at the core of everyday life, thus number among the activities that can produce the most significant cultural values.

In addition, culture is neither static nor relates purely to the remains of past civilisations; rather, it evolves and connects humankind’s past with its future. Culture embraces the human and societal strengths, contemporary attitudes and creativity that may provide our most important resources for facing the environmental challenges of today. Yet cultural responses to environmental change are not receiving enough attention: climate change, for example, tends to be addressed as though only technocratic and market-based consumer responses are relevant.

Nurturing rich and vibrant cultural sensibilities with regard to our wetlands’ place in evolving everyday contemporary life is a crucial part of the currency of values and services that we all need to focus on and appreciate more fully. Societal issues such as weaknesses in governance and the lack of a common currency of values are often factors that impede the adoption of effective strategies, and these –fundamentally– are culturally determined.

Services and values

Value is a familiar concept relating to the human perception of a scale of significance and expressed in qualitative, and often quantitative, terms. The now well-
developed discipline of ecological valuation provides methods for attributing monetary figures to non-commercial factors as well as those that have a market value. The broader notion of ecosystem services, including cultural services, has been brought to the fore by the Millennium Ecosystem Assessment (MA, 2005), and is a way of expressing the tangible and intangible benefits which ecosystems provide to human beings. The distinction between cultural values and services is not always clear-cut, but it may be helpful to recognise both dimensions in analysing the overall importance of culture in relation to wetlands; for example, by considering services as properties of the ecosystem, and values as the expression of their high or low significance in a given context.

An appreciation of these dimensions helps to broaden and better integrate the different types of knowledge and understanding that can be brought to bear on developing the required conservation measures. It also reinforces the need for effective tools for providing a multidisciplinary education with regard to complex ecosystems – tools like those that arose from the integrated applied wetlands research carried out over many decades at the Tour du Valat biological research station² in the Camargue, France.

Wetland areas’ amenity value to visitors and other users is often greater when there is a combination of natural and cultural interests. Recognising that the attractiveness of an area’s biodiversity to naturalists and the attractiveness of its landscape to historians and artists are both services provided by a well-functioning ecosystem and can reinforce the value of maintaining it in good shape. This may provide opportunities for enhancing local income, which is another reason why it is important to conserve wetland sites. Encouraging and practising the combined management of sites’ natural and cultural heritage can thus result in multiple, mutually-reinforcing benefits.

Wetlands’ cultural values include their contribution to the identity of specific places. Thus the Doñana National Park in Spain is known to the general public through the El Rocío Pilgrimage, while Butrint in Albania benefits from the reputation of its archaeological site. Some wetlands maintain historic memories of past events, such as Schinia, Greece, the site of the battle of Marathon fought between the Greeks and Persians 2500 years ago. Others are locations with strong spiritual resonance in relation to belief-systems ancient and living, which can sometimes provide a focus for religious events like the floating pilgrimages in Albufera de Valencia, Spain, and Marano Lagunare, Italy. These are examples of services of a more intrinsic or intangible nature than, for example, an ecosystem’s biological productivity, but they are no less significant to humankind as reasons for valuing the wetlands concerned.

² Tour Du Valat Research Centre for the Conservation of Mediterranean Wetlands, Le Sambuc, 13200 Arles, France (www.tourduvalat.org, checked 8 April 2011).
Incorporating cultural aspects in the Ramsar Convention

When the Convention on Wetlands was adopted in Ramsar (Iran) in 1971, in its preamble the signatories affirmed their conviction that ‘wetlands constitute a resource of great [...] cultural [...] value’. Although the Convention is better known for its initial focus on wetland biodiversity, cultural aspects have in this sense been incorporated from the very start.

In multilateral agreements of this kind, however, concepts and principles are elaborated by slow and sometimes cumbersome processes in order to secure the global consensus that gives them their power. Serious attention to the incorporation of cultural aspects into the work of the Ramsar Convention began only in the late 1990s, and has been advancing slowly but positively since then as it progressively achieves more widespread acceptance (Pritchard, 2008).

Some early advances

It was in 1990 that a field concerning data on the social and cultural values of designated sites was added to the datasheet for Wetlands of International Importance (Ramsar sites). Soon afterwards, a presentation was given at a major workshop in Thessaloniki on the cultural values of Greek wetlands (Papayannis, 1992). Some years later, the seventh meeting of the Convention’s Conference of Contracting Parties (COP7, in San José, Costa Rica, 1999) broached the issue of culture more prominently in its theme People and Wetlands: the Vital Link.

These developments coincided with a rise in discussions on the subject of cultural issues in the framework of the Mediterranean Wetlands initiative (MedWet), following proposals from the Spanish wetland centre at the University of Valencia, SEHUMED3. The Mediterranean Wetlands Committee meeting (MedWet/Com) in 2000 in Djerba, Tunisia, featured a technical session on the subject, during which a draft Resolution presented by SEHUMED was discussed in detail (MedWet, 2000, SEHUMED, 2000). One year later, in Sesimbra, Portugal, MedWet/Com devoted its technical session to the cultural values of salinas (MedWet, 2001).

For its part, the Ramsar Secretariat has produced a series of widely-disseminated Culture [information] sheets (Ramsar, 2001) and published a pertinent article (Davidson, 2001).

3 Sede para el estudio de los humedales mediterráneos.
First deliberations by the Ramsar conference at the global level

In response to the growing interest, the Convention’s Standing Committee determined in 2001 that there should be ‘a broad-ranging discussion on the role of cultural and socio-economic issues in the Convention, and ways to enhance that role (including the question of a potential site selection criterion)’.

A draft Resolution on culture was prepared for the eighth meeting of the Conference of Parties (COP8, in Valencia, Spain), backed up by a substantial information paper. Considerable interest in the topic was generated during the COP, reinforced by a publication from Spain (Viñals, 2002) and a related exhibition organised by SEHUMED.

However, differences of opinion led to the establishment of a negotiating group under the chairmanship of Spain. In the lengthy debates that followed, one of the main arguments against dealing with cultural aspects within the framework of the Ramsar Convention was that these were already the responsibility of other international bodies such as UNESCO and the World Heritage Convention; additional concerns related to the implications for the world trade regime. Eventually, thanks to patient mediation and strong support from African countries and European Union member states, a Resolution on ‘Incorporating cultural values in the management of wetlands’ was adopted by the COP as Resolution VIII.19.

The Resolution includes a number of positive and far-reaching statements on the rationale for incorporating cultural values in wetland work, the need for broad collaboration with organisations and institutions responsible for cultural heritage, and the recognition of the rights of indigenous peoples and local communities. It encourages the Convention’s Parties to take cultural values into consideration in managing their wetlands and in designating them as internationally important sites (Ramsar sites). The text articulates a set of 27 guiding principles and includes a request from the COP for the further elaboration of related guidance.

Fig 0.2 Ruins of Mehdya Kasbah, Sidi Boughaba, Morocco.
COP9 (Kampala, Uganda, November 2005)

Notwithstanding Resolution VIII.19 and the mandate it provided, very little official work was done during the period that followed. The issue was picked up again at COP9 in 2005, where a technical session on culture was organised by MedWet and reports on progress were presented, mainly from the Mediterranean (Viñals and Morant, 2005; Med-INA, 2005).

A further Resolution on culture was tabled by the Ramsar Secretariat, and this again led to objections being tabled by a small number of countries. A new contact group co-chaired by Norway and Trinidad and Tobago heard new concerns relating to the rights of indigenous peoples (in countries including Australia, Brazil, Canada and the USA) and the risk of cultural values being used to camouflage agricultural subsidies. A specific proposal to develop a stand-alone criterion of cultural importance for the designation of Ramsar Sites perhaps inevitably failed to win sufficient support, but other elements eventually became adopted in Resolution IX.21 on ‘Taking into account the cultural values of wetlands’. The text of this Resolution included a careful reference to respecting obligations under other international agreements.

One significant step arising from this process was the establishment of a Ramsar Culture Working Group (CWG) convened by the Convention’s Secretary General, which began work in the summer of 2007. Consisting of representatives of the various regions, of UNESCO and the Convention’s International Organisation Partners (IOPs), its main task was the elaboration of a Guidance document based on the original COP8 information text.

COP10 (Changwon, Republic of Korea, October 2008)

The CWG worked on the Guidance document referred to above in 2007 and 2008, presenting drafts for review to the Ramsar regional meetings, two Standing Committee meetings and the Scientific and Technical Review Panel (STRP). Most of the consultative input received was incorporated, and an officially dissenting viewpoint from Brazil was included verbatim as an annex.

The Standing Committee decided not to present any further formal documents on culture to COP10, but to focus instead on positive work carried out during the preceding six years on the basis of Resolutions VIII.19 and IX.21. This was done at COP10 through a side event on culture, during which the Guidance document on ‘Incorporating cultural aspects in the management of wetlands’ was presented and widely distributed. A second related side event was organised by Japan and Wetlands International on ‘The cultural values of wetlands: Case studies from Asia’.

The Standing Committee also agreed that the CWG should continue to operate during 2009-2012, focusing inter alia on providing further guidance, and on the analysis and presentation of successful case studies.
Scope and purpose of this book

The present publication is a final output of the Med-INA project ‘Cultural aspects of Mediterranean wetlands’, which was launched in July 2007 and completed in December 2010.

The project

The general mission of Med-INA is to contribute to a harmonious relationship between Anthrope (mankind) and Nature by working on the interface between the two, particularly in the Mediterranean region, through research, action and public awareness. In implementing this mission, its major goals are: (a) to develop an integrated approach to the management and conservation of our natural and cultural heritage, (b) to promote the comprehension and application of sustainability, especially in the use of natural resources and (c) to encourage a better understanding of the inextricable relationship between cultural and natural values.

Within the framework of the Ramsar Convention and its Mediterranean Wetlands Initiative (MedWet), Med-INA worked between 2003 and 2007 on incorporating cultural values in the management of wetlands through an initial project that analysed 21 Mediterranean sites. The results obtained led to a CD-ROM ‘Action for Culture in Mediterranean Wetlands’ (presented at Ramsar COP9 in 2005). Additional projects included providing support to the Ramsar Secretariat in implementing Ramsar Resolutions VIII.19 and IX.21. In the Prespa Lakes area, Med-INA helped the Society for the Protection of Prespa⁴ to establish a documentation and research centre dedicated to the relationship between human beings and nature.

Fig 0.3 Pelicans on traditional wooden boat, Lake Kerkini, northern Greece.

⁴ The Society was one of the first recipients (in 1999) of the Ramsar Wetland Conservation Award.
The second Med-INA project on the cultural aspects of wetlands seeks to understand, document and thus strengthen links between inhabitants and visitors in the Mediterranean Basin and its rich natural environment of wetland sites, and is supported by the MAVA Foundation. The project aims to contribute towards supporting the conservation of sensitive wetland sites in the region, which are currently under great pressure from urbanisation and other unsustainable development activities. In addition, it aims to enhance the interest of visitors in Mediterranean wetlands, with consequent benefits for the income of local communities and a wider appreciation of the special qualities and intrinsic value of these sites.

The following main objectives were defined for the project:

– Disseminating the current knowledge on cultural actions in Mediterranean wetland sites.

– Monitoring the development of these actions, drawing conclusions from them and advising on their future development.

– Increasing the capacity for the integrated management of the natural and cultural aspects of wetlands in the region through seminars and publications.

A new key objective was added in 2009: to apply the Ramsar guidance on Culture and Wetlands issued in 2008 and to evaluate its results.

Within the project framework, an international workshop was organised in Greek Prespa on 23-27 September 2009 addressing the theme ‘Towards an integrated approach to the cultural and natural values of wetlands’. Three books have also been published (Papayannis, 2008; Papayannis, 2010 and the present volume).

The book

The main purpose of this publication is to relate the Ramsar guidance on Culture and Wetlands to the realities of the Mediterranean. As detailed in the previous section of this publication, this guidance has been developed by the Ramsar Culture Working Group and is designed for a worldwide readership. It is imperative, however, that it is applied in specific regions and that lessons are learned from the experiences so gained: lessons that could concern better approaches to the integrated management of our cultural and natural heritage, but also help in evaluating the Ramsar guidance and improving it. The Mediterranean may be seen as a special case in this process, since it brings together parts of three regions (Africa, Asia and Europe) which display considerable disparities and similarities. The implementation of the guidance in this trans-regional context therefore ensures a variety of social, cultural and ecological situations.

This publication is designed to be of use to people involved with wetlands in a range of roles, including decision-makers, wetland managers, conservationists and users of wetland resources, but also local inhabitants, visitors and the general public. It presents the current situation at a number of Mediterranean sites with
regard to human activities and their conservation impact in texts written by contributors with an intimate knowledge of the sites in question, as well as in generic texts on activities related to wetland activities. The contributors are not necessarily culture specialists, but all are involved in various aspects of wetland management. The publication has thus acted as a training exercise in informing and sensitising wetland experts to taking cultural aspects into account in their work.

In addition, this intellectual exercise has provided ample illustration of the applicability of the Ramsar guidance to the conservation of these areas’ natural and cultural heritage. This, in turn, has generated feedback which can be used in extending and improving the Ramsar guidance.

The book’s structure follows that of the Ramsar guidance. It starts with an introduction and a first chapter on general guidance featuring the approaches developed by Ramsar and UNESCO, and referring more specifically to integrated wetland management. The second chapter deals with human habitation in relation to wetlands. Beginning with cultural landscapes, it continues with archaeological and historic settlements and structures. The third chapter covers the primary uses of wetland resources and their cultural aspects, including agriculture and stockbreeding, fishing and aquaculture, hunting, salt extraction and the use of water. The fourth chapter examines secondary uses of wetland resources, including food and gastronomy, tourism, leisure and sports, festivals, celebrations and events. The fifth chapter is dedicated to traditional and contemporary knowledge, belief systems and social practices; it covers scientific research and education as well as spirituality and beliefs and artistic expression.

The final chapter draws conclusions from the material presented and develops proposals for improving the guidance. These proposals have been submitted to the Ramsar Secretariat for analysis by the Culture Working Group and the Scientific and Technical Review Panel (STRP) of the Convention.

All feedback and comments on the content of this book are welcome, including correction of errors, communication of good case examples, suggestions for further research and offers of collaboration. Communications should be addressed to secretariat@med-ina.org.

References


chapter 1
Nature and culture in wetlands: General guidance

As mentioned in the Introduction, a number of international organisations have become increasingly concerned in recent years with a more balanced approach to nature and culture, and have attempted to introduce cultural aspects into the management of natural sites.

UNESCO in particular has played a key role—directly and indirectly—in developing and promoting a holistic view of human heritage both natural and cultural. Its World Heritage Convention has recognised cultural and natural sites separately as well as mixed sites for both types of interest and ‘cultural landscapes’ which are the result of interaction between human beings and nature.

Since quite a few of the World Heritage Sites are wetlands (see Table 1.3, p. 37), the experience of UNESCO in integrated management is highly pertinent and provides a general argument and framework for integration. This is summarised by Giorgio Andrian from UNESCO’s Venice office.

Through its Culture Working Group (CWG), the Ramsar Convention in turn developed guidance on culture and wetlands late in 2008. This is presented in a paper by Dave Pritchard, recipient of the Ramsar Award in 2008 and a leading member of the CWG.

It is clear from these two papers that closer collaboration between the World Heritage and Ramsar Conventions would be beneficial to both: reporting under the two Conventions could be streamlined, for example, and duplication avoided; technical guidance could be prepared jointly, integrating their separate experiences; site monitoring could also be organised jointly, creating economies of scale and stronger conservation enforcement.

At the planning and site level, more focused advice on preparing integrated management plans for natural and cultural heritage in wetlands is provided in a third paper by Thymio Papayannis, Co-ordinator of the CWG and Director of Med-INA.

These three papers evince the need for further integration at all levels. Whether it be between concerned MEAs, government services, complementary disciplines within the human and natural sciences, wetland managers and culture custodians, the effective conservation of sensitive sites requires much closer collaboration, especially at the management level.

< Fig 1.0 Canal in Venice.
Integrated management of natural and cultural values of wetlands: the contribution of UNESCO

Giorgio Andrian

Abstract
This paper focuses on the contribution offered by the United Nations Educational, Scientific and Cultural Organisation (UNESCO) in relation to the adoption of integrated approaches to the management of natural and cultural values of wetlands. Two major components of UNESCO’s role in the international community are highlighted, namely (a) the conceptual framework and (b) the related operational ‘toolkits’. In terms of concepts, incorporating the cultural dimension in relevant policies and taking a values-based approach to assessing natural and cultural assets represents the most significant contribution. In terms of operations, fostering the adoption of well-known multilateral legal frameworks and designation schemes—as in the case of the UNESCO World Heritage Convention and Biosphere Reserves—contributes to the improvement of in situ management processes.

Keywords: Cultural and natural heritage, values, UNESCO designated sites (World Heritage sites and Biosphere Reserves), transboundary co-operation, geo-politics

Introduction
‘The new humanism entails protecting biodiversity together with cultural diversity’: thus stated Mrs Irina Bokova, UNESCO Director General, at a public event in October 20101. She continued by mentioning the role of World Heritage sites as ‘symbols of peace’ and emphasising the importance of the universal values embedded within the Organisation’s conceptual and operational frameworks. Her words reflect one of the most significant contributions that UNESCO has made to the international community in terms of integrating the cultural dimension into specific territorial policies (Mayor, 1997).

The Director General’s speech also affirmed that ‘as regards their universal values, the sites listed by UNESCO are of the utmost importance to international co-operation, mutual understanding among peoples, social stability and development’. This implies that the ultimate goal of managing these areas goes beyond a

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1 The lecture was given on 7 October 2010 at the Università Cattolica del Sacro Cuore, Milan (Italy), during a ceremony in which Mrs Bokova was awarded an honorary degree in European and International Politics (the full text is available at http://unesdoc.unesco.org/images/0018/001896/189621e.pdf, checked 8 April 2011).
separate consideration of their natural or cultural importance, and requires a more holistic approach.

An interesting example of the integration of various international designations is provided by the Škocjanske jame (Škocjan Caves) park and its surrounding area in Slovenia (Fig. 1.1). The three regimes –namely the UNESCO World Heritage, UNESCO Biosphere Reserve and the Ramsar Site– represent a chronological and spatial development that reflects an organic and coherent territorial vision –that of providing gradual and progressive degrees of protection –and formal recognition– for an underground ‘natural phenomenon of global significance’ and its related surface territories in Slovenia (Fig. 1.2).

Fig. 1.1 Škocjan Caves park and its surrounding area, Slovenia.

Fig. 1.2 Map of the broader area of Škocjan Caves park.

The UNESCO conceptual and operational frameworks referred to make a contribution to the broader discourse on nature conservation and the conservation of places of international significance. The Organisation’s long experience, most of which relates to its designated areas (World Cultural and Natural Heritage sites as well as Biosphere Reserves), has contributed directly and indirectly to the practices developed specifically for wetlands, and in particular wetlands of international importance as defined by the Ramsar Convention.

‘Heritage sites and objects must be understood in relation to their context, in other words, holistically’ writes Mason (2002), thus stressing the need to adopt a values-based approach to managing sites of international importance. Significant changes in the public perception of wetlands—from impoverished areas to be drained to valuable sites to be protected for water purification and biodiversity conservation—signifies the challenge of balancing cultural and natural considerations in an integrated approach.

Biological and cultural diversities: the challenge of adopting a values-based integrated approach

Since its establishment in 1945, UNESCO has had a multipurpose mandate in which the ‘C’ for Culture soon became one of the most distinctive features of its worldwide activities. This led to the cultural component being interjected into other sectors: the challenge of creating synergies between the safeguarding of biological diversity and cultural diversity has been of particular interest. The constant mutual adjustments between the Organisation and its Member States in the implementation of its culture- and natural heritage-related activities led to a progressive refining of the various strategies for UNESCO designated areas (the various updates made to the World Heritage Convention Operational Guidelines, for instance).

Recently, UNESCO contributed to the United Nations High-Level Round Table on ‘Culture in Development’ by tabling a concept note based on the proposition that ‘culture is an integral part of development’. In this, cultural factors were seen as influencing ‘lifestyles, individual behaviour and consumption patterns, values related to environmental stewardship and the ways in which we interact with our natural environment’.

More importantly, it is pointed out that cultural diversity has a decisive role to play in tackling current ecological challenges (e.g. climate change, preventing biodiversity loss and ensuring environmental sustainability): ‘there’s much more to learn from the environmental management skills embodied in local, rural or

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3 Held at the United Nations in New York on the occasion of the UN Summit on the Millennium Development Goals (20-22 September 2010).


5 ‘For UNESCO, the cultural dimension of development underlies the protection and promotion of cultural diversity in different forms, in particular through initiatives to safeguard cultural heritage—both tangible and intangible—and to protect cultural properties against looting and illicit trafficking or by offering diversified cultural goods and services’.
indigenous peoples, including multi-use strategies of appropriation, small scale production with little surplus and low energy needs, as well as a custodial approach to land and natural resources that avoids waste and resource depletion’. These observations highlight the relevance of indigenous knowledge being considered on a par with scientific knowledge, which is typically the basis on which cultural and natural resources are assessed and managed: ‘not only are biological and cultural diversity linked to a wide range of human-nature interactions, but they co-evolved, are interdependent and mutually reinforcing’.

Intent on providing both conceptual and operational frameworks to a larger group of stakeholders, UNESCO adopted an intersectoral approach; table 1.1 recalls the major programmes, projects and initiatives operated by the Organisation in this context. The inclusion of the ethical dimension of biodiversity (the specific initiatives are listed in the second column of Table 1.1) reflects the importance the Organisation has always attached to these issues in relation to scientific development in general. ‘Bioethics’ is one of the two primary areas (the other is the ‘Ethics of Science and Technology’) in which UNESCO pursues its ethical mandate: namely, acting as (i) a laboratory of ideas, (ii) a standard setter, (iii) a clearing house and (iv) a capacity builder.

<table>
<thead>
<tr>
<th>Biodiversity and cultural diversity</th>
<th>Ethical dimension of biodiversity</th>
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<tr>
<td>LINKS Programme11</td>
<td>Ethics of Science and Technology Programme</td>
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<tr>
<td>World Heritage Cultural Landscapes</td>
<td>Bioethics Programme</td>
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<td>Sacred Natural Sites and Cultural Landscapes</td>
<td>Global Ethics Observatory</td>
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<td>Biosphere Reserves</td>
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<td>Biocultural Protocols for access and benefit sharing</td>
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<td>Agro-cultures</td>
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<td>Science, methodology and experience</td>
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<td>Knowledge and practices concerning nature and the universe</td>
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<td>Biodiversity and languages</td>
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<td>Cities of gastronomy</td>
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Table 1.1 UNESCO’s activities in biodiversity, cultural diversity and ethics.

6 ‘Since its involvement in promoting international reflection on the ethics of life sciences in the 1970s, UNESCO continues to build and reinforce linkages among ethicists, scientists, policy-makers and civil society to assist Member States in enacting sound and reasoned policies on ethical issues in science and technology’ (http://www.unesco.org/new/en/social-and-human-sciences/themes/about-ethics, checked 8 April 2011).

7 Primarily by providing an intellectual forum for multidisciplinary, pluralistic and multicultural reflection on the ethics of science and technology through, for instance, the International Bioethics Committee (IBC) and Inter-governmental Bioethics Committee (IGBC).

8 By pioneering normative action in bioethics through, for instance, the Universal Declaration on the Human Genome and Human Rights (1997), the International Declaration on Human Genetic Data (2003) and the Universal Declaration on Bioethics and Human Rights (2005).

9 Through the development of the Global Ethics Observatory (GEObs).

10 By providing Member States with the tools and technical support they need to enhance their national ethics infrastructure (e.g. the Assisting Bioethics Committees [ABC] and the Ethics Education Programme [EEP]).

While the criteria for the identification of the UNESCO sites of international relevance have remained objectively focused on relatively static characteristics (e.g. the sites’ geological features), a growing awareness of the importance of the value system(s) adopted in managing and assessing those sites has emerged (Andrian, 2006).

These conceptual perspectives imply complex processes with a strong socio-cultural dimension which transcends the ‘expert cataloguing’ mentality. The practical difficulties of this approach are primarily related to the fact that values vary over space and time and exist in a contested socio-political context that may change, sometimes very rapidly12.

Table 1.2 synthesises a categorisation of types of values according to recent thinking13.

<table>
<thead>
<tr>
<th>Categories</th>
<th>Values</th>
<th>Values</th>
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<tbody>
<tr>
<td>Macro-categories</td>
<td>These values are at the heart of traditional conservation and contribute to the process of cultural affiliation14</td>
<td>Economic valuation is one of the most powerful ways in which society identifies, assesses and decides on the relative value of things</td>
</tr>
<tr>
<td>Sub-categories</td>
<td>Historical values</td>
<td>Use values (market values)</td>
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<td></td>
<td>Cultural/symbolic values</td>
<td>Non-use values (non-market values)</td>
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<td>Social values</td>
<td>Existence values</td>
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<td></td>
<td>Spiritual/religious values</td>
<td>Option values</td>
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<td></td>
<td>Aesthetic values</td>
<td>Bequest values</td>
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</tbody>
</table>

Table 1.2 Cultural heritage categories and values. Source: Mason (2002).

No one single methodological approach can be comprehensive; rather, various disciplines and types of expertise provide practitioners with a wide spectrum of methods, both quantitative and qualitative.

Mason (2002) emphasises that ‘choosing a method is not only a matter of choosing among different experts/academic discourses; it also embodies a political gesture as to whose analyses, voices and values are included in the decision-making mix’. In order to simplify the complexity of tools and methods available, some internationally recognised initiatives have aimed to set standards and procedures.

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12 This is particularly evident in countries in transition where, for example, a newly independent status or drastic change in political regime can bring the natural and cultural heritage into the sphere of power politics.


14 Cultural affiliation means that there is a relationship in the form of a shared group identity which can be traced historically or prehistorically (Determining Cultural Affiliation Within NAGPRA www.nps.gov/history/nagpra/training/Cultural_Affiliation.pdf, checked 8 April 2011).
From theory to practice: the relevance of internationally designated sites

Alongside the development of the concepts mentioned above, several of UNESCO’s multilateral agreements relating to culture have made their own contribution. The most relevant are the Convention Concerning the Protection of the World Cultural and Natural Heritage (1972, better known as the World Heritage Convention), the Convention on the Protection of the Underwater Cultural Heritage (2001), the Convention for the Safeguarding of the Intangible Cultural Heritage (2003), and the Convention on the Protection and Promotion of the Diversity of Cultural Expressions (2005).

The World Heritage Convention and its World Heritage List of sites is one of only two global intergovernmental Multilateral Environmental Agreements (MEAs) that require the designation of a network of specific sites; the other is the Convention on Wetlands (1971), better known as the Ramsar Convention, with its List of Wetlands of International Importance or Ramsar Sites.

Although the inauguration of firm, ongoing co-operation between these two conventions has been advocated on various occasions, the existing Memorandum of Understanding has not yet explored options for activating further synergies at the site level. It seems that potential sites are, for the time being, stuck in a process which goes no further than listing and identifies, as of November 2009, 45 Ramsar Sites which overlap wholly or partly with sites in the World Heritage List.

UNESCO also hosts the Man and the Biosphere Programme (MaB) and co-ordinates its World Network of Biosphere Reserves, the only other global intergovernmental environmental protection network of sites in the world. There are physical overlaps here, too, between Biosphere Reserves and Ramsar Sites, which have resulted in additional co-operation between the two secretariats which has evolved from occasional joint technical missions into a more structured partnership.

On the international level, State Parties declare their commitment to preserving natural and cultural heritages of international significance by signing and ratifying conventions and other related MEAs. Ultimately, this does not automatically lead to better management at the area level; paradoxically, the existence of multiple designation regimes is not a guarantee in itself of mutually reinforcing protection.

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17 In total they are 83, as of the last official inventory (21 April 2009 available at http://www.unesco.org/mab/doc/brs/brs_ramsar.pdf, checked 8 April 2011).
18 As when the Ukrainian government threatened to deepen and enlarge the Bystroe Canal which it operates in the Danube Delta, a transboundary area whose multiple designation regime includes UNESCO WH and BR as well as Ramsar.
19 From the development of a Joint Work Programme to the establishment of a strategic partnership with the private sector (in the form of the ‘Star Alliance Biosphere Connection’).
The World Heritage Convention

Regarded by many as the ‘Nobel Prize for Nature’, the designation of a site under the World Heritage Convention provides protection to properties of recognised ‘outstanding universal value’.

Such designations identify those locations around the world which are of outstanding universal natural and/or cultural values, with a view to giving them appropriate protection and management. Adopted in 1972, the Convention recognises in Article 4 that each Signatory Party has the duty of ensuring the identification, protection, conservation, preservation and transmission to future generations of the cultural and natural heritage, as defined in Articles 1 and 2. The idea of combining the conservation of cultural sites with the conservation of natural sites originated in the USA. A White House Conference in Washington, DC in 1965 stimulated international co-operation to protect the world’s most outstanding natural and scenic areas and historic sites for the present and future citizens of the world. The proposal for the Convention was presented to the United Nations Conference on the Human Environment in Stockholm in 1972, and the ‘Convention concerning the Protection of World Cultural and Natural Heritage’ was finally adopted by the UNESCO General Conference on 16 November 1972. The selection criteria for sites are described in the Operational Guidelines for the implementation of the World Heritage Convention (last update, 2008).

Since the Convention came into force, a total of 911 sites has been listed: 704 cultural, 180 natural and 27 mixed. The recognition worldwide of the Convention’s importance is reflected in the number of states party to it – as of August 2010, 187 UNESCO Member States had ratified it – and by its ever-extending list of sites, which are currently located in 151 countries. Similarly, only two cases of delisting are recorded in the history of the Convention. Increasingly, the World Heritage Committee is also taking managing aspects into account when evaluating candidatures, requiring the State Party to clearly demonstrate how the site is to be governed in the light of its ‘statement of significance’. This development is the result of the ‘call for action’ effect generated by the preparation of the candidature not always being matched by a proportionate effort to take care of long-term management issues.

20 The concept of outstanding universal value is defined in para. 49 of the Operational Guidelines for the implementation of the World Heritage Convention as follows: ‘Outstanding universal value means cultural and/or natural significance which is so exceptional as to transcend national boundaries and to be of common importance for present and future generations of all humanity. As such, the permanent protection of this heritage is of the highest importance to the international community as a whole’.

21 At the UNESCO General Conference on 16 November 1972.

22 For further details, see the dedicated web site: http://whc.unesco.org/en/convention, checked 8 April 2011.

23 The guidelines can be consulted at http://whc.unesco.org/en/criteria, checked 8 April 2011.

24 ‘Mixed sites’ are those included on the basis of both natural and cultural criteria (e.g. the Ohrid Region in the FYR of Macedonia). For further details, see http://whc.unesco.org/en/list, checked 8 April 2011.
The designation process could be described as bottom-up in nature (see Fig. 1.3); the diagram seeks to convey the complex interrelations between the actors involved in the specific mechanism, as well as its intrinsic mission to guarantee a rigorous methodology for identifying sites to be listed. The process is set in motion when a State Party decides to propose a site in its territory for listing (step 1). To encourage countries to institute a proper selection procedure, national ‘tentative lists’ are provided on which candidate sites remain for a minimum of one year while they are thoroughly researched and compared with other sites of outstanding value elsewhere in the world before being officially proposed\(^{25}\). External Advisory Bodies\(^{26}\) are then asked (step 2) to review the tentative list before forwarding them with comments to the World Heritage Bureau (step 3), which prepares the dossiers for the final discussion (step 4) that takes place at the level of the World Heritage Committee\(^{27}\). At its annual meeting, the Committee analyses all the site candidatures accepted on the basis of the Advisory Bodies’ preliminary work and decides whether they should be included in the World Heritage List. The Committee’s decisions are transmitted back to the Parties via the Bureau and the Centre (steps 5 and 6).

![Diagram of the World Heritage (WH) Convention: Process of designation](image)

Fig. 1.3 The Convention’s designation system\(^{28}\).

The Committee also makes recommendations concerning sites that are already listed. State Parties are required to submit relevant information on the administrative and legislative steps they have taken to implement the Convention, along with a detailed report every six years on the state of conservation of their sites.

In addition to providing the support necessary for properly safeguarding the inscribed sites, the Committee’s decisions and recommendations are increasingly

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\(^{25}\) All the official documents have to be sent to the World Heritage Centre by 31 January each year.

\(^{26}\) The Advisory bodies are: The World Conservation Union (IUCN) for natural sites, and the International Council on Monuments and Sites (ICOMOS) and the International Centre for the Study of the Preservation and Restoration of Cultural Property (ICCROM) for cultural sites.

\(^{27}\) The organ is composed of 21 State Party representatives and elected by the UNESCO General Assembly.

\(^{28}\) IUCN is underlined since it is the Advisory Body for the natural sites specifically considered in this article.
encouraging the State Parties to use the candidature preparation processes for new sites as opportunities to foster international co-operation. For instance, the inscription of transboundary sites and serial sites is seen by the Committee as an appropriate step in this direction.

The Man and Biosphere programme and Biosphere Reserves

Launched in 1971 as an intergovernmental programme by UNESCO, the origins of the Man and the Biosphere Programme (MaB) go back to 1968, when the ‘Intergovernmental Conference of Experts on the Scientific Basis for the Rational Use and Conservation of the Resources of the Biosphere’ (shortened to ‘The Biosphere Conference’) was organised in collaboration with the Food and Agriculture Organisation of the United Nations (FAO) and IUCN.

The concept of Biosphere Reserves (BR) also appeared in 1971, when the idea was formalised of establishing a World Network of Biosphere Reserves as places where conservation and research would be combined. In accordance with the MaB Statutory Framework, BRs are defined as ‘areas of terrestrial and coastal ecosystems or a combination thereof, which are internationally recognised within the framework of UNESCO’s programme on Man and Biosphere (MaB)’.

In contrast to the World Heritage system, no Convention has been created in connection with MaB: in fact, the Statutory Framework adopted in combination with the Seville Strategy in 1995 serves to define BRs’ guiding principles and ultimate goals. The concept of a World Network of Biosphere Reserves has been defined in order to enhance the effectiveness of individual BRs and to strengthen co-operation, understanding and communication at the regional and global level.

During the first years of the Programme’s existence, proposed BRs largely corresponded to pre-existing protected areas, and the initial interpretation of MaB was primarily focused on conservation (mostly of genetic resources and biological diversity). In 1995, at the Seville Conference, a complete revision of MaB and its operational mechanisms was carried out: the adoption of the Seville Strategy and the Statutory Framework for the World Network marked a dividing line between the Programme’s first and second generations.

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29 As recently reiterated by Mr Bandarin, World Heritage Centre Director, on the occasion of the meeting of representatives of Italian World Heritage cities (Florence, 2008).
30 Serial sites are those which link together various ‘core areas’ (which may be located in different countries) within the same designation. An interesting example is given by the transboundary initiative, currently in preparation, to promote a network of serial mountain heritage sites in the Alps.
32 The operation of the global Network is supported by regional and/or thematic networks such as AfriMAB, ArabMAB, CYTED, EABRN, EuroMAB, IberoMAB, PacMAB, REDBIOS, eaBRnet and SACAM, working mostly with the UNESCO Regional Offices.
Following the adoption of the Strategy, more attention has been paid to the two other core BR functions: fostering development and providing logistical support. ‘Biosphere Reserves are not just protected areas’ became the new slogan, signalling a need to put more emphasis on the ‘buffer zone’ and ‘transition zone’ elements of the BR concept, and not to focus purely on the ‘core zone’\(^33\). Fostering economic and human development in ways that are socio-culturally and ecologically sustainable became as important as identifying areas exclusively for nature conservation. The ‘logistics’ function refers to the provision of support for demonstration projects, environmental education and training, research and monitoring related to issues of local, regional, national and global importance. Ultimately, BRs are designated as ‘learning sites’, which embody science’s original role in driving management innovations (Fall and Andrian, 2004).

In a process broadly equivalent to that for World Heritage sites (Fig. 1.4), UNESCO Member States propose potential BR territories (step 3): there is no particular timeframe within which proposals should be received by the MaB Secretariat (step 4).

\[\text{Fig. 1.4 The MaB process for Biosphere Reserve designation.}\]

Less well-known than the World Heritage Convention, the MaB Programme nonetheless represents a significant platform for activities concerning designated areas. The number of Biosphere Reserves has grown constantly, reaching 564 sites in 109 countries by 2010\(^34\).

An increasingly important element of the work of UNESCO and its Ecological and Earth Sciences Division, which hosts the MaB Secretariat, involves coordinating its activities with those of MEAs and their Secretariats –within the five

\(^{33}\) Core, buffer and transition, the three components of BR zoning, convey a decreasing degree of formal protection.

\(^{34}\) See [www.unesco.org/mab](http://www.unesco.org/mab).
biodiversity-related Conventions, in particular— in order to ensure greater complementarities and synergies35.

The existence of two different UNESCO designations poses its own challenges for creating synergies. For example, the World Heritage site and Biosphere Reserve systems each has a separate reporting mechanism, even though the same organisation is ultimately responsible for both. Several internal and external reasons have prevented a more substantial co-operation between the two Secretariats: On the internal (UNESCO) side, the fact that the MaB Secretariat depends on the ‘Science’ sector while the WHC is affiliated to the ‘Culture’ sector results in formal difficulties in developing joint initiatives36. Externally, there is often a lack of coherence in addressing UNESCO’s various governing bodies; for example, the activities related to the World Heritage Convention are often given more political attention and financial support.

Conclusions

The brief overview provided in this paper highlights the importance of both the conceptual and operational framework provided by UNESCO to the international community; for example, the inclusion of specific ‘natural’ and ‘cultural’ criteria in the World Heritage Convention Operation Guidelines has contributed worldwide to fostering a proper consideration of these issues in the planning process of designated sites. The high international visibility of the UNESCO designated sites does not in itself guarantee better protection, but it certainly contributes to keeping the focus of the various stakeholders on the effective management of the inscribed sites. In the case of both World Heritage sites and Biosphere Reserves, the periodic reporting mechanism encourages Member States to provide continuity in managing the ‘uniqueness’ that was initially inscribed.

Developing concepts, administrative frameworks and policy mandates through a body like UNESCO provides a political personality and source of authority for action by the international community; it also enhances negotiation between governments by providing a context that spotlights how issues can be scaled up from the local to the international level (Pocock, 1997).

In addition, the capacity provided by UNESCO for pulling together intellectual resources and activating well-structured and widespread operational mechanisms, guidance and governing frameworks (mainly in the form of conventions and treaties) shows an example of how multilateral systems can be efficient and effective in fostering good environmental governance (Musitelli, 2003).

35 As well as the World Heritage Convention, these are the Convention on Biological Diversity (CBD, 1992); the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES, 1973); the Convention on the Conservation of Migratory Species of Wild Animals (CMS or Bonn Convention, 1979); and the Convention on Wetlands (Ramsar, 1971).

36 Despite constant attempts to encourage more collaboration and inter-sectoral activities, the existence of different administrative compartments in the respective UNESCO sectors tends to discourage co-operation.
The specific role of UNESCO and its designated sites offers opportunities for the mutual reinforcement of the role of the Ramsar Convention in respect of wetlands of international importance. Further co-ordination – e.g. through joint reporting and assessments – could reduce the workload of the Contracting Parties and improve the international protection regimes concerned.

<table>
<thead>
<tr>
<th>State</th>
<th>Ramsar Site</th>
<th>World Heritage Property</th>
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<tbody>
<tr>
<td>Albania</td>
<td>Butrint, 2003</td>
<td>Butrint, 1992, 1999, Cultural site</td>
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<td></td>
<td></td>
<td><em>Criteria: Testimony to cultural tradition</em></td>
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<td></td>
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<td><em>Ref: 570bis</em></td>
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<tr>
<td>Algeria</td>
<td>La Vallée d’Iherir, 2001</td>
<td>Tassili n’Ajjer, 1982*, Cultural and natural site</td>
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<td></td>
<td><em>Criteria: Human creative genius; Testimony to cultural tradition; Natural phenomena or beauty; Major stages of Earth’s history</em></td>
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<td><em>Ref: 179</em></td>
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<td></td>
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<td><em>Criteria: Significant natural habitat for biodiversity</em></td>
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<td></td>
<td></td>
<td><em>Ref: 219bis</em></td>
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<tr>
<td>France</td>
<td>Baie du Mont Saint-Michel, 1994</td>
<td>Mont Saint-Michel and its Bay, 1979, Cultural site</td>
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<td></td>
<td></td>
<td><em>Criteria: Human creative genius; Testimony to cultural tradition; Heritage associated with events of universal significance</em></td>
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<td><em>Ref: 80bis</em></td>
</tr>
<tr>
<td>Lebanon</td>
<td>Tyre Beach, 1999</td>
<td>Tyre, 1984*, Cultural site</td>
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<tr>
<td></td>
<td></td>
<td><em>Criteria: Testimony to cultural tradition; Heritage associated with events of universal significance</em></td>
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<td><em>Ref: 299</em></td>
</tr>
<tr>
<td>Slovenia</td>
<td>Škocjanske jame [Škocjan Caves], 1999</td>
<td>Škocjan Caves, 1986, Natural site</td>
</tr>
<tr>
<td></td>
<td></td>
<td><em>Criteria: Natural phenomena or beauty; Major stages of Earth’s history</em></td>
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<tr>
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<td></td>
<td><em>Ref: 390</em></td>
</tr>
<tr>
<td>Spain</td>
<td>Parque Nacional de Doñana, 1982</td>
<td>Doñana National Park, 1994, Natural site</td>
</tr>
<tr>
<td></td>
<td></td>
<td><em>Criteria: Natural phenomena or beauty; Significant ecological processes; Significant natural habitat for biodiversity</em></td>
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<td></td>
<td></td>
<td><em>Ref: 685bis</em></td>
</tr>
<tr>
<td>Tunisia</td>
<td>Ichkeul, 1980</td>
<td>Ichkeul National Park, 1980, Natural site</td>
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<tr>
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<td><em>Criteria: Significant natural habitat for biodiversity</em></td>
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Table 1.3 Ramsar sites and World Heritage properties in Mediterranean countries.

A List of Ramsar Wetlands of International Importance that are also inscribed (all or partly) on the World Heritage List under the UNESCO Convention concerning the Protection of the World Cultural and Natural Heritage.

An asterisk (*) denotes World Heritage Sites that are not fully contiguous with the Ramsar site.

The following points should be noted:

– All 25 Mediterranean countries have Ramsar sites (362 in total).
– Only eight of these 362 sites have been designated a World Heritage Property.
– Of these eight World Heritage Properties, four are designated for nature, three for culture and only one for both nature and culture.
– No new wetland site in the Mediterranean has been designated a World Heritage Property in the past twenty years.
The ideas and ideals underpinning the founding principles of UNESCO are an important basis for international co-operation on values-based integrated approaches to the management of some of the world’s most important sites.

References


Gaudry, K.H. (2007), Protected Areas Initiatives and Local Governments: Interpreting Discourses and Development, Masters thesis presented at the Faculty of Forestry and Environmental Sciences, University of Freiburg, Germany.


Culture and wetlands: the new Ramsar Guidance

Dave Pritchard

Abstract
The primary global context for recognising interactions between culture and wetlands is provided by the Ramsar Convention on Wetlands (1971). A milestone Ramsar guidance document on Culture and Wetlands was published in 2008: this paper gives a summary of the content of the guidance, and considers ways of putting it to best practical use. The document summarises some key fundamentals concerning the role of cultural issues in the management of wetlands, and then provides technical guidance on the day-to-day implementation of an enhanced understanding of wetland-related cultural issues.

Two schemes of suggested actions for achieving a more integrated approach are described: one based on an elaboration of general objectives deriving from the policies, principles and responsibilities defined under the Convention, and a second based on a technical characterisation of the linkages between wetlands and culture. The guidance provides helpful organising tools, including a typology of relevant activities and a matrix for summarising and prioritising the cultural aspects of individual wetlands along with more detailed implementation advice. This paper ends with a look at future activities planned in this area through the Ramsar Convention’s Culture Working Group.

Keywords: Ramsar Convention; guidance; ecological character; typology; activities

Introduction
Subsequent chapters in this book provide a rich set of perspectives on specific wetlands and on individual cultural situations. Here we begin by looking at the recognition of wetland and culture interactions at the global intergovernmental level, and examining what help is available from the one formal treaty at that level that focuses on these ecosystem types: the Convention on Wetlands (Ramsar, Iran, 1971) commonly known as the Ramsar Convention.

The main help provided by the Convention comes in the form of a Ramsar guidance document on Culture and Wetlands (Papayannis and Pritchard, 2008). This was launched at the 10th meeting of the Conference of Contracting Parties (COP10) in the Republic of Korea in 2008, and has been distributed in hard copy.
and on CD-ROM in English, French and Spanish, as well as being available for

Following some points on its context, the present chapter provides a summary of
the content of the guidance, and will hopefully stimulate thought on the best
ways of putting it to practical use.

**Context**

There is a particularly difficult balance to strike, in the context of a Convention,
when pronouncing at an international level on issues which are by definition
rooted in a variety of locally distinct approaches. Moreover, the common lan-
guage for discussing issues of this sort may not be quite as well-developed as it
is for the debate of scientific ecological issues.

The values at stake, however, are crucial. It has been seen to be essential to have
an institutionally coherent and well thought-out approach to all the many dimen-
sions of this subject that are relevant to the mission of the Ramsar Convention
(‘the conservation and wise use of all wetlands through local and national ac-
tions and international co-operation, as a contribution towards achieving sus-
tainable development throughout the world’) (Ramsar Convention, 2008).

Cultural issues have at times been very contentious in Ramsar Convention proc-
cesses, when attempts have been made to address them in the context of the des-
ignation of wetlands of international importance (‘Ramsar sites’). The emphasis
here, however, concerns the role of cultural issues in the management of all
wetlands.

‘Cultural services’, including their intangible aspects, are included as part of ‘ec-
osystem services’ as interpreted by the Millennium Ecosystem Assessment (Mil-
leennium Ecosystem Assessment, 2005). Since 2005, this has been incorporated
into the Ramsar definition of wetland’s ‘ecological character’:

> `Ecological character is the combination of the ecosystem compo-
nents, processes and benefits/services that characterise the wetland at
a given point in time. (Within this context, ecosystem benefits are de-
efined in accordance with the MA definition of ecosystem services as
‘the benefits that people receive from ecosystems’)’ (Ramsar Conven-
tion, 2005a).

It is thus now more important than ever that the Convention’s Parties are provid-
ed with correct and appropriate guidance on cultural aspects. The new docu-
ment thus helps with the obligation stemming from the Convention to maintain
the ecological character of wetlands, and this in turn is now part of the way
that the requirement that wetlands be put to ‘wise use’ (Article 3.1) is formally
interpreted:
Wise use of wetlands is the maintenance of their ecological character, achieved through the implementation of ecosystem approaches, within the context of sustainable development’ (Ramsar Convention, 2005a).

The guidance builds on two Conference Resolutions, adopted in 2002 and 2005, which express Ramsar policy principles concerning the importance of culture and wetlands (Ramsar Convention, 2002; 2005b). It was produced by the Convention’s Culture Working Group, the body that continues to lead in this area.

The content of the document

The underlying purpose of the Ramsar document is to provide technical guidance designed for wetland managers and others on the day-to-day implementation of an enhanced understanding of wetland-related cultural issues. The text includes a re-working of some earlier material37, refining its logic and making it more systematic to make it easier for cultural aspects to be incorporated where they need to be in wetland management. Overall, the document’s primary aim is to provide an action-oriented resource.

Fig 1.5 Cover of the Ramsar Guidance on Culture and Wetlands.

The guidance integrates and expands the various principles and elements of good practice listed in the two Resolutions, which thus remain firmly in effect as components of the Ramsar Parties’ formally adopted thinking. Examples of the issues covered in the Resolutions include:

37 More specifically, an Information Document tabled by the Ramsar Secretariat at Ramsar COP8 attached to the Resolution draft on cultural aspects of wetlands.
recognising and assessing the significance of wetland cultural values, including those associated with individual wetlands of international importance for their ecological values;
recognising the intimate links between cultural values and traditions and the sustainable management of wetlands and water resources;
maintaining relevant sustainable practices;
safeguarding, learning from and applying traditional knowledge;
promoting greater awareness and understanding;
integrating cultural values in relevant institutional structures, legal regimes, policies, strategies, management plans, impact assessments, monitoring programmes and other planning and decision-making processes;
facilitating the participation of local communities, indigenous peoples and other stakeholders in decision-making and management;
taking cross-sectoral, multidisciplinary and cooperative approaches;
compiling and using good-practice case studies.

The document’s first chapter covers a number of general considerations and includes a broader picture of what is being done in relation to cultural issues of relevance to wetlands, and by whom, in other fora and institutions, including other Conventions. A summary is provided of the history of attention to the subject in the Ramsar Convention, together with a scene-setting discussion on the place of wetlands in the cultural landscape, and the place of culture in the wetland landscape. This provides a rationale for recognising cultural values more completely than has been done hitherto.

There are three different types of situation that may be recognised:

(i) a situation where there is cultural interest in a wetland by a coincidence of location, meaning there is not necessarily any functional connection with the wetland ecosystem. The cultural interest is thus an additional dimension which needs to be taken into account, and in regard to which conflicts need to be avoided;

(ii) a situation where cultural interests arise from the ecological values;

(iii) a situation where cultural interests have produced the wetland value, for example through land-use practices, and where the objective would be to maintain the cultural interest as part of the key to maintaining the wetland’s ecological character.

The first chapter of the guidance also has a number of inserted text boxes which present summaries of case studies from around the world. These include the shaping of the fortunes of the civilisation of ancient Egypt by the seasonal flooding cycles of the river Nile, threats to the stilt-village fishing communities of Tonle Sap Lake in Cambodia, archaeological discoveries from fourteenth century ships sunk
in the Venice lagoon, and contemporary restoration of the traditional fishponds of Armagnac, France, for biodiversity, tourism and irrigation purposes.

Chapter two deals with relevant Ramsar policies and principles on different levels, and deals with the responsibilities of the Contracting Parties to the Convention. It then elaborates a scheme of nine objectives (conservation, management and more general objectives) based on these. For each objective, a set of suggested implementation actions is set out.

As suggested above, guidance of this kind can only be indicative. Cultural priorities are specific to a given society and to the particular context of each country, and the text emphasises this point. The document helps by setting out the Ramsar Parties’ existing collective thinking, and by acting as a source for a range of specific ideas to support and encourage all the parties concerned to proceed in a useful direction.

An appendix provides a suggested matrix tool for summarising and prioritising the cultural aspects of individual wetlands, drawn from work undertaken by the Mediterranean Institute for Nature and Anthropos (Med-INA).

The third chapter sets out a proposed typology of wetland-related activities that have associations with cultural values in one form or another. Not intended to be an exhaustive list, it covers over 60 of the most significant categories of activity in a three-level hierarchy, and includes items relating to habitation in wetland areas, to primary and secondary uses of wetland resources, to social practices and to knowledge and belief systems.
An extensive menu of suggested objectives and actions based on these items is also provided, building on the components of the Ramsar Resolution adopted in 2002.

The document therefore offers two schemes of actions: one based on Ramsar objectives, and one based on a technical characterisation of the linkages between wetlands and culture. The aim of both schemes is a more integrated approach to attending to wetlands’ natural and cultural values; as such, it is consistent with the concept that the best way to maintain ecological character is to embrace the ecological basis of cultural services.

Chapter four provides more detailed implementation guidance for some of the categories of action suggested in both schemes, with an emphasis on practical aspects of wetland management. Again this is constructed as an extensive menu of suggested possibilities accompanied by a linking narrative.

The point is emphasised that where primary resource use has some cultural significance, it is not automatically seen as positive from a Ramsar perspective because of that. All of the suggested objectives and actions must still be considered in a context of compatibility with the ‘wise use’ principle stemming from Article 3.1 of the Convention.

Ramsar Article 3.1:

‘The Contracting Parties shall formulate and implement their planning so as to promote the conservation of the wetlands included in the List, and as far as possible the wise use of wetlands in their territory’.

The guidance reflects a number of issues with a powerful link to various important ‘people-centred’ themes of work under the Convention, such as the agendas that have developed on water, agriculture, fisheries, poverty and education, as well as to human health (through traditional knowledge concerning wetland medicinal products, for example).

Great care has been taken in drafting the text to avoid problematic implications for the realm of international trade or other areas of political, legal or technical sensitivity.

The document presents a set of recommendations, including one general recommendation concerning the development of a Ramsar strategy for the enhanced incorporation of cultural aspects into the management and wise use of wetlands in the future. Taking this forward could be a key role for the Convention’s Culture Working Group. The guidance constitutes one step in a process, and it will have to continue to evolve in parallel with developments in knowledge and capacities. In the meantime, there is a good deal in the document that will help Contracting Parties and others make a meaningful difference on the ground.

**Continuing work**

As far as the continuing development of thinking and activity in this area is concerned, it is obviously a key aim to ensure that the guidance material is made widely available and actively disseminated among its intended audience (administra-
tors, policymakers, researchers, advocates and above all site managers). In addition to the hard copies, the CD and the website, ideas are always welcome with regard to other outlets and publishing methods and to expanded modes of web access. In 2009, a new area on the re-launched Ramsar website was allocated to information about activities relating to culture; this area is expected to develop further over time to allow access to all the Convention’s own culture-related material in a single location. It may also expand to include other related material, as well.

The invitation remains open for ideas on these issues to be sent at any time to the Ramsar Culture Working Group (via the addresses given on the website, or via the editors of the present volume). Ideas could also relate to possible sources of funding for, for example, translations of guidance materials into additional languages.

Discussion opportunities should also be used to explore and gather views on putting all the collated wisdom, experience, advice and guidance to work, and on making the best practical use of the guidance at the national and local level to influence policy-making, decision-making and everyday wetland management. All those interested are encouraged to ask themselves whose responsibility this will be in their own context. They are also encouraged to suggest additional sources of examples of real-life good practices to feed back into the collation of case studies and the evolving overview.

The continued accumulation of new ideas, experiences and insights is likely to lead to the further development and refinement of guidance in the future, and the existing document will evolve organically as necessary. This, however, is only one mechanism for providing central assistance; improved dissemination, networking, troubleshooting, the harmonisation of concepts and terms and the promotion of success stories will also play their part.

One area of action will lie with the Ramsar Culture Working Group, and the opportunity is taken here to make a brief reference to the Group’s planned activities between late 2009 and 2012, which feature seven distinct proposed work streams.

One of these covers the idea of the Ramsar culture strategy mentioned above, in whose development the Group would take the lead. Secondly, there is an obvious need for further networking in the sphere of the relationship between the Ramsar Convention and UNESCO, including the idea of a broader Ramsar liaison culture network beyond the Working Group itself. Regional versions of such a network could also be considered, and this has already been suggested for the Mediterranean (which in fact covers parts of three of the officially defined Ramsar Convention regions) through the mobilisation of the MedWet Culture Network.

Then there is a proposal relating to good-practice case studies, and another on the analysis of information included in Contracting Party national reports to the Convention’s Conference of Parties. Further work on guidance is also suggested.

38 The Guidance document has recently been translated into Japanese by Wetlands International Japan.
to ensure continual improvement, complemented by efforts with regard to external communications, including publications, workshops and other activities. Finally, there are some important links to manage with the work of the Ramsar Scientific and Technical Review Panel (STRP) over the same period, for example on the cultural dimensions of its tasks relating to ecological character description, human health and wetlands, poverty reduction, data needs and valuation of wetland ecosystem services.

Fig 1.7 Ramsar COP10, Changwon, Republic of Korea, 2008.

Conclusions

This chapter began with the international context of the Convention’s guidance, and will end by returning to that context. Much has been written in different places about culture and wetlands. One reason why the Ramsar guidance adds new value is that it represents the significant political strength of a global consensus on the organisation of thinking, sense of direction, priorities and linkages with regard to culture and wetlands. Furthermore, it defines a practical action agenda which shows what this all means in operational terms.

In conclusion, two examples from the European Union policy arena may help to illustrate the significance of what is at stake. In 2009, a study into reforming the EU Cohesion Policy, conducted at the request of the Commissioner for Regional Policy, called for interventions based on concepts of ‘place-distinctiveness’ (Barca, 2009). In so doing, it indicated a potentially new avenue for the application of ecosystem-related cultural values to regional development goals. The new Ramsar guidance shows that Ramsar Convention Parties already know what such a concept should mean in relation to wetlands.
In the second example, the KEA consultancy produced a report for the European Commission on the impact of culture on creativity in the post-industrial economy. This discusses opportunities for opening up new approaches to tackling social and environmental problems from a cultural standpoint, and the importance for this of being able to express the values of specific cultures while also developing shared norms and aspirations for society which go beyond the merely utilitarian. It spotlights the absurdity of a situation in which culture still seems to lie on the fringe of the European project as a subsidiary competence, while it actually forms the crux of our capacity to innovate and develop new economic, social and environmental paradigms (KEA European Affairs, 2009).

It could be argued that we have never needed these perspectives more than now. It should also be a cause for celebration that the wetland world is now equipped with a tool of the kind represented by the new Ramsar Convention guidance document: a text which demonstrates such a powerful level of agreement over underlying concepts and intentions, and provides such practical help in applying them in the field.

**References**


Integrating nature and culture in wetland management

Thymio Papayannis

Abstract

Integrating attention to the natural and cultural aspects of wetlands has been officially promoted by the Ramsar Convention since the end of the 1990s. Such an approach can reconnect people to wetlands and give rise to important benefits for wetland conservation and wise use. Until there are management bodies with unified responsibility for both sectors, cooperation must be built gradually and systematically between the managers of wetland sites and culture specialists, so that common targets can be established. In this process, the academic and NGO communities can play a significant role. Ongoing activities in the Mediterranean can strengthen such an integrated approach.

Keywords: Culture, management, nature, wetlands

As already underlined in the Introduction, human beings and their societies have since ancient times been inextricably connected to Mediterranean wetlands. In the past, this related mainly to the use of wetland services and resources and was reinforced by cultural and spiritual links. Such use of services and resources has left a rich cultural heritage which, evident still in material remains (archaeological sites, historic structures, artefacts) is in danger of disappearing in respect of intangible aspects (traditional knowledge, customs and practices, spiritual beliefs).

At the same time, the nature of these direct and indirect uses of wetland services and resources has changed in recent times. Many of the day-to-day links at a local level are weaker, although the importance of wetlands for protein, salt, reeds and navigation is still crucial in some of the less affluent Mediterranean countries. Throughout the region, the role of these systems in water supply, coast protection, flood control, biodiversity conservation and other services is more significant than ever. The conservation of wetlands clearly hinges on human attitudes and activities.

This has led to an understanding that the human aspects of wetlands must be integrated in wetland management processes. Many benefits can result from such a holistic approach, perhaps the most important of which is an enriched view of wetlands as areas of human involvement through the ages as well as hotspots of biodiversity. Such an integrated view may increase the perceived value of wet-
lands and contribute decisively to their conservation. Presenting information about wetlands in a way that more fully reflects their linked natural and cultural values could create a stronger attraction for visitors, increasing local income (for example from tourism) and thus (if managed correctly) strengthening conservation initiatives. In addition, the coexistence of historical cultural relics and contemporary human activities within sensitive ecosystems makes it necessary to take a unified approach to resolving or preventing conflict, and to maintain the cultural and natural heritage in tandem.

**Mandate**

Incorporating cultural aspects in wetland management has been officially mandated by decisions of the Conference of the Parties of the Ramsar Convention. Resolution VIII.19 (paragraph 19a) encourages Contracting Parties:

‘to include relevant aspects of cultural heritage in both the design and implementation of wetland management plans’,

while Resolution IX.21, in paragraph 13:

‘FURTHER ENCOURAGES Contracting Parties to incorporate cultural values in wetland policies and strategies, as well as in wetland management plans, and to communicate the results, thus contributing to the development of comprehensive and integrated approaches’.

These decisions were expanded in the advice provided by the Ramsar guidance document on Culture and Wetlands, under Conservation and Management Objective C+MO.1 (Papayannis and Pritchard, 2008: 34), which states:

‘To incorporate the cultural aspects of wetlands in management planning’.

Suggested implementation actions:

a) carry out research and undertake inventories of all relevant cultural aspects related to the site in question and select those that will be the subject of defined management objectives, with the active participation of relevant communities, groups, institutions and individuals, taking into account the guidance provided in the present document; and

b) incorporate in the management plan specific activities addressing the cultural aspects of the site.’

It should be added here that similar approaches to broadening the scope of wetland management have been promoted by other international multilateral or non-governmental organisations, such as the Convention on Biological Diversity (CBD), the International Union for the Conservation of Nature (IUCN) and the World Wide Fund for Nature International (WWF) (Bridgewater, 2007).
Dialogue towards common goals

The above mandate can only be effectively implemented if certain prerequisites are met. Up to now, albeit with notable exceptions, there has been limited technical interaction between the social and physical sciences. This needs to be corrected, and the initiative must come from the conservation scientists, as in most wetland sites they are responsible for management planning and related processes. Thus, intellectual exchanges among the disciplines involved will first allow a mutual understanding of the language, methods and concerns used by each discipline. Then the nature of the interfaces between disciplines will become evident, leading to the recognition of potential areas of conflict, but also of synergy. The next step should be an agreement on common goals, an essential task, though perhaps a difficult one. The difficulty is compounded by the need to take into account the views of a broader circle of concerned stakeholders as well as scientific and technical considerations.

Once contacts have been established and strengthened and goals agreed, common—or fully co-ordinated—activities can be launched relating to both the natural and cultural heritage. Research into the interface between human beings and nature should be encouraged and investigate causal relationships between the two as well as obtaining correlated data. Once joint knowledge resources are established, it will be possible to relate human and natural ‘events’ by means of spatial and temporal parameters which will help identify cause and effect relationships. The Centre for Man and Nature has started working along these lines in the Prespa Lakes region, and the first results appear highly promising (Malacou, 2010).

Fig 1.8 Fieldwork related to bird ringing, Evros Delta.


Governance options

On the governance side, there are various options that can be applied to bring about an integrated approach.

One option would entail co-ordination between those responsible for culture and nature conservation respectively. While the former are usually based in government services, either centralised in a ministry of culture or decentralised at the level of regions, prefectures or municipalities, the latter may be specific management bodies for major wetlands or –often– services related to ministries of the Environment or Agriculture. Collaboration among them can be difficult, as they belong to different administrations, have diverse backgrounds and are often located in different places. Often the modicum of collaboration that does exist is not systematic, being sought only after the emergence of a serious problem. In spite of such difficulties, efforts must be made on both sides to inform the other of their respective objectives and concerns, and to involve them in implementation activities.

Another approach would be to keep the wetland management process focused on clear ecosystem conservation issues, but to provide for the project team to be supported by cultural advisors from the public or private sectors. Such support could inform the project team and broaden its considerations to include at least a basic level of attention to cultural matters. On the other hand, such advisory contributions may remain academic with the cultural advisors marginalised and disappointed. It should be the responsibility of the management co-ordinator to ensure that the culture advisors are fully integrated into the team and to undertake any further action required to ensure that their contribution is taken into account.

A very promising third option would be to enlarge the mandate of the management body so that it covers both natural and cultural heritage. This would entail developing fully integrated management objectives, establishing a multidisciplinary management team and including culture specialists in the management body on a permanent basis. Although such an option would maximise the scope for genuine integration, it has generally not been applied since it tends to go against the philosophy of the public administration establishment in most Mediterranean countries (with the possible exception of Slovenia [Debevec, 2010]). Some progress, however, can be detected in sites where powerful NGOs play an active role, as in the case of WWF and the Italian Oasi, or Prespa and the Society for the Protection of Prespa.

Management planning

Wetland management planning in the Mediterranean varies considerably according to the different types of scientific approach used, and the social and administrative considerations that apply (Bonnet et al., 2005). Integrated planning, however, consists of a number of steps which should be generally applicable.
Consistency with adopted Ramsar guidance on management planning (Ramsar Convention, 2002) and community participation (Ramsar Convention, 1999) should be a guiding principle from the outset.

Collecting data is the first step and must be done in an informed and intelligent manner. Considerable time and funds are often spent on extensively and intensively collecting data that have little pertinence to the management process. Thus, deciding what data to collect is a key question that needs to be addressed from the very beginning. Naturally, the data should cover both the ecological and human aspects of each site. In addition, the validity of the data is a critical issue that must be addressed using clear standards, sampling protocols and validation processes. This becomes even more difficult –and necessary– in transboundary sites, where each side may have its own data collection system. A characteristic example of the difficulties to be faced is the Evros/Maritsa/Meriç River shared by three very different countries: Bulgaria, Greece and Turkey.

Such pertinent and credible data can provide a good basis for analysing relationships and positive or negative interactions between natural and cultural aspects. If done objectively and equitably, this can facilitate the setting of mutually acceptable targets. At this stage, the views of other stakeholders must be sought and taken into account, which complicates the process but ensures a deeper understanding of the issues.

Fig 1.9 Monitoring the pelican colonies in Greek Lesser Prespa Lake.

However, this in itself is not sufficient: the management planning targets provisionally agreed upon must be presented to the public —and local inhabitants, in particular— in a clear and understandable manner. Consultation meetings are a good method for explaining the options and proposed targets and for building consensus through well-structured dialogue, although they require social matu-
rity, which is not always easy to ensure. It should be stressed here that the implementation of the management plan ultimately depends to a large extent on establishing social consensus through such procedures.

Once targets have been agreed, planning activities must be developed for their implementation. If cultural aspects have been included among the targets, some of these activities will concern the cultural heritage of the site (such as the restoration and re-use of historic buildings), while others will concern both culture and nature (such as sustainable fisheries planning).

In the same spirit, regulatory measures must be developed in a comprehensive manner concerning key aspects such as land use, the regulation of productive and leisure activities and visitor management.

Finally, a system for monitoring the implementation of management measures must be put in place, as well as provisions for enforcing these measures, if required. This is a particularly delicate issue: if measures are applied in an unduly strict way without prior consultation, it can provoke local confrontations, while if they are applied too flexibly, the whole management plan may unravel with dire repercussions for wetland conservation. In many countries, archaeological and forestry services have managed to gain the requisite authority and public respect: there are lessons to be learned from their experiences.

The academic and NGO sectors

There is a distinct and important role for the academic and non-governmental (NGO) communities in such an integrated management process, as they can provide an independent analysis of issues. This is particularly helpful in cases of disagreement between the management planning team and key stakeholders or local inhabitants. However, the academic and NGO sectors can only be effective in this role if they manage to establish a reputation for competence and impartiality.

Unbound as they are by administrative rigour, these two sectors are also the most apt to be converted to an integrated view of the cultural and natural heritage, and to promote it among responsible authorities at the central, regional and local level. They can also convert visitors to this viewpoint through the operation of integrated visitor centres and the provision of suitable material. It should be pointed out here that visitor centres are operated by NGOs in a number of wetlands (including Sečovlje Soline in Slovenia, Amvrakicos Gulf in Greece and Sidi Bougriba in Morocco), where they provide the public with integrated information on nature and culture.

A third task the voluntary sector can undertake is encouraging, facilitating—and, if required, organising—the participation of local inhabitants in wetland management. If they handle this task sensitively, they could assume an advocacy role in favour of local communities, while maintaining their impartiality.
Future perspectives

There are a number of activities which, if carried out in the immediate short term, would be extremely helpful in encouraging integrated management practices in the Mediterranean. Continuing work that has been done in the region since the early 2000s, these activities could be carried out in the context of the MedWet Culture Network with the assistance of the Spanish Centre for Wetlands (CE-HUM), the Mediterranean Institute for Nature and Anthropos (Med-INA) and other partners.

Thus, a list of Mediterranean wetland sites exemplifying multiple values should be compiled which attempts to achieve an equitable balance of wetland type and situation, geographic distribution and management structure. Once such a list is established, the conservation status of the sites in relation both to their natural and cultural heritage should be assessed and correlated with the management practices being applied to each. Finally, improvement measures should be proposed which take into account the Ramsar Guidance on Culture and Wetlands and are adapted to the specifics of each site.

In addition, the use of cultural values in promoting wetland conservation efforts should be considered. As of late 2010, Med-INA is developing a project to study and promote such an approach in the cases of Karla Lake (Greece), which was drained in the 1960s; Larnaca Lagoon (Cyprus), which was degraded by the construction of an international airport; and the Bay of Tunis (Tunisia), which has been gradually backfilled to provide space for urban expansion. If successful, such a project would be an ideal demonstration of the importance of cultural values in wetland management and conservation.

Fig 1.10 Sampling in Akamas stream, Cyprus.
References


chapter 2

Habitation

Habitation is used here in its broadest sense to indicate human activities with a certain degree of permanence which are situated in, or are physically related to, wetlands. These activities leave a physical mark on the natural environment, ranging from the formation or transformation of landscapes by settlements to isolated structures in and around wetlands.

At times, these signs of human action may appear functionally unrelated to wetlands, or connected only by proximity. Ancient and traditional societies, however, rarely made choices by accident. Thus, throughout history the existence of a wetland with its water and other resources and services has been a pole of attraction for the groups or societies that have settled around it. This relationship, which is not always visible to the contemporary viewer, may require scientific analysis to be properly identified and documented.

The first part of this chapter deals with tangible signs of human habitation in wetlands revealed by archaeological remnants. Examples are discussed by means of case studies of sites in Albania, Bosnia and Herzegovina, Croatia, Greece and Turkey. The second part of the chapter considers wetland landscapes and the human activities that have transformed them, through a general paper and a specific example from northern Greece.

2.1 Settlements and structures

From prehistoric remnants of lacustrine settlements (such as Dispilio on the shores of Kastoria Lake in northern Greece), through Greek and Roman commercial outposts (such as Narona in Croatia and Empúries in Catalonia, Spain) to modern metropolitan centres (such as Tunis), a variety of settlements demonstrate the age-old attraction of wetlands for human habitation despite their historically bad sanitary reputation (including the spread of malaria). The conservation of abandoned settlements and archaeological sites is important as a valuable source of traditional knowledge, understanding and inspiration. Functioning settlements pose a greater challenge, however: while improvements in the quality of life of the present inhabitants and visitors must be permitted or even facilitated, along with unavoidable

< Fig 2.0 Roman antiquities in Butrint, Albania.>
urban expansion, this must be combined with safeguarding the integrity of adjacent or neighbouring wetlands and maintaining their ecological processes.

Fig. 2.1 Fort Santiago Chikly, Tunis Lake, Tunisia.

Ramsar guidance

The Ramsar Guidance includes three objectives regarding settlements and structures related to wetlands (pp.48-50):

O.1.3 –
To improve the sustainability of human settlements in relation to wetlands by increasing environmental and cultural awareness and reinforcing the traditional link between humans and nature

The actions suggested for implementing this objective are the following:

a) identify ‘interface areas’ between urban areas and wetlands;
b) determine the use of these interface areas for the benefit of local inhabitants and for the maintenance of the ecological character and of the ecological integrity of the wetlands;
c) provide, wherever appropriate, buffer zones between built areas and wetlands, for example by creation of urban parks; and
d) co-ordinate wetland management plans together with city planning tools and measures that affect surrounding areas.

The first objective (O.1.3), though quite general, seems appropriate in espousing a positive relationship between human settlements and wetlands. The proposed actions for its implementation, however, seem rather defensive. It would be preferable to promote the integration of the wetlands themselves into the urban fabric, so that they become key constituents of the settlement structure with, inter alia, a strong educational and recreation role.
A first step in this direction would be the clear, unequivocal and official delineation of such urban wetlands along with their core areas and buffer zones. This would help to guard against the expansion of urbanised areas at the expense of the ecosystem. Then potential conflicts should also be identified and addressed, especially with regard to land use and water resources management. It is clear that the management of urban wetlands must be fully integrated into urban planning at its various levels to achieve a harmonious use of space and resources.

Positive measures must also be taken to optimise the services that could be rendered by such wetlands through positive means such as enhanced accessibility with appropriate visitor management, the setting up and efficient running of visitor centres, education programmes and recreational activities that would promote both the natural and cultural heritage of the wetland. Efforts have already been made to combine cultural tourism development with wetland conservation in various parts of the Mediterranean, sometimes with considerable success. Examples such as Saintes-Maries-de-la-Mer in the Camargue, France, or Orbetello and Grado towns in central and northern Italy are referred to in this chapter.

O.1.3.1 –
To take carefully into account and protect ancient sites and structures (archaeological heritage) in, or closely associated with, wetlands

Six actions are suggested for achieving the above objective:

a) recognise ancient sites in the proximity of wetlands and collect information on their history, extent and significance from bibliographic sources and from responsible services and experts;
b) incorporate these sites in the management plans of the neighbouring wetlands;
c) ascertain whether the ancient sites can be incorporated in wetland visitor programmes;
d) identify ancient structures in or in the proximity of wetlands, especially those that were used for wetland-related activities;
e) promote archaeological research on these structures; and
f) include information on ancient structures and sites in wetland visitor centres and in related publicity materials.

The second objective (O.1.3.1) focuses on archaeological heritage in, or closely associated with, wetlands. It would thus appear to exclude such heritage whose sole relation to wetlands is proximity. Caution is needed here. As argued previously, the location of settlements was never accidental, but was due to the balancing of various considerations (such as security and proximity to valuable resources). It is therefore probable that, though it may not be evident to us today, wetlands have often played a role in the selection of a particular location. In this case, the archaeological research mentioned in suggested action (e) above should
focus on detecting and documenting such relationships, which in turn would enrich our understanding of the human uses of wetland resources.

Obviously, invaluable information could be provided by ancient structures used for wetland-related activities, which should be documented by careful archaeological and historical studies.

**O.1.3.2 – To protect characteristic/distinctive traditional and modern structures of cultural importance in or closely associated with wetlands**

The following actions may be required:

a) identify historical structures such as buildings and settlements, hydraulic works, transport systems, etc., located in wetlands or closely related to them, and compile inventories of them through description, photography and drawing, including recording their conservation status;

b) study the historical, architectural and technical characteristics of such structures, encouraging, where appropriate, schools of architecture to include work of this kind in their programmes;

c) consider assigning to these structures an appropriate protection status (such as ‘listing’), and thus preserving them from demolition;

d) develop projects and/or programmes for the long-term conservation of such structures, including their restoration, maintenance and purchase if necessary; and

e) if these structures cannot be restored to their initial use, consider converting them, where appropriate, into environmentally sustainable visitor centres, eco-museums, conference centres and/or hotels, with the aim of ensuring their maintenance, taking into account the sharing of benefits with local communities and other stakeholders.

One issue in the re-use of the historic buildings referred to in the third objective (O.1.3.2) is the need to balance an aim of restoring to original conditions – and thus the preservation of authenticity – with the desirable characteristics of environmental sustainability (such as thermal insulation, natural lighting, low energy construction and the use of sustainable materials).

Especially when carefully restored and with their functions historically documented, such buildings can become an essential part of visitor programmes and a source of local revenue, which could potentially cover their maintenance costs or even provide a profit.

A characteristic example of such use is the Salt Museum at the Sečovlje salinas in Slovenia, where a museum focusing on the salt-making process was established in the Fontanigge salina, an abandoned saltpan on the banks of the Giassi Channel, in the 1990s. Housing a wide collection of salt-making tools and two salt repositories, the museum serves educational purposes in the framework of eco-tourism.
Case studies

The case studies in this chapter examine a number of characteristic sites from around the Mediterranean basin in an attempt to illustrate the complex relations developed between humans and wetlands since the appearance of modern humans.

The archaeologist Theotokis Theodoulou describes why and how wetlands became essential for the support of life, the prosperity of human populations and the development of water-related technology. The prehistoric lakeside settlement of Dispilio in north-western Greece serves as an example and a source of inspiration for his article.

The ancient city of Vouthroto or Butrint in south-western Albania is a well known archaeological site which was a renowned World Heritage Site before also being designated a Ramsar Site. Its cultural values were thus a conservation priority before the protection of its natural values became an issue. The ex-director of nature conservation in Albania, Zamir Dedej, describes the conflicts and synergies between these two sets of values, and draws conclusions about how such conflicts can be resolved.

The Kune Vaini, or ‘Lezha wetlands’, in north-western Albania comprise one of the best-known sites in a country rich in history and natural values. Sajmir Beqiraj (a professor at the University of Tirana), analyses how the new ten-year management plan and the designation of part of the ancient city of Lezha as an Archaeological Park can contribute towards the more sustainable development of the area.

In Turkey, wetland expert Selim Erdoğan describes how all the country’s ancient settlements follow its hydrographic map and establishes the vital role of wetlands as sources of life and civilisation. The Dascylium and Obruk caravanserai are two of the many examples in this vast territory which, apart from being home to a significant number of ancient civilisations, also features a broad mix of the types of wetland defined by Ramsar.

Desilo (in Hutovo Blato, Bosnia and Herzegovina) and Narona (in the Neretva Delta, Croatia) are two significant Mediterranean wetlands which bear traces of the historical wealth of this Balkan region. Professor Jaroslav Vego describes the archaeological research conducted in the area over the past two decades and presents the most important findings.

Prespa Lakes1 were the venue for the Pan-Mediterranean workshop on the cultural values of wetlands which was jointly organised by the Society for the Protection of Prespa (SPP) and Med-INA in September 2009. Popi Nalpantidou provides an overview of the archaeological heritage of the area from prehistory into the post-Byzantine period. Due to its remote character and distance from Ottoman centres of authority, the region served as a refuge for a great number of monks, traces of whose activities can be found in abundance around the shores of the lakes.

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1 Editors’ note: the two Prespa Lakes are often referred to as ‘Mikri’ and ‘Megali’, or ‘Micro’ and ‘Megali’, or ‘Greater’ and ‘Lesser’ Prespa. For reasons of consistency we here refer throughout to ‘Greater’ and ‘Lesser’ Prespa.
Evolving relationships between people and water: archaeological evidence

Theotokis Theodoulou

Abstract

Water is one of the most essential ingredients of life. The places where it is present attract all living creatures, including human beings. This relationship between humans and water is testified to archaeologically from early prehistoric times. Areas with fresh water provided a series of advantages relating to food gathering, food production, an abundance of building materials, security, defence, easy communications and transport and were a source of inspiration for the development of the related technologies. Most of these conditions were also met near the seashore. This paper presents aspects of these relationships, using the Neolithic site of the Dispilio lakeside settlement as an example and a basis for discussion.

Keywords: Underwater archaeology, prehistoric archaeology, Neolithic sites, lakeside settlements, Dispilio

Introduction

Water is a generating source and vital ingredient of life. Springs, rivers and lakes have always attracted all living entities intent on satisfying their primary need for water, and in turn their food requirements. Archaeological evidence dating back to prehistoric times demonstrates this close relationship between humans and water. The very first human settlements were created near water sources, rivers or lakes, with proximity to fresh water determining the choice of site (Braudel, 1995). For example, in the Greater Prespa area (Albania, FYR of Macedonia and Greece), 74 prehistoric sites have been discovered to date, showing the dense use of these lakeshores since early times.

Water not only ensured fundamental support for life and moderated the microclimate, it also provided a series of advantages related to food gathering (hunting, fishing, fruit-gathering) and production (cultivation, grazing), abundant building materials for the construction of the first houses (mud, reeds, timber), security, defence, communication and transport (Touloumis, 2002) as well as to the development of knowledge and technology (boat building, navigation techniques, water mills, water saws, etc.). It is not a coincidence that civilisation itself was born in the valleys of great rivers such as the Tigris and Euphrates, the Nile and the Indus. In Albanian Prespa, a well-preserved section of a Middle Bronze Age
A wooden dugout came to light in 2007 dating back to the first half of the second millennium BC. The existence of this early dugout proves that the prehistoric settlers of the Coriçë e Vogel area could fish, travel and transport their goods along the waterways on similar boats (Lera, 2007).

Focusing on the case of the lakeside settlement of Dispilio on Lake Kastoria in western Macedonia (Greece), some examples are discussed below of evidence of the human-water relationship from the first Neolithic settlements into pre-modern times.

Fig 2.2 General view of the Dispilio Open Air Museum with its reconstruction of the lakeside settlement.

**Dispilio lakeside settlement**

The remains of the Dispilio settlement were discovered in 1932 by Antonios Keramopoulos, Professor of Archaeology at the University of Athens, who first recognised that these remains were evidence of the existence of a prehistoric settlement (Keramopoulos, 1932). The discovery centred on a number of timber poles and stone tools which made their appearance immediately after a fall in water levels that year. An excavation followed and confirmed the initial conclusions. In 1965, under similar circumstances, Professor Nicolaos Moutsopoulos of the Aristotle University of Thessaloniki recorded a large number of wooden poles and collected stone tools (Moutsopoulos, 1974). In 1992, a systematic excavation began at the same site directed by George Hourmouziadis, Professor of Prehistoric Archaeology at the same university (Hourmouziadis, 1996, 2002, 2008; Sofronidou, 2008 and Hourmouziadi et al., 2004). The settlement was dated to the Neolithic period, more specifically between 5600 and 4000 BC. In an attempt to visualise the results of the excavation and to create an open-air museum, a representation of part of the settlement with dwelling-huts on the lake and shore has been reconstructed a short distance from the initial excavation site (Hourmouziadi, 2002). This representation is very impressive, giving a scenographic impression of the site and its operation based on archaeological data.
Gathering – Hunting – Fishing

The settlement by the lake secured easier access to food sources through: a) the gathering of edible fruits, leaves, roots, eggs, etc.; b) the hunting of animals and birds, which either lived on the lake shores or came there to drink; c) the harvesting of fish and shellfish. The history of fruit gathering was evident through the remains of figs, wild pears, blackberries, hazelnuts and grapes (Magafa, 2002), while the history of hunting was demonstrated by remains of antlers and deer bones, as well as hunting tools and weapons such as stone arrowheads, slingshot projectiles and obsidian flint blades used for skinning and cutting up game and, later, domestic animals (Stratouli, 2002). Similarly, remains of shells, fish bones, fish hooks and fishing weights show the inhabitants’ involvement in fishing (Albatzi, 2002; Theodoropoulou, 2008). Fish spears and fishing baskets might also have been in the list, if they left archaeological traces. Remains of fish bones proving the early practice of open-sea fishing in Greece have been discovered in the Frachthi Cave in the north-eastern Peloponnese (Argolid); dating from the eighth millennium BC, they predate Dispilio. Here, too, there were obsidian blades, suggesting there was communication between Frachthi and the island of Melos 150 km away where obsidian was quarried (Renfrew and Aspinall, 1990). In the case of Dispilio, the diet of its residents included carp, roach, catfish, eels and shellfish.

Farming

The permanent Neolithic settlements by the fertile lake shores, where there was also abundant grazing, demonstrate the use of a combination of cultivation and stock raising. In Dispilio, among preserved seeds and plant fragments collected by the archaeologists were a series of recognisable cultivated crop varieties including wheat,
barley, oats, lentils, peas, beans, chick-peas and flax (Magafa, 2002), while stone pickaxes, sickles, stone-mills, grinding stones and traces of cereals on stone tools give evidence of farming practices. Agricultural productivity is also suggested by the existence of large ceramic storage vessels (Sofronidou, 2002). At the same time, bone fragments from sheep, goats, cattle, pigs and ducks suggest the use of livestock. The bones of sheep and goats and deer antlers are especially useful as they were converted into tools after the meat was consuming (Stratouli, 2002). An ox is depicted on a ceramic figurine used as a beast of burden (Hourmouziadis, 2002). Whatever the reason for its depiction, it is clear that the Dispilio settlers knew about and were able to use oxen to transport commodities and, presumably, for their meat.

Dwellings

While in the Palaeolithic period our nomad ancestors used caves as refuges and places of shelter, in Neolithic times settlements were established in areas offering easy access to fresh water. These areas often required and simultaneously favoured the building of houses. In Dispilio, excavations have revealed features of wooden and reed-made dwellings built on wooden poles over the water, as well as similar constructions built on the lakeshore. The rich forests which surrounded Lake Kastoria contained oak, pine, cedar, elm, lime, hazel, walnut, maple, alder and beech, while in the lake there were several types of aquatic plants and areas of reed-bed (Dinou, 2002). Most of these plant types, which have left traces, were used for the construction of the wooden house-frames, coverings for roofs and walls, fences, bridges connecting structures to the shore, etc. The use of reeds for wall-building is not evident in the archaeological record at Dispilio; the fact that reeds were used for the construction of walls in traditional pre-modern architecture, however, allows us to infer that they were also used in the Neolithic era. In addition, the sediment at the bottom and on the shores of the lake provided an abundant supply of mud for constructing walls, floors and perhaps also roofs (although there is archaeological evidence for its use for walls and floors, no evidence has yet come to light for its use in roof construction).

Safety

For more effective protection, the first builders constructed their houses in the water a short distance from the shore. This limited and controlled access, water being an obstacle for unwelcome visitors, wild animals and hostile tribes, and also protected the houses from the fires that were a constant threat to the surrounding woodlands. In the case of Dispilio, building in the water was gradually abandoned and people progressively started to build on the shore. This change

2 As reed is a material difficult to conserve in wet environments.
3 To a great extent, traditional techniques and materials used up to 50 years ago have their origins in the Neolithic era.
demonstrates the development of a sense of human dominance over animals during the Neolithic period, and possibly more peaceful relations with other groups living nearby. Evidence of wooden pole fencing has come to light in other lakeside settlements in Europe, including the settlements of Flag Fen and Glastonbury in Britain, Siedlung-Forschner and Wasserburg-Buchau in Germany and Fiavé in Italy. In Dispilio, there are no traces of fencing: building in the lake probably provided all the security that was necessary.

These fences were used for protection from all sorts of predatory animals, but were also important for defending a village against invaders. The elements of controlled access and difficulty of approach gave a considerable advantage to the defenders against any sort of assault. Furthermore, if the defences failed, the inhabitants of a lakeside settlement had the option of heading towards the centre of the lake or the opposite shore using any floating means at their disposal (dugouts, rafts etc.), which the mainland attackers, and of course animals, most possibly did not possess. The protection provided by water has been long appreciated. It is worth recalling the technique of constructing ditches and moats around Medieval castles, which controlled access in the same way and used water as a defensive element.

This calls to mind the famous oracle of Delphi and its advice to the Athenians before the Persian invasion: to use ‘wooden walls’ for the defence of their city-state. The Athenians understood that the oracle meant ships, which they went on to use with great success in war and peace.

Transport and communication

Prehistoric man soon overcame the inhibitory effect of water by transforming it into a route for travel through the invention of transport by boat. As mentioned above, the discovery of marine fish bones and obsidian blades from the island of Melos in Frachthi Cave date the invention of waterborne transport to as far back as the eighth millennium BC. In Dispilio, the remains of a dugout canoe were found during the first year of the excavation (Rouskas, 1995). This find, linked to that of a type of ‘boat-shaped’ bowl which was also discovered, and evidence of the use of weights for vertical fishing nets testify to the use of boats for fishing. The construction and use of such vessels required an advanced knowledge of naval technology, meaning ship construction and navigation. Even if the knowledge necessary to construct dugouts for the calm conditions of a lake was not sophisticated, it was an essential prerequisite. Bearing this in mind, it can be assumed that the various settlements located around Lake Kastoria could be connected by water.

Given that: a) water routes are easier and safer than overland ones for transporting people and cargo (as described in the myth of Theseus and the obstacles he encountered travelling overland from Troizen to Athens), b) agricultural productivity in Dispilio was suggested by the large storage vessels that have been
found, and c) the presence of raw materials from distant locations such as obsidian from Melos, Antiparos or Nisiros— all islands in the Aegean archipelago— it is easy to assume the existence of trade exchanges along water and sea routes.

On rivers, people, logs and other commodities were transported on inflated animal skins, rafts, dugouts and other types of canoe. The development from this to naval technologies leading to the construction of merchant and war ships bolstered the development of the great Mediterranean civilisations (Egyptian, Minoan, Phoenician, Greek, Roman and Byzantine). Lionel Casson notes:

‘One early step must have been from float to raft, from single log or bundle of reeds that would support one person to a platform that would support several. In wooded areas, it must have been the raft most of us know best, of bound logs. Along the Nile or amid the marshy lower stretches of the Tigris and Euphrates, regions of few trees but thick with reeds, rafts of reed bundles early came into use and, in the course of time, served as a stepping stone to an important form of boat, the reed canoe. Where particular geographical conditions or special requirements demanded something better, a more sophisticated form of raft came into being, the buoyed raft. In Mesopotamia, for example, the upper reaches of the Tigris and Euphrates with their swift waters and stony rapids would be death on any ordinary type. Here, in remote times, someone with imagination, observing his fellows crossing the river on inflated skins, figured out that, if one float could hold up one rider, a number of floats should be able to hold up a platform carrying several, and thereby invented the “kelek”, the raft made up of a wooden frame resting on multiple bladders.’ (Casson, 1995)
Consequently, the initial development of water technology was related to primitive naval technology and propulsion. The best-preserved remains testifying to these activities are to be found in the thousands of shipwrecks (Parker, 1992) which make the Mediterranean Sea the largest museum in the world.

There is no evidence for achievements as significant as those described above in Neolithic Dispilio. Water was, however, progressively used for other purposes. Humans grasped—and eventually managed to control—the power of running water and used it in watermills, for grinding cereals, nuts and seeds, for water saws etc. In Roman times (first century AD), people discovered the power of steam, as evinced by the devices invented by Heron of Alexandria. Subsequently, in a process of development over time, steam power would drive the machines, ships and trains of the industrial revolution in the seventeenth century. Water is now also used to produce energy, either in hydroelectric dams or through the power of waves and tides.

Finally...

The intense relationship between humans and water (and even the fact that water constitutes two-thirds of the human body) led, from prehistoric times on, to water lands being imbued with a mystical character. The flow of water, the essentially unknown nature of rivers and lake bottoms, the reduced visibility in wetland sites when surrounded by fog, the vigour of the waters, the wildness of seas and waterfalls, the calm of lakes and the unfamiliar species that live in the unknown depths plus the peculiar sounds and strange qualities of light gave birth to beliefs in nymphs, river gods, nereids, Poseidons, mermaids, fairies and elves. The need to appease these elements and for people and nature to coexist peacefully led to an association between water and ceremonies, sacrifices and other rites. In addition, all religions and spiritual traditions recognise water as a means of purification.

Studying the relationship of people and water through time, it is easy to appreciate the significant role of water, fresh or saline, in the development of civilisation and history. These conclusions, which are interpretations based on individual archaeological studies, seek to serve as a fruitful starting point for further discussion and investigation.

References


Building in Greek wetlands

The earliest mention of lacustrine dwellings was by Herodotus in relation to Lake Prasia. He describes the types of houses as follows:

‘… Platforms supported upon tall piles stand in the middle of the lake, which are approached from the land by a single narrow bridge. At first the piles which bear up the platforms were fixed in their places by the whole body of citizens, but since that time the custom which has prevailed about fixing them is this: They are brought from a hill called Orbelus and every man drives in three for each wife that he marries [...] and this is the way in which they live. Each has his own hut, wherein he dwells, upon one of the platforms, and each has also a trap door giving access to the lake beneath; and their wont is to tie their baby children by the foot with a string to save them from rolling into the water. They feed their horses and their other beasts upon fish, which abound in the lake to such a degree that a man has only to open his trap door and to let down a basket by a rope into the water, and then to wait a very short time, when he draws it up quite full of them.’

(Rider, 1964).

The lakes and swamps of Yannitsa (completely drained today) were the scene of guerrilla warfare between Greeks and Bulgarians in the early twentieth century. The cabins in the swamps were described thus by Delta (1937):

‘... These huts were built with reeds and poor quality wood, from the trees of the lake … A structure of piles driven in the bottom, in a long rectangular shape, was the foundation. Between the piles, stacked reeds and branches, resting on the bottom, but rising above the shallow waters, formed the ‘floor’. In the center, or towards one end of the floor, other posts were raised, and around them reeds woven with thatch and rushes formed the wall of the shack. The beams [...] supported a conical roof, covered also with reeds and thatch, so that the rain slides and does not inundate the interior. Where the water was deep, the ‘floor’ should be floating, that is dense and light [...] and at the same time solid to support the cabin and the men [...]. Around this primitive shelter, the ‘floor’ was extended [...] without a roof, open from all sides, where the fishermen would sit to rest, or fish or work [...].’


5 In the light of Herodotus’ geographical descriptions of the area, it has been argued that the lake refers to Lake Doirani, Achinos Lake or, most probably, Kerkini Lake, all of which are located in northern Greece.

6 In northern Greece.
In 1979, fishermen’s houses were still left in Messolongi:7

‘[…] at the shoreline, where the form of the settlement becomes indeterminate, where the houses are not built on the land, but travel on water, where an amphibian, pile-built gathering is born.’

The visiting architect describes the few fishermen’s houses (‘pelades’) left on the shore line of Messolongi, at Klissoura, Vassiladi, and Tourlida as architectural forms that date from the remote past.

‘Types of houses constructed of ephemeral materials […] from the neighbouring forests and the lake flora: timber, reeds, tamarisk bushes, rush and sea weeds. All of the plant scale from the hard and difficult to work to the flexible, malleable and easy to weave.’

He describes the construction further, which is based on wooden piles, plank floors, the roofs peaked and thatched, the walls of reed and mud, wooden slat parapets and always a roofed but open platform where the fishermen mend their nets (Vassiliadis, 1979).

The similarities of these three descriptions, so distant in time, are striking. And they document why the few remaining wetland dwellings of this type in Greece should be carefully preserved.

Delta, P. (1937), In the Secrets of the Swamps, Athens: Estia, pp. 48-49.


Vafiadis, L. (1940), Prespa and its Beauties, Athens.

7 In western Greece.


9 For a description of the development of traditional houses in Prespa, see Vafiadis (1940), p. 72-76.
Archaeology and nature conservation: from conflict to synergy in Butrint, Albania

Zamir Dedej

Abstract

Butrint National Park (BNP) is one of the best-organised and best-known national protected areas in Albania, as well as one of the country’s most famous cultural heritage sites and most extensively excavated archaeological sites. The area was recognised as a World Heritage Site (UNESCO) and later, in view of its biodiversity and natural values, designated a National Park. Initially, the main interventions and donor funding in the area focused on archaeological excavations and the cultural monument itself. Only in the last eight years has the biodiversity of the area and nature conservation begun to receive attention, bringing about a greater balance and synergy between the two approaches. Over the last few years, the organisation and management of the Butrint National Park has become more organised and structured, with a better balance between conservation actions for its natural and the cultural heritage (including the ancient city of Butrint). It is also manifest in the rising numbers of visitors (from Albania and abroad) and the increased possibilities offered to them by the Park.

Keywords: Butrint, archaeology, habitats, species, cultural heritage, positive example, management.

Background

Butrint is located on the southern Albanian coast, some 8 km south of the town of Saranda. It is part of the district of Vlora. The site is bounded by the border with Greece to the south and the Ionian Sea to the west. The core area consists of a tectonic 1600 ha lagoon known as Lake Butrint, which is connected to the sea via the Vivari channel and surrounded by forested hills and mountains as well as fresh water rivers/lakes and salt-marshes. The natural and cultural values of the site have led to Butrint’s recognition as one of the most important areas in Albania.

Cultural heritage

The Butrint area is famous for its archaeological monuments and its historical significance and cultural resources, most of which relate to the Greek, Roman, Byzantine, Venetian and Ottoman sites associated with the ancient city of Buthrotum. In
1948, following fifteen years of archaeological excavations (1928-1943), mostly by Italian archaeologists, the main site of Butrint was designated an Albanian Cultural Monument. In 1992, UNESCO approved the nomination of the main site as a World Heritage Site. Since then, the World Heritage Site has been extended to incorporate an area of 2500 ha (World Heritage Committee, 1999), and this larger area designated a National Archaeological Park (Council of Ministers, 2000). The Park covers a large section of the Vrina plain, Ksamil Peninsula, Lake Bufi, Alinura Lagoon, the saltwater and freshwater marshes and the southern part of Lake Butrint.

The entire area has been the subject of an intensive series of excavations attempting to bring to light and document the history of an extinct civilisation. The most important places of interest to visitors are (Andrews, 2001):

– **Butrint - main site**: dating from the Hellenistic and Roman period; over the last 80 years, only approximately 10% of the intramural area has been excavated.

– **Vrina Plain**: until recently an uninterpreted and relatively unknown part of Butrint; dominated by pasture lands, it offers distant views to the north across Lake Butrint and west to the island of Corfu.

– **Diaporit**: a Roman villa site located on the eastern shore of Lake Butrint.

– **Ali Pasha’s castle**: a nineteenth century fort, it guards the mouth of the Vivari, the channel connecting the lake to the sea.

– **Venetian Fortress**: opposite the entrance to the main site lies a Venetian fortress with internal barrack buildings.
Natural values

The area is one of the richest areas in Albania as far as natural resources are concerned. The area includes a high diversity of habitats:

– wetlands - seasonal swamp, seasonally flooded agricultural land, lagoon, estuarine waters and permanent shallow sea water
– oak forests (*Quercus ilex*) and Mediterranean *maquis*
– rocky marine coasts
– brackish and saline lakes
– rivers
– different habitats in the inland territory

The area of Butrint represents a large wetland complex set with lakes and dissected by two rivers: the Bistrica to the north and Pavllo to the south. To the east, Mile Mountain (824 m) separates the wetland complex from inland Albania. The area has an outstanding landscape value with a high variety of natural, semi-natural and artificial habitats. These include the brackish lake of Bufi (Rreza), the saltwater lagoon of Butrint, the salt marshes of Alinura, a rocky limestone coast, the outlets of the Bistrica and Pavllo rivers, the area around the Vivari channel, open halophytic vegetation and arable fields (Dedej and Bino, 2003).
This variety of habitats supports a large abundance and diversity of flora and fauna. Some 247 bird species — of which 70% are waterbirds, 10 amphibians, 25 reptiles and 39 mammals — are reported for the site (ASPBM, 2009). Fourteen taxa found in the area are registered as Globally Endangered (Dedej and Bino, 2003). The numbers of species at Butrint and the percentage these numbers form of the national totals for each taxonomic group are as follows:

<table>
<thead>
<tr>
<th>Taxonomic group</th>
<th>No of spp.</th>
<th>% of national total for each group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plants</td>
<td>800-900</td>
<td>27%</td>
</tr>
<tr>
<td>Fish</td>
<td>105</td>
<td>34%</td>
</tr>
<tr>
<td>Amphibians</td>
<td>10</td>
<td>67%</td>
</tr>
<tr>
<td>Reptiles</td>
<td>25</td>
<td>69%</td>
</tr>
<tr>
<td>Birds</td>
<td>247</td>
<td>75%</td>
</tr>
<tr>
<td>Mammals</td>
<td>39</td>
<td>60%</td>
</tr>
<tr>
<td>Total</td>
<td>2725-3325</td>
<td>17%</td>
</tr>
</tbody>
</table>

The tidal waters of Butrint are frequented by loggerhead turtles (Caretta caretta), dolphins (mainly bottlenose dolphins - Tursiops truncatus), while monk seals (Monachus monachus) may occasionally visit the area. The fresh and brackish waters of the wetland complex are inhabited by a number of species of conservation concern, including otters (Lutra lutra) (Dedej and Bino, 2003).
In 1999, 2900 ha including the ancient city of Butrint were designated a National Archaeological Park, and administrative staff were appointed. The Park was extended in November 2005 to produce a total area of 8591 ha. With strong support from local stakeholders, this extended area had a clear zoning scheme and more explicit environmental objectives. Prior to this, an area of 13 500 ha had been designated as Albania’s second Ramsar site in April 2003.

**Socio-economic importance**

The geographical location and excellent weather conditions provide opportunities for economic and social development for communities within this area. There are seven small villages in the area, belonging to three main communes: Qenurjo, Pllaka and Fanari (Aliko Commune); Shen Delli, Vrina, Xarra and Mursi in the south (Xarra Commune); and the larger village of Ksamil (Ksamil Commune) on the coast in the western part of the area. The largest urban areas are Ksamil and Xarra.

According to the Albanian Institute of Statistics (INSTAT), the population of the three main communes is 16 521, but according to the Saranda Civil Registration Office and/or the Communes records, the true number is larger (ASPBM, 2009). The difference may relate to those regarding themselves as belonging to the area but living abroad.

<table>
<thead>
<tr>
<th>Community</th>
<th>Registration office data</th>
<th>INSTAT data</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Aliko</td>
<td>1432</td>
<td>1325</td>
</tr>
<tr>
<td>2. Xarra</td>
<td>7312</td>
<td>6299</td>
</tr>
<tr>
<td>3. Ksamil</td>
<td>9600</td>
<td>8897</td>
</tr>
<tr>
<td>Total</td>
<td>18 344</td>
<td>16 521</td>
</tr>
</tbody>
</table>

The main economic activities of the local inhabitants are fishing, mussel farming, stock breeding, vine cultivation and cultural tourism. These activities are focused on the southern part of Lake Butrint.

At present, 150-200 of the families living in the commune of Xarre are employed in agriculture and stock breeding, while the current unemployment rate is estimated at 50% (ASPBM, 2009). Unemployment is lower in Aliko commune, due to an increase in agricultural and livestock activities combined with financial contributions from emigrants (ASPBM, 2009).

The situation in the Ksamil Commune is very different: the uncontrolled population movements to Ksamil from other regions and the destruction of agricultural systems mostly through the felling of fruit trees (mainly citrus varieties) have proved catastrophic (ASPBM, 2009). Due to the tourism potential of the area, there are efforts to seek employment in this sector, while women are mainly involved in foodstuff production and housekeeping.
Analysis of the situation

After reviewing the site and focusing on the two main elements -- its cultural and natural heritage -- in this section, an attempt will be made to examine a few points that would facilitate the analysis and evaluation of the Butrint NP and, more specifically, to investigate the relationship between cultural heritage and nature protection.

The area first became famous due to its cultural heritage, mainly in relation to the ancient city of Butrint and several other sites and the excavations made over a period of time. At that time (1992-1999), the responsible (cultural) institutions were against any designation of the site as a natural protected area, the application of nature protection categories, and the inclusion of the area as part of the protected areas network then being developed in the country. Moreover, no attempts were made to assess the biological diversity values of the area and the possible functionality of an integrated conservation management scheme was never examined. From this perspective, the protection of the site was linked exclusively to bodies responsible for its cultural heritage (Ministry of Culture, Institute of Archaeology and Institute of Cultural Monuments), and this was reflected in their unwillingness to consider any future co-operation in protecting the area based on anything other than its cultural values. This was considered as a primarily institutional conflict, though one that had repercussions on a range of institutional levels (local authorities, regional institutions, research institutions, etc.) as well as on the local community.

Being promoted as an archaeological site and managed mostly for its cultural heritage values, its natural and biodiversity values were not considered an additional value. Even the decision of the Council of Ministers in 2000 designating the area a National Archaeological Park characterised it as a National Park (an environmental category) for its archaeological values (as, at that time, no other protection category was included in the Albanian legislation), and restricted the area under protection to the environs of the ancient city of Butrint for exclusively cultural heritage purposes.

After 2000, the environmental dimension became more prominent, and relevant studies began to identify and call attention to the natural values of the site. In spite of the fact that Butrint Lake and its surrounding area were already recognised for their biodiversity values, this increased appreciation led to environmental institutions and civil society organisations beginning to take conservation and protection measures, organising actions and participating in the management of the site.

In due course, the donor community also began to show a greater interest in the environmental protection of the area. The designation of the Butrint National Park (BNP) as part of the protected areas network – of high conservation importance – under Albanian legislation (Law on Protected Areas, 2002), was supported by the culture sector. Butrint is the only example of a protected area in Albania that is managed by the Ministry of Culture, Tourism, Youth and Sport and not the environmental authorities.
BNP is widely recognised as a tourist destination for its archaeological and other cultural values, and is visited mainly during the summer months. The World Heritage Site represents the most important cultural site in the Saranda district and the most renowned archaeological site in Albania. It is visited by large numbers of tourists and other visitors. Butrint’s ancient city and other archaeological remains attract on average more than 20,000 visitors each year. The 2008 tourist season marked the highest number of visitors ever (58,000) and, as a consequence, the highest number of directly and indirectly employed people (about 60), thus providing financial support to the local economy (restaurants, hotels, etc.) of Saranda and Ksamil. The park is also included as a travel destination in the programmes of many travel agencies on Corfu and in Saranda (ASPBM, 2009).

Even though the biodiversity and landscape values of Butrint Park are not yet included on the travel agenda of most visitors, the increasing visitor numbers in recent times can be considered an indicator of interest in the Park’s environmental values as well as its archaeological heritage. Data shows a growing interest on the part of both national and international visitors in participating in activities related to the habitats and species native to Butrint. The Park managers have realised that biodiversity adds to the values of the archaeological site. Existing and potential activities include guided nature trails and treks, birdwatching, fishing, walking, cycling and sailing. The environmental perspective is now part of what draws visitors to the Park and helps to shape their itineraries once they are there. It is becoming clear that tourism has an important role to play in the area’s socio-economic development.

On the other hand, although the Park is becoming a tourist attraction, human capacities and management infrastructure—and thus service standards—are poorly developed (insufficient staff, equipment, information and panels, eco-guides, guided tours, hiking paths, bird watching hides, campsites, etc.). There is an evident need to extend tourism and leisure activities beyond the walls of the ancient town of Butrint, and to extend the tourist season beyond the summer months.

In the last three years, and as part of the obligations deriving from Butrint’s status as a UNESCO World Heritage site, a draft management plan has been drawn up for the area and presented to the relevant international institutions. At a national level, the draft was evaluated unfavourably as not engaging adequately with the environmental issues at stake. This prompted a revised version which integrates cultural and natural aspects in a closer and more interactive way, and recognises the environmental importance of a more extensive area than before.

Conclusions

The process of public consultation on the management plan, which included discussion of the respective roles of cultural and natural heritage protection in the area, brought some interesting material to light. According to inhabitants of Mursi and Xarrë (Xarra Commune), the BNP has had little influence on their villages, as they are situated towards the periphery of the Park. Regarding the ex-
pansion of the influence of BNP, the inhabitants of Vrina believe their socio-eco-
nomic situation has been negatively affected by the Park as a result of a claimed
loss of land ownership. Nonetheless, they believe that the BNP could contribute
far more to the economic development of the local community if tourism was bet-
ter organised, and if visitors were encouraged to stay longer in the areas beyond
the ancient town of Butrint. This could increase opportunities for local people to
sell their produce (food, honey, handicrafts, etc.) to visitors (ASPBM, 2009).

In the villages of the Aliko commune, local inhabitants consider their life to have
been very little influenced by the existence of the Butrint Park. This is mainly due
to the fact that most of those who count themselves as belonging to these villages
in fact now live overseas. The relative inaccessibility of these villages, given the
poor condition of the road network, is another factor (ASPBM, 2009).

The inhabitants of Ksamil declared that 95% of the socio-economic development of
their village is influenced by other activities and only 5% by the Park (ASPBM,
2009). However, a majority of the inhabitants share the opinion that, without the
BNP, the Ksamil area would resemble a ‘legless body’. This means that the future
development of the area is seen as being closely linked to the existence and man-
agement of Butrint National Park. Benefits would accrue to Ksamil from well-man-
aged and well-promoted year-round tourism and leisure activities in the Park area.

These opinions lead to an important conclusion regarding the integrated protect-
ed areas approach (for both natural and cultural heritage): if the area included un-
der conservation and/or protection does not bring benefits to the local population,
the conservation policy is unlikely to succeed. This is related to the need for insti-
tutional collaboration which avoids conflicts that impact negatively on the devel-
opment of the local community and on their interest in participating in the process.

In the Butrint example, we can see how useful the area’s resources, both natural and
cultural, may prove to be. The Butrint area is the ‘heart’ of the region, its most attrac-
tive part and the reason why most people choose to visit is its fascinating archaeo-
logical site and high biodiversity value. Most local stakeholders clearly believe that
increasing the site’s attractiveness can help expand the market for local goods and
services, so that the population living in the area may benefit from a direct income.

In spite of the progress made in protecting and managing the archaeological as-
sets of the BNP, there is increasing pressure throughout most of the Park from il-
legal building work; the dumping of debris along the road, lake and seashore; the
unsustainable development of marine aquaculture; overgrazing and uncon-
trolled grazing; illegal hunting, quarrying, fires and other threats.

From an analysis of the data and opinions concerning the natural and cultural
heritage in this area, it is apparent that:

– Butrint represents a unique site in the Mediterranean Region: a blend of cultur-
al and historic landscapes, it also supports a wide variety of habitats and spe-
cies and has outstanding landscape value;
– Butrint’s ancient city and surrounding areas represent one of the most important cultural heritage sites in Albania;
– Butrint supports species which are endangered nationally and internationally, and sustains a high proportion of the country's biodiversity, with particular importance for birds, reptiles, amphibians and mammals;
– as a key attraction to visitors to the region and a potential gateway to other sites of archaeological and natural interest in southern Albania, Butrint constitutes an important economic resource for more than 15 000 inhabitants, primarily in terms of tourism;
– Butrint is an educational resource for schools and the general public.

These elements form part of a mosaic that is in need of further definition and elaboration, but there are already sufficient indicators of Butrint’s significance as an interesting and positive example of the conservation of cultural and natural heritage being combined. The statutory authorities for both cultural and environmental affairs have a key role to play in this, as do the local communities in the area. There will be a number of challenges requiring their collective attention in the future, principal among which may be the challenges of administrative and financial capacity. Nonetheless, it is to be hoped that ways will be found to construct the effective mechanisms required.

![Figure 2.9 View of Butrint: the ancient city and Vivari channel.](image)

**References**


Archaeological heritage and nature conservation in the Kune-Vaini wetlands, Albania

Sajmir Beqiraj

Abstract

The wetland complex of Kune-Vaini, situated close to Lezha in north-western Albania, is well-known nationally and regionally for its natural and cultural values. Recent developments in the area are expected to make a positive contribution to the integrated conservation of these values. These include the preparation of a ten-year Management Plan (2009-2018) for the area, focusing on the conservation of biodiversity and restoration of habitats, encouraging economic activities that can generate important incomes for the community while being compatible with conservation objectives, and providing an appropriate institutional and legal framework. Other recent positive developments are directly related to cultural heritage, including the designation of the ancient part of Lezha as an Archaeological Park. Some tourist facilities have been enlarged and improved, and efforts are being made to reopen the local Ethnographic Museum. New archaeological findings are increasing the attraction of Lezha as a tourist destination. The town, together with the Kune-Vaini wetland area, is becoming an important site in the tourist packages of national and international agencies.

Keywords: Kune-Vaini wetland complex, nature conservation, archaeological and historical heritage

General characteristics and natural values of the Kune-Vaini wetland complex

Kune-Vaini is one of the most important wetland complexes in Albania. These wetlands are also known as the ‘Lezha wetlands’ after Lezha, the closest town to the wetland area. The complex is situated on the north-western coast of Albania, on the Adriatic Sea, and covers an area of 30 sq km, of which 12 sq km is open water and 18 sq km consists of swamps, reed-beds, forests, shrubs and cultivated land (Fig. 2.10). The main water bodies are the Kune Lagoon, Vaini Lagoon and Kenalla Marsh (Kabo, 1990-91).

Kune Lagoon (also known as Merxhani) has an open water area of 2.5 sq km, a maximum depth of 1.3 m and a mean depth of 0.75 m. It has a natural outlet
channel about 500 m long, 40-70 m wide and 1-2 m deep. Six artificial artesian wells with a mean flow of 5-6 l/s and a pumping station feed the system with fresh water. Water salinity in this lagoon varies from 20‰ to 36‰, while its pH is 7.57-8.25 (ECAT Tirana, 1998).

Vaini Lagoon has a total water area of 7.3 sq km, but is divided into two parts by a dam: Zaja Lagoon (the northern part) covers 2.4 sq km and Ceka Lagoon (the southern part) covers 4.9 sq km. Zaja communicates with the Drini River, while Ceka communicates with the Adriatic Sea. This lagoon has a maximum depth of 1.3 m, a mean depth of 0.7 m, water salinity of 9‰-23‰ and a pH of 7.65-8.76. Artesian wells with a total flow of 30-35 l/s and a pumping station with a flow of 30 cu m/s discharge into the lagoon (ECAT Tirana, 1998).

Kenalla Marsh, with an area of 2.24 sq km, is a meromictic ecosystem which is kept continuously well-fed by rich karstic springs, which are often submerged. Kenalla communicates with Kune (Merxhani) Lagoon through an artificial channel. Its mean depth is 4.2 m, maximum depth 13.5 m, mineralisation 5 g/l and the pH is 7.3-8.3 (ECAT Tirana, 1998).

In the whole wetland area, the minimum water temperature is 2°C-4°C, recorded in January, while the maximum water temperature is 25°C-30°C, recorded in July-August (Kabo, 1990-91; Miho et al., 2010).

Kune-Vaini was the first protected area in the history of nature protection in Albania, having been declared a Protected Hunting Reserve in 1940. Currently, it is a protected area with the status of a Habitat/Species Management Area (IUCN Category IV). Its most distinguished biodiversity features are: an important nesting habitat for birds, especially waterfowl; the presence of a typical alluvial mixed Mediterranean forest; very extensive reed-beds (Phragmites); and fish species diversity and
The flora of this wetland complex includes different types of vegetation: submerged, reedbeds, halophytes, psammophytes, aquatic shrubs and forest. The most notable habitats are: a 2 sq km alluvial mixed forest, dominated by alder (*Alnus glutinosa*) and narrow-leaved ash (*Fraxinus angustifolia*); very extensive reed-beds with *Phragmites australis*, *Typha angustifolia*, *Scirpus sp.*; lagoon bottoms covered by *Zostera noltii* and *Ruppia cirrhosa* seagrasses; sandy dunes with pioneer species, extending up to 10 km along the coast, with a width of 30-40 m and a height of 1-2 m. More than 270 species of higher plants have been reported from this area, of which 18 are internationally endangered species (Wager et al., 2006; Miho et al., 2010).

The Kune-Vaini wetland complex also has a rich faunal diversity. It fulfils the criteria for being a Special Protection Area (SPA) and an Important Bird Area (IBA). It is one of the most important bird sites in Albania, especially for waterfowl, although it has lost its status as the most important nesting site in Albania, which it had been until the early 1970s. According to recent assessments (ECAT Tirana, 1998; Beqiraj, 2004; Beqiraj and Koni, 2007) the species numbers for the main faunal groups in the Kune-Vaini wetland complex are: 61 molluscs, 59 crustaceans, 32 fish, 10 amphibians, 24 reptiles, 196 bird species and 23 mammals, although few studies have been done and the true number of animal species is probably higher than this. Of the 361 species reported in the area to date, 190 are included in the Albanian national Red List of Fauna (MEFWA, 2007) and 49 are included in the IUCN Red List (IUCN, 2007).

**Fig. 2.11** Aerial view of Lezha Castle.

**Archaeological, historic and cultural values**

The town of Lezha, known in ancient times as Lissus, is situated in the eastern part of the Kune-Vaini wetland complex. The fortress of Lissus (Fig. 2.11) dates from 385 BC and was founded by Dionysus of Syracuse. The area was populated
by ancient Illyrian tribes in the late Bronze Age and early Iron Age. Akrolisi Castle (Fig. 2.12) was the first settlement in Lezha. The old town was built in a very strategic position. Anna Komnena of Byzantium (twelfth century) wrote ‘Built in the air, this town can be seen from all sides’. The town was connected by the Drini River to the harbour of Nymphaeum (modern day Shengjin), situated 8 km to the west in the northern part of the wetland complex. Down the centuries, Lezha has been invaded by Greeks, Macedonians, Romans, Byzantines, Serbs, Venetians and Ottomans (Çelësi, 2006). Traces of several cultures can be seen in the ruins of the old town, such as the city walls, with a height of 6-8 m (built in 284 BC), 23 reinforcing towers with a height of 10-12 m, and 11 gates into the ancient town.

Being an important town in the past, Lezha is associated with several key dates in national history, such as the Franciscan Assembly (in the year 1240) founded by Saint Francis of Assisi, the League of Lezha¹⁰ (in 1444), the grave of Skanderbeg (1468) and the League of Arber¹¹ (1703). It is also known as the birthplace of many prominent Albanians in the fields of history, art and education.

Most of the villages in the area organise their own religious events (Christian and Islamic), and it has always been a tradition for the locals to exchange visits to each other’s villages to celebrate together. For many years, cultural events, including Mayday celebrations, have mostly taken place in the Hunting Lodge in the village of Ishull Lezhe and at Lezha Castle, both of which became pilgrimage sites for the local community. The main local and regional cultural events which are celebrated in common are: Summer Day (14 March), Novruz Day (22 March), Saint George’s Day (6 May), Saint John’s Day (24 June), Immigrants’ Day (15 August), Lezha Liberation Day (23 November), Buzmi Night (24 December) and the National Folk Festival of Rhapsodists (Çelësi, 2006).

The traditional economy is based on farming, stock-breeding, agro-industry, fishing, hunting, forestry, aquaculture, beach-based tourism and cultural tourism. Handicrafts produced in the Lezha area are well-known all over the country: these are mainly made from wool, wood, reeds, rushes and clay for ceramics. Local dresses, carpets, socks, shirts, curtains, sheets, covers, bags, straw mats, rush baskets, fish traps, fish nets, musical instruments etc. produced in Lezha are sold in Albanian markets and abroad. A workshop for local textiles and carpets, a pottery workshop and an exhibition of local products have been opened in the village of Blinisht.

Lezha has also a convenient geographical position, easily accessible by tourists. It lies 70 km from Tirana (the Albanian capital), 50 km from the national airport (Rinas), 8 km from Shengini Harbor, 70 km from Durresi (the main harbour in Albania), 40 km from Shkodra (one of the most important cities in Albania), and 50 km from the nearest border with Montenegro (Murriqan/Sukobina).

¹⁰ The League of Lezha and the League of Arber sought to organise the Albanians to fight against the Ottomans.
Promising developments for the integrated conservation of natural and cultural values

During 2006-2008, an Integrated Water and Ecosystems Management Project for Albania was implemented, which included the Lezha coastal area. The project was funded by a grant from the Global Environment Facility (GEF), which supported the improvement of municipal wastewater services in the coastal cities of Durrës, Lezha and Saranda. In support of global environmental goals, the project sought to improve the health and habitat condition of globally significant marine and coastal ecosystems along the coast of Albania in an integrated manner.

In relation to the Kune-Vaini area, the project aimed to: promote the establishment and improve the management of the Kune-Vaini protected marshland; support an integrated approach to ecosystem management based on the reduction of nutrients through the development and establishment of low-cost wastewater treatment technologies (Constructed Treatment Wetlands); improve the dialogue between public institutions and citizens through a public communication programme, as well as a programme of dissemination and replication of project achievements.

The improvements to the management plan of Kune-Vaini include:

– preparation of a 10-year Protected Area Management Plan for the period 2009-2018 (CEIA, 2009); a one-year operational work plan; a plan for multi-stakeholder participation in management of natural resources and economic incentives for long-term sustainability; and a process framework for adapting the management plans to changes in general conditions (e.g. legislation, policy changes, biological trends);

– implementation of selected priority measures identified in the Kune-Vaini Management Plan;
– programme for strengthening institutional capacity (definition of roles and responsibilities for the Kune-Vaini Administration, training in natural resources management, integrated ecosystem management, etc. for Kune-Vaini administration staff, rangers, relevant stakeholders, and for staff from other relevant authorities).

The main expectations of the Management Plan for the Kune-Vaini wetland complex (CEIA, 2009) are: conservation of biodiversity and restoration of habitats; stimulating economic activities that can generate important incomes for the community and are compatible with conservation efforts; and providing the institutional and legal framework to ensure appropriate developments in the area.

The Management Plan identifies 65 priority actions (as specific projects) aiming to improve the situation in the wetland area. The main objectives of these actions are related to:

– the improvement of environmental conditions to levels that will ensure the natural ecological equilibrium;
– the restoration of the area’s biological diversity to a level that would allow the site to be considered among the most important wetlands in the Mediterranean;
– ensuring a higher quality of life for the local community through the sustainable use of natural resources, and acting as a positive case study for use in other similar Mediterranean protected areas;
– enhancing the promotion of the area’s cultural and heritage values;
– increasing public awareness and local community participation in the conservation of the site and its management;
– strengthening the institutional and legal framework for protected area management, spatial planning, assessment and monitoring of the ecological status of the site and the impacts of development;
– establishing a specific site as a focus for educational and recreational purposes.

Fig. 2.13 The main gate of the ancient town of Lissus.
The Institute of Urban Studies has also prepared a regulatory plan for the Tale – Shengjini coastal area, which includes the coastal part of Kune-Vaini. This plan has been approved very recently, and its implementation has not yet started.

Regarding cultural aspects, the ancient part of Lezha – which includes the castle, the walls of the ancient town (Fig. 2.13), Akrolisi and the Skanderbeg memorial – has recently been designated an Archaeological Park (Fig. 2.14). Funding has recently been allocated for rehabilitation work on the castle and city walls. A small souvenir shop has been opened at the main entrance of the Skanderbeg memorial offering local traditional art and craft products to visitors. A small photographic exhibition has also been established at the memorial which documents the natural, cultural and historic development of Lezha over the past two hundred years with photographs dating from 1834.

Efforts are being made to reopen the Lezha Ethnographic Museum which was closed in 1992 as a result of damage to the building. The existing collection, highly valued for its traditional and cultural content, has been stored and preserved in good condition and is available for re-exhibition if the Museum reopens. The ethnographic collection could also be continually enriched with traditional handicrafts from the Lezha villages. Although there is a lack of good management and quality control for the production of these handicrafts, they can still be of importance for the local economy and cultural values, especially if they were marketed in a more organised way.

Several strands of archaeological research are being carried out in Lezha old town by the Albanian Archaeological Institute and the Institute of Cultural Monuments in collaboration with foreign research institutes and universities. Research concerning antiquity is mostly focused on Akrolisi, while that concerning the medieval period is focused on the castle of Lezha. In the course of this research, a baptistery from the sixth century AD and a mosaic from the first or second centuries BC have been discovered.

Fig. 2.14 Skanderbeg Memorial - interior view.
The importance of Lezha old town as a tourist destination has increased in recent times. Except for the Skanderbeg memorial, which has an average of 10 000-14 000 visitors per year, it is difficult to make any estimate of the numbers of visitors to the other parts of the old town, since entry is not controlled. It is clear, however, that the number of foreign visitors, most of whom are daytrippers from Tirana, Shkodra and Montenegro, is on the increase. Most visits are made between April and October.

Visits by schools (at different levels) and universities are also increasing in the context of teaching programmes relating to history, archaeology and ethnography, as well as for tourism. Summer tourists who spend their holidays at the beach, mostly in Shengjini, are increasingly visiting the old town of Lezha on day trips.

**Particularly important cultural activities in the Kune-Vaini area**

To summarise the information above, the cultural activities of particular importance to the Kune-Vaini area relate to:
- visits to the archaeological park of Lezha (castle, city walls, Akrolisi and Skanderbeg memorial);
- promotion of ethnographic values and handicrafts.

One aspect of the importance of these activities is that they integrate history, culture, religion, art, economy, development and many other aspects of the local community of the area. Together, these elements embody the characteristics of this community and its natural resources, including the links to wetland habitats.

If managed appropriately, these activities can play an important role in the sustainable development of the local community, as well as in the conservation of natural values, promotion and good management of the Kune-Vaini wetland area. These activities bring benefits and generate incomes for both the community and administrative authorities of the protected area through visitor and tourism activities in the region, and also provide a market for local handicrafts and other traditional products.

**Negative impact of other developments in the Kune-Vaini wetlands**

Despite the positive developments detailed above, there have been others with a more negative impact on the area. A flood-wall in the southern part of the Drini River mouth was built in 2007 and another is planned for the northern part. The embankment extends approximately 150 m into the sea, parallel to the river banks. According to the Lezha Drainage Board, which approved the construction, this
will help to prevent flooding of the Lezha area from the Drini River by reducing the pressure of seawater around the river mouth and allowing the river to discharge more easily into the sea. Most environmentalists are opposed to this development and disagree with its theoretical premise, believing the embankment will not prevent flooding and that, moreover, it will have a negative impact by altering the linkage between the Drini River and the northern part of Vaini Lagoon (Zaja). This threatens to impact on the lagoon’s entire water regime. Furthermore, the existing flood-wall in the southern part of the river mouth has changed the wave regime on the coast and caused erosion in the northern part of the river mouth.

Some years ago, an accidental explosion at oil tanks in the Kenalla area owned by a private company resulted in an oil leakage that caused severe pollution in the lagoon. The environmental impact of this has not been properly assessed, and no clean-up has taken place. In addition, there are proposals to construct a thermoelectric power station and an industrial park at Kenalla. These proposals conflict with objectives in the National Biodiversity Strategy and Action Plan (NEA/AKM, 1999), which proposes strengthening the protection of the Kenalla wetland.

Other pressures relate to the fishery in Kune-Vaini Lagoon. As of 2010, nine enterprises employing a total of around 50 fishermen have been licensed to fish in the lagoon. In the view of local environmentalists, the number of fishermen is too high and results in overfishing of the lagoon (even without taking into account any impact of illegal fishing). Most of these licensed companies have fenced off their fishing areas with fixed permanent nets, which have a negative impact on fish movements and on migration. Although fishing in the lagoon and coastal waters is an old tradition in this area, annual fish yields in recent years are considered insufficient to meet the economic needs of the local community and market demand. Currently, even for fishermen’s families, revenues from fishing are secondary to revenues from agriculture, farming, handicrafts, commerce and employment away from the area (emigration).

The use of fish traps known as stavnik is spreading rapidly in the coastal waters of the Kune-Vaini area. Most of these are illegal and are set for long periods, causing negative impacts on fish, sea turtles and other shallow-water marine animals.

In relation to cultural aspects, although there have been recent positive developments, investment and support from central and local governments for strengthening cultural activities is still very limited. Proper administrative and management structures for the Archaeological Park have not yet been established. The overlapping of competencies between the local government and the Institute of Cultural Monuments with regard to some management aspects (Ministry of Tourism, Youth and Sport) causes confusion.

Transport infrastructure remains a problem for the area. The road leading to the castle and the old walls is still in bad condition. Much illegal and uncontrolled
building work has taken place in the old town, some of it close to important historical and archaeological features.

In the opinion of local experts, there is an urgent and increasing need to provide financial support for maintaining and improving the infrastructure and expanding the qualified staff of the Lezha Archaeological Park, and for establishing a combined Historical, Archaeological and Ethnographic Museum in the town.

References


Archaeological sites and historic buildings in Turkish wetlands

Selim Erdoğan

Abstract
Turkey, with its varied geography and climate, has many different types of wetlands. Almost all of the wetland types defined under the Ramsar Convention can be seen in the country. Throughout history, wetlands were home to civilisations. From the ancient civilisations of the Indus Valley, Mesopotamia and the Roman Empire to today’s contemporary settlements across the world, proximity to a water source is a controlling factor for human life. In Turkey, the distribution of ancient settlements follows the hydrographic map of the country. Archaeological excavations prove that water and wetlands were integral components of historical sites. Two of the numerous examples are studied in detail: Dascylium and Obruk Caravanserai.

Keywords: Archaeological sites, wetlands, Turkey, Dascylium, Obruk Caravanserai

Introduction
Mankind established permanent settlements about 10 000 years ago, when people adopted an agrarian way of life. This new type of livelihood spread everywhere and the global population began to expand faster than ever before. Sedentary agricultural life made it possible to construct villages, cities and eventually states, all of which were highly dependent on water. This created a new relationship between humans and water. Since pathogens transmitted by contaminated water became a very serious health risk, guaranteeing pure water became a prerequisite for successful urbanisation and state formation (Vuorinen et al., 2007).

In ancient Mesopotamia, cities of early civilisations such as Sumer and Akkud had canals connected to the Fırat (Euphrates) River, or a major stream for both navigation and water supply for daily uses (Mays, 2007). Being close to a waterway was a significant advantage for cities, since it increased their access to trade routes, and thus to wealth and power. Water-related innovations in agriculture, sanitation and science triggered a socio-economic dynamism. The earliest powerful states appeared in Egypt, Mesopotamia, India’s Indus Valley and China due to the need for a powerful central authority to manage their ex-
tensive water systems. These states were also called ‘hydraulic civilisations’ (Ozis et al., 2005).

The perception of wetlands differs from that of other types of water resource. Although wetlands were considered in a negative light as sources of disease and hence obstacles to any form of positive development, the floodplains of rivers and the areas around other wetlands are considered the cradle of human civilisation (Matthews, 1993). People lived in these areas, building settlements, exploiting the natural resources and even altering the habitat according to their needs (Papayannis et al., 2002). The Harappa and Moenjadoro sites in the Indus Valley and Egyptian sites around the Nile Delta are perhaps the earliest examples of this.

**Wetlands and archaeological sites in Turkey**

In addition to their use for basic human needs, many wetlands have provided the physical and spiritual background for important civilisations (ibid). In Anatolia, too, where innumerable civilisations emerged throughout history, water gave life to various societies and created a unique cultural richness. Many beliefs found their way into this land and their respective rituals were practised. In some of these rituals, water was regarded as sacred and linked with power, fertility and well-being (Terzi, 2004). Lake Golmarmara in western Turkey, for example, was believed by the Lydians to be sacred (Başgelen, 2005). Similarly, Lake Van was ‘the holy lake’ for the Urartians.

Turkey is a country rich in remarkable treasures, including the remnants of 13 successive civilisations spanning 10 000 years. Geographically known as Anatolia, it has witnessed the rise and fall of many great civilisations, including the Hittite, Lydian, Greek, Achaemenid, Hellenistic, Roman, Byzantine, Seljuk and Ottoman.

Every period of Anatolian history has been influenced by different cultures. During the 9000 years of Anatolian history, several cultures have affected the urban structure of the area (Topçu and Kubat, 2007). As the source of many rivers such as the Kizilirmak, Aras, Gediz, Sakarya, Fırat (Euphrates) and Dicle (Tigris), Anatolia displays evidence of the early attempts these cultures made at hydraulic management to provide drinking water and irrigation for their settlements (Terzi, 2004). Table 2.1 lists some well-known archaeological sites and the wetlands near which they are situated.

The history and architecture of well-known sites which are popular tourist destinations, such as Aspendos and Pergamon, have been well documented by various authors. In this chapter, two lesser-known examples of other archaeological sites and their relationship to neighbouring wetland ecosystems are described.
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Table 2.1: Examples of archaeological sites in Turkey and their neighbouring wetlands.

Lake Manyas and Dascylium

Lake Manyas is one of 13 Wetlands of International Importance in Turkey currently (2010) listed under the Ramsar Convention. The lake is situated on one of the four main migratory routes of birds of the western palearctic region, and this fact gives a distinctive character to the lake. Significant numbers of waterfowl breed and win-
ter in habitats such as flooded areas of willow and in extensive reed-beds. A representative part of this ecosystem was declared a National Park in 1959 (Bird Paradise National Park). The boundaries of the National Park were later extended to cover the entire lake. This was followed by the declaration of the entire lake as a Ramsar Site in 1994. The National Park was awarded the European Diploma for Protected Areas by the Council of Europe in 1976 (Magnin and Yarar, 1997).

The lake shore provides valuable habitats (reed-beds, flooded meadows, willows) for waterfowl, but also for other aquatic biota. In terms of biodiversity, the most important parts of the lake are the Sığırçı and Kocaçay deltas, where the main inflow streams enter the lake. In winter, there is high rainfall in the vicinity of the lake. Snow-melt from the mountainous areas surrounding it floods the willow woods in the spring (Erdem, 1995). The willow trees are important for breeding birds, as they provide a refuge from predators. By mid-summer, these temporary parts of the lake have become dry land again as the water recedes. These seasonal fluctuations are fundamental to the biological richness of Lake Manyas.

This shallow freshwater lake was a bird paradise for ancient civilisations, too. During the rule of the Achaemenids, it was such an important settlement that its governor was appointed from members of the ruling dynasty.

Dascylium was a city founded by Dascylus, who left Lydian Sardis and came to the north in the seventh century BC. The place that he chose was a small hill, 30 km south of Bandırma, on the south-eastern shore of Lake Manyas. It was named after Dascylus’ son, Gyges, who was born there. Gyges was later recalled to Sardis and became King of the Lydians. Authors throughout history have told different stories about Gyges’ rise to power, but the point on which historical consensus has been established is that following Gyges’ coronation, he honoured his father by naming this city Dascylium, or ‘the place of Dascylus’, after him (Bakır, 2003).
In fact, it was not the Lydian Dascylus who founded this settlement. Although some ancient sources state that a village was founded by a group of Aeolians in the twelfth century BC, surface findings here indicate that the site had been settled much earlier, as long ago as Chalcolithic times. Remains of the much older palace in which the Lydian King Dascylus once lived have also been unearthed. Three burnt levels have been uncovered in this palace built of mudbrick walls on stone foundations. The destruction of the palace seems to coincide with the story of the horrific Cimmerian Invasion. This refers to a disastrous overrunning of all western Anatolia by tribes of barbarians (Cimmerians) from the north during the seventh century BC. Cities were sacked and burnt and the inhabitants terrorised (MoCT, 2008).

The Persians (the Achaemenids) started to move through Anatolia in 546 BC, setting up satrapies in four separate regions as they progressed. According to the findings of archaeologist Dr. Kaan Iren, the Persians captured Dascylium in the mid sixth century BC. Following the destruction of the Lydian city, the Persians re-established Dascylium as one of these satrapies (Iren, 2010). The city was very impressive, with the natural beauty of Lake Manyas (ancient name Lake Dascylitis) stretching towards the sunset. Satraps assigned from the imperial dynasty lived splendidly here in the style of the Persian kings. The impressive Paradeisos (nowadays the Bird of Paradise National Park) was an important feature in their luxurious lives (MoCT, 2008).

Among the excavated layers corresponding to the Achaemenid period, in situ archaeological findings have included the bones of many fish and birds as well as a large quantity of mussel shells. Tools and bronze fishhooks large and small are important evidence of socio-economical interaction between humans and the wetland at that time (ibid).

Paradeisos and the city of Dascylium were two complementary concepts intrinsically related to both the natural and the historical environment (Fig. 2.15). Both because of the natural beauty of the area and its strategic geopolitical location on the south-eastern shore of the lake, the area became a strategic settlement. Bakır (2003) writes that Paradeisos (Lake Manyas) was described by Xenophon in Hellenica thus;

‘Agesilaus, who had not failed to note the king’s impatience, at once fitted out a ship of war and gave orders to Callias, a Lacedaemonian, to escort the maiden to her new home; after which he himself began his march on Dascylium. Here was the palace of Pharnabazus. It lay in the midst of abundant supplies. Here, too, were most fair hunting grounds, offering the hunter choice between enclosed parks and a wide expanse of field and fell; and all around there flowed a river full of fish of every sort; and for the sportsman versed in fowling, winged game in abundance’.

Similarly, the Persian King Pharnabazos expresses his sorrow when he saw his city destroyed by Spartans with these words: ‘The beautiful palaces which my
father left me as an heirloom, the parks full of trees and beasts of the chase in which my heart rejoiced, lie before my eyes hacked to pieces, burnt to ashes’ (Bickers and Widger, 2008).

When, in 334 BC, Alexander the Great decided to put an end to Persian rule, one of his dreams was to take control of the famous city and its environs. According to de la Gravière (1883), Alexander was welcomed by the inhabitants as a liberator. Following the conquest of the Macedonians, Alexander did not end his march but continued eastwards in search of his destiny. However, Dascylium maintained its geopolitical significance and remained an important settlement after the fall of the Persian kingdom.

Dascylium thus preserved her fortress and settlement throughout every period; from Phrygian and Lydian times throughout Achaemenid and Macedonian rule and even into Byzantine times, the city continued to be well-planned and strongly fortified, its command entrusted only to the most outstanding administrators (MoCT, 2008). When Ottoman forerunners arrived in southern Marmara in the late thirteenth century, the Byzantine emperor gave his commanders the mission of strengthening their fortresses. Then the commander of the Bandırma region accomplished this command by removing available hewn stones from the city walls of Dascylium, which were less important than his own fortresses. This is why archeological excavations have revealed missing layers in the upper strata of the settlement. This can be taken as proof of the decreasing value of the city. Following the institution of Ottoman rule, Dascylium lost all importance and the majority of the human occupants of the area around the Lake moved to small villages.

In addition, some ambiguities can easily be found in the chronology between Alexander the Great and the Byzantine period. The absence of archaeological finds from the Roman era indicate an abrupt interruption in socio-economic activities. The city losing its status as the capital of the satrapy could explain these missing historical records. Researchers have tried to find a reason for this sudden change. One of the most popular scenarios is the effect of a major earthquake followed by a tsunami which resulted in the loss of arable lands.

According to Leroy et al. (2002), Ostracod valves, which are usually not preserved in Lake Manyas’ sediments, are either incorporated here as tsunami debris (providing a spatially-averaged snapshot of the regional assemblage) or are locally preserved following a temporary geochemical/hydrochemical change of unknown duration in the water. They believe these marine shells are evidence of a sudden sea water incursion: this sudden movement could have been the result of a tsunami. On the other hand, according to Altınok and Ersoy (2000), paleotsunami records do not provide enough data for the southern Marmara region, since they are focused on eastern and northern parts of the Marmara region. They point out that there is little tsunami information for the Lake Manyas area and view this scenario as unlikely.
The murkiest part of Dascylium’s history matches these dates. This cannot be directly explained by a causal connection, and the details need further investigation. Collaboration between archaeologists and geologists needs to be supported by socio-economic interpretation in order to understand the fluctuations in the inhabitants’ living standards. In 2008, the paleotsunami theory caused great excitement among the excavation team.

Initial archaeological investigations were begun by Kurt Bittel who identified the site as the city of Dascylium from epigraphic evidence. Excavations were first undertaken in 1952 by Professor Ekrem Akurgal, who worked at the site until 1960. In 1980, Professor Tomris Bakır restarted excavations (Bakır, 2003). Following her retirement in 2008, Dr. Kaan Iren took charge of the excavations.

The archaeologists have all focused their interpretations on the question ‘Why did Dascylium lose its importance?’. Although some researchers disagree with the tsunami theory, a natural disaster hypothesis of some kind is gaining ground.

These findings prove that the archaeological efforts have to be linked with geological data and evaluated by reference to sociological perspectives (Fig. 2.16). The real history can only be written when the separate stories of Man and nature have been integrated. Trends towards this more integrative direction can only benefit the assessment of the cultural aspects of wetlands in Turkey.

**Kızören Obruk and Obruk Caravanserai**

Anatolia has always played an intermediary role between East and West. Important trade routes developed along the secure and effective road system constructed over several successive periods. The eras of the Seljuk and Ottoman empires stand out as times of prosperity in which Anatolia was provided with a well-
functioning road system, solid and well-designed stone bridges, majestic caravanserais, hospitals, schools and observatories. Seljuk monuments, decorated with fascinating architectural ornamentation, still number among the finest works of art on the Anatolian peninsula (Akurgal, 1980; Topçu and Kubat, 2007). Obruk Caravanserai is a significant and well-preserved example of these structures.

Kızören Obruk is a karstic wetland ecosystem which was designated a Ramsar Site in 2007. It is situated approximately at the midpoint of the Konya-Aksaray highway. The site is in the Konya district. Since its designation as a Ramsar Site, the management has been undertaken by the Ministry of Environment and Forestry.

Obruks are special forms of dolines. Gunn (2003) defines a doline as a natural enclosed depression found in karst landscapes. The term doline refers to depressions having diameters larger than their depth. Dolines are characteristic structures in terrains underlain by karstified carbonate rocks, and are widespread on evaporite rocks (Sweeting, 1973).

Dolines have been classified by Ford and Williams (1989) into solution, collapse, alluvial and subsidence dolines. Waltham and Fookes (2005) developed this classification and identified six groups of dolines (Fig. 2.17). However, karst is a dynamic phenomenon and in some cases exceptional features can be seen. Obruks constitute an example of such exceptional karst features. Although Doğan (2004) identifies obruks as collapsed dolines and neglects all other geochemical factors, a geological-hydrogeochemical approach differentiates obruks from dolines.
Karstification, which leads to the formation of such suitable cavities in the limestone, is controlled by three main factors: the lithology, the tectonic history and the hydrochemistry. The hydrochemistry is often neglected when it is the mechanical process that is at issue. However, in the case of Kızören Obruk, it can be regarded as the dominant influence.

The apparent lithology of the region consists of carbonate rocks (limestone, clayey limestone and marl) of the Miocene-Pliocene era (approximately ten million years old). Some volcano-sedimentary sequences are also present in the uppermost layers of these formations. A Quaternary alluvial cover overlies them all (Göçmez et al., 2001). Tertiary carbonates on which all these obruks are formed have horizontal strata, which reflects the fact that Tertiary and younger geological units have retained their original position without major tectonic movement.

According to Günay et al. (1995), almost all obruks developed in Tertiary lacustrine carbonate substrates. Tertiary limestone hosting more than 60 obruks extends over an area of about 120 sq km between Kızören and Karapınar which is known as Obruk Plateau. In a steppe environment where water is of vital importance, this wetland ecosystem gives life not only to humankind and waterfowl alike. In Kızören Obruk, groundwater can be observed flowing from northwest to southeast through an underground karst conduit (Erdoğan, 2004).
In fact, solid limestone does not dissolve easily, and the Tertiary limestone in the region would not have been expected to be karstified to the degree that it has. Güney et al. (1995) emphasise this and express the opinion that the volcanic CO₂ which was deposited by Plio-Quaternary volcanic activity and dissolved in the groundwater has played an important role in enhancing the karstification process.

Kızören Obruk was an important stop on the historical Silk Road (Figure 2.18). The historical building known as the Obruk Caravanserai was initially constructed to police this commercial road. Archaeological finds and some written sources prove that the Obruk Caravanserai was established in the thirteenth century AD. According to Özcan (2006), the denomination of the Caravanserai as a ‘camp’ or ‘range’ in Seljuk sources is evidence that it was established primarily for this reason. The intensity of commercial activity on the road, however, led to a change in use, and in time the camp became a caravanserai.

Özcan (2006) emphasizes that two main axes were very active as commercial roads. The first axis on which the Obruk Caravanserai was built began at Alanya and led towards Iran, passing through Obruk. The locations of the caravanserais were determined by the travelling capacities of the caravans, which is calculated to have been approximately 35-40 km/day (Özcan, 2006). The distance between Obruk Caravanserai and Sultanhanı (the nearest caravanserai to the east) supports this conclusion.

It is obvious that the choice of location was made by taking the Kızören Obruk into consideration as the nearest water source. But the mystery is how a hidden feature of this sort was found on a flat steppe where it would have been impossible to discern anything that did not rise more than a metre above the surface. One possible reason for the discovery of the Obruk may have been the visible presence of waterfowl.

Fig. 2.19 Obruk Caravanserai (before restoration works, 2004).
The Caravanserai maintained its commercially strategic importance during Ottoman rule and until the end of the seventeenth century, because of its closeness to Konya, the capital of the Seljuk empire. The reduction in caravan activity, however, led to a decline in the significance of the Obruk Caravanserai. When mediaeval commercial traditions began to change following the Industrial Revolution, the activity previously associated with the caravan route moved elsewhere, and the users of the Obruk Caravanserai left the area. A small village has remained in the area as a historical reminder (Fig. 2.19).

In 2005, the Ministry of Environment and Forestry designated Kızören Obruk a Ramsar Site. Following this decision, the site’s isolation came to an end and some activities re-commenced. With the support of the Ministry of Culture and Tourism, the road began to turn into an important tourist route. In the future, more will need to be done to highlight the cultural aspects of Kızören Obruk through the restoration of the Obruk Caravanserai.

In 2007, the General Directorate of Foundations, which is the legal owner of the Caravanserai, announced on its website that it had initiated a restoration program. By the end of August 2009, almost half of the restoration work was complete (Fig. 2.20). Outer walls have been renovated and arcs and pillars reconstructed. Every day, the caravanserai reveals more of its former splendour. Following the completion of this restoration programme, relevant bodies (the General Directorate of Nature Conservation and National Parks, the General Directorate of Cultural Heritage and Museums and the General Directorate of Foundations) will decide on the use to which the restored Caravanserai will be put (museum, visitor centre, hotel, etc.).
References


Archaeological interests in two wetland sites: Desilo, Hutovo Blato, Bosnia & Herzegovina, and Narona, Neretva Delta, Croatia

Jaroslav Vego

Abstract
The transboundary valley of the Lower Neretva River contains the largest and most valuable remnants of Mediterranean wetlands on the eastern Adriatic coast: the Ramsar sites Hutovo Blato (in Bosnia and Herzegovina) and Neretva Delta (in Croatia). Over the past two decades, a permanent archaeological collection from the wider area has been set up featuring the remnants of Illyrian ships, an early Christian basilica, a suburban Roman villa, the ancient walls of the town of Narona and the Roman temple of Augusteum. This paper presents an overview of archaeological research activities relating to the two Ramsar sites.

Keywords: Wetland sites, archaeology, Hutovo Blato, Neretva Delta

The transboundary Neretva River, and the importance of its wetland ecosystems

The Neretva River forces its way through the Dinaric Alps to spread downstream and to flow through its large delta into the Adriatic Sea. The Lower Neretva valley contains the largest and most valuable remnants of Mediterranean wetlands on the eastern Adriatic coast, and is one of the few areas of this kind remaining in Europe. The valley spreads abruptly into an alluvial fan covering an area of 20 000 hectares. Its upper part, known as Hutovo Blato, is in Herzegovina, while its lower part is situated in the Republic of Croatia, with the river branching into a large delta.

Hutovo Blato Nature Park covers about 8 000 ha of the Neretva Valley in Herzegovina. Across it flows the Krupa River, a tributary of the Neretva. This river, together with groundwater from the adjacent karst area, is responsible for the overall water regime and, consequently, for the general conditions of life in this wetland ecological system. The topography, climate, vegetation and abundant water create favourable habitat conditions here throughout the year for large numbers of plants and animals, especially birds. Hutovo Blato is important for wintering ducks and waders from northern Europe and for breeding species, including threatened ones. In 2001, this unique area was designated a Ramsar Site, the first one in Bosnia and Herzegovina.
The Neretva Delta includes five protected sites with a total area of 1620 ha. These include several ornithological and ichthyological reserves as well as protected landscapes. A proposal has been tabled to make the Neretva Delta area a Nature Park.

Remains of Illyrian ships found in Lake Desilo, Hutovo Blato

A limestone ridge divides Hutovo Blato into upper and lower zones.

There are six lakes in the upper zone, one of which is Lake Desilo. In late March 2007, a team of archaeologists uncovered what they believed were remains of Illyrian ships eight metres below the surface of the water. The first of these measured fourteen metres long by four metres wide. They are the first Illyrian ships ever discovered and they date back 2000 years.

Fragments of a number of amphorae were found on the ships; thirty of these bear the marks of the artisans who made them, and more than seventy separate lids have also been found. The first results of fragment analysis on the amphorae found in Desilo in Hutovo Blato, near the Illyrian boats, show that most of them are the *Lamborgia vinaria* type of amphora. They were used for the transportation of wine.

The finds also include a Roman boat and the remains of a Roman villa nearby, as well as seven Illyrian tombs, which are older than the ships and have not yet
been fully investigated. The two wooden ships are believed to have been trading or pirate vessels that sank in the marshlands. It is likely that Illyrian pirates, after raiding a Greek or Roman ship, went back to the Neretva Delta to seek refuge in Hutovo Blato where the ships sank. There certainly were pirate activities along the coast, but it seems rather odd that the pirates were so far inland and so near the important Roman colony of Narona. An alternative opinion suggests that Desilo may have been a trading centre.

Fig. 2.22 Desilo archaeological underwater site at Hutovo Blato.

Archaeology of the ancient city of Narona and its surroundings

Narona was located in the area of the modern town of Metković, nestled in the Lower Neretva valley in Croatia. Its remains are found in the area of the proposed Neretva Delta Nature Park, in the village of Vid, three kilometres from Metković.

Numerous prehistoric fortifications –hill fortifications of the Illyrian tribe of Ardia as well as burial tumuli– mark the mountain tops and passes in the wider area. In the fourth century BC, a small Illyrian settlement nestling above the River Naro (Neretva) was used by itinerant Greek merchants trading in the region. Although Salona used to be the centre of the Roman province of Dalmatia, after the Late Republican era Narona played a more significant role on the south-eastern European trading routes, connecting the coast with the hinterland of the neighbouring regions of Herzegovina and, further north, Bosnia.

Narona was mentioned in historical documents for the first time as early as the fourth century BC by Pseudo Scylax and Theopompus. According to archaeological excavations undertaken in 1997, 1998 and 1999, there was an emporium
located at the top of the Neretva River Delta (Roman Naro, Greek Naron) in the second century BC, on the very spot where the Roman forum of the Narona colony was to be built in the last decades of the first century BC. This site was of strategic importance for communication between the Adriatic and the hinterland of the ancient province of Dalmatia and further inland towards the rivers Sava and Danube. Narona was probably given the status of a colony by the emperor Augustus, although there is a dissenting opinion suggesting it had already been a Julian colony (i.e. earlier than 27 BC).

Over the last two decades, a permanent archaeological collection from the wider area has been set up. Archaeological research and conservation of the early Christian basilica and the suburban Roman villa, as well as research on the walls of the upper town, have been completed. In addition, research on the walls of the lower town has begun, including research into the settlement which preceded Roman Narona, whose ruin have been found under the level of the Forum.

Archaeological excavations between 1995 and 1996 resulted in the unearthing of the temple of Augustus. This small temple, which encompasses a cella (inner chamber of a temple) and a propylaeum (porch or gatehouse at the entrance of a sacred enclosure) and was devoted to the Emperor Augustus, had been located on a raised plateau next to the Forum, at the spot where the Lower and Upper Town meet. The temple had a triangular pediment supported by four columns. The outer walls were roughly built in local stone and faced with decorative stucco to resemble ashlar masonry. The single chamber, the cella, had a mosaic floor.

Sixteen monumental figures were found on the site, making it one of the most significant archaeological sites in the region. The temple statues depict the Emperor Augustus and his family, as well as Roman officials. Other objects uncovered included a number of headless marble torsos of male and female figures. From all the archaeological findings excavated, it can be assumed that the temple was built in the first century AD. The temple was destroyed when Christianity became the Empire’s official religion in the fourth century AD, and the decapitated sculptures were cast down from their pedestals.

During Augustus’ lifetime, there had been a podium along the west wall topped by statues of Augustus and his wife, Livia, and perhaps also of Agrippa, Augustus’ right-hand man. After Augustus’ death in 14 AD, the Roman governor of Dalmatia, Publius Cornelius Dolabella, added two more statues representing the imperial couple (University of Oxford, Ashmolean Museum, 2004), as well as a sculpture of the Emperor Tiberius. The number of sculptures increased over the next centuries, leading to the podium being extended along the other two sides of the cella. The marble fragments found in situ include parts of statues of the emperors Claudius (who ruled from 41 to 54 AD) and Vespasian (69 to 79). Few cults could have had more pagan elements than the one practised at Narona. The tem-
ple proved to have been dedicated to the cult-worshipping emperor Augustus as part of the Romanisation process that occurred in the province of Dalmatia in the late first century BC.

The heads of most of the marble statues referred to above are still missing; only the heads from Vespasian and Livia’s statues have survived. The head from Vespasian’s sculpture was found during excavations in the forum area in 1978; the rest of the statue—a figure wearing a toga with his hand across his chest—was found on the mosaic floor during excavations in 1996.

The newly-built Narona Museum of Archaeology is located within the large archaeological site, and is Croatia’s first in situ archaeological museum. The building was designed as a showcase for the ancient temple walls and for the well-preserved Roman mosaic. The collections in the museum contain 900 artefacts from the period between the first century BC and the fourth century AD, all of which have been excavated from the site.

Numerous archaeological objects have come to light during the excavations, and the most characteristic specimens are displayed as part of the permanent collection in the Narona Archaeological Museum. These include fragments of architectural temple ornaments, as well as functional and decorative parts of the forum’s furnishings. The main exhibition hall consists of the temple area itself, including the architectural remains of the Roman temple displayed in situ and the statues of emperors and their family members mounted on a gallery overlooking a black-and-white mosaic floor which highlights them as the most prominent exhibits. Five display sections feature various archaeological objects—sculpture fragments, coins, glass, metal and bone artefacts, pottery and oil-lamps—discovered in the temple area.

The archaeological material is divided into two categories, one covering Narona’s public life and architectural components, the other featuring the objects found at specific sites—including the ramparts, Erešove Bare, the necropolis, the basilica located on the aqueduct route, Njive-Podstrana and St. Vitus—contained in four rows of displays. Chance finds are divided according to themes covering everyday life, the military, the necropolis and the Augustine cult.

The Erešove Bare archaeological site is located in the Bare marsh to the west of the Lower Town. Architectural remains and fragments of frescoes, architectural ornaments and stone sculpture, as well as tiny ceramic and glass shards found at the site suggest that the Roman villa rustica discovered on the site was built in the second century AD. Archaeological research indicates that the villa was built in three stages: its original construction dates from the second century, a new villa was erected at the same site in the third century, and a third stage dates back to the late fourth and early fifth centuries AD.

The villa was probably destroyed in the fifth century, when it was replaced by an Early Christian church. In terms of its construction, the church belongs to the late
sixth or early seventh century. It was built as a single-nave church including a narthex and apse which has a different exterior (rectangular) and interior (semi-circular) shape. The church had a vestibule and annexes on the northern and southern sides. A baptistery was built in one of the northern annexes; octagonal in shape, it was decorated with coloured plaster imitating marble. The baptismal font had steps on its northern and southern sides and was 1.5 m deep. The church was 30 m long by 25 m wide. A pew for the clergy was found by the apse wall, as well as an altar screen dividing the church into two sections: one for the congregation and one for the clergy.

Christianity spread from Narona to the hinterland along the Neretva River, and this type of sacral building had appeared in Herzegovina by the sixth century.

It is probable that the church was no longer functional after the fall of Narona in the early seventh century. Thereafter, the entire site would not be used again until the fourteenth century, when a late medieval cemetery emerged in the ruins of the church. The Church of St. Vitus was built in the seventeenth century, on the site of the cemetery; its southern wall still encompasses the remains of the ancient church walls.

The Church of St. Vitus features an exhibition of archaeological finds from the site of the Early Christian church and the medieval cemetery, with the baptistery and coloured frescoes displayed, as well as some architectural remains from the Early Christian Church that can be seen around the church. The cornice of the stone baptismal font is positioned at the level of the floor of today’s Church, while the font itself is conserved in its original position.

The Erešove Bare site has been conserved and is open to the public.

The oldest remnants of the town’s defensive walls date back to the fourth century BC. They were situated atop a hill where two round towers flanked the main gate. The walls were built in the tradition of Illyrian and Hellenistic fortifications. In the subsequent period, the urban area expanded south-eastwards down the slopes of the hill, while the round towers were replaced by square and rectangular ones, with two lines of walls meeting at the hill-top; the river made walls unnecessary on the eastern side. Six towers were found on the northern wall, as well as the gate on the route from Narona to Salona.

Two inscriptions have preserved descriptions of the construction of the towers. One of these, dating from the Roman Republican era (first half of the first century BC) mentions town magistrates and questions who raised or repaired the tower. Four rectangular towers were discovered along the south-western defensive walls, and these towers are probably contemporary with the remains of the Hellenistic emporium from the second century BC found below the level of the Roman forum.

In the third stage of its development, the settlement spread as far as the foot of the hill that would become the site of the forum: the Augusteum. This was the era of
the *Pax Romana*, and a period in which the town prospered greatly and in which its fortifications were not needed. It was only in the latter half of the second century, when the Germanic Quadi and Marcomanni tribes invaded, that the city’s defensive walls were repaired and rebuilt.

The Ereš Tower stands adjacent to the fourth Hellenistic tower in the southwestern section of the city walls. Built by the pastor of the village of Vid, Friar Bariša Ereš, the tower consists of a main two-storey house and two minor extensions, and was constructed between 1825 and 1851. The Ereš Tower bears a number of Latin inscriptions and has masonry from ancient Narona built into its walls. A total of forty inscriptions in Latin and two inscriptions in Croatian were found in the building. The walls contain a Roman *cippus*, an Early Christian impost\(^\text{12}\), two ancient male torsos made of limestone and the base of an Early Christian altar.

Encompassing many centuries, as they do, the above finds testify to the importance afforded to Narona down the millennia due to its strategic position beside the two Ramsar sites. Once again, it is clear that wetlands have been significant through time, that people down the centuries have organised their lives near water sources, and taken advantage of the privileges such sites could offer in terms of, inter alia, transport, authority and power.

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12 The top course of a pillar that supports an arch.
References
Claridge, A., Kolega, M. and Rodà, I. (2004), Kipovi iz Augusteuma Narone opis - tehnika - ikono-
grafija, VAHD, 97: 199-272.

kovno groblje i novovjekovna crkva, VAHD, 87-89: 9-94.

Marin, E. (2001), Erešove Bare. Villa suburbana iz 3. stoljeća i starokršćanska crkva iz 7. stol-
jeća u Naroni, VAHD, 94: 9-80.


Radović, J. and Vego, J. (2001), Donji tok Neretve: Prekogranično Močvarno Područje, Zagreb, Ministarstvo zaštite okoliša i prostornog uređenja Republike Hrvatske & Ministarstvo građitelj-
stva, prostornog uređenja i zaštite okoliša Hercegovačko - neretvanske županije.


University of Oxford (2004), Ashmolean Museum, The Rise and Fall of an Imperial Shrine: Ro-

General information on the sites mentioned:
http://www.a-m-narona.hr/, checked 8 April 2011.
Archaeological heritage of the Prespa Lakes

Popi Nalpantidou

Abstract
Prespa is a place where Man has lived since prehistory because of the area’s abundant natural resources. Prehistoric settlements, ancient cities and Byzantine and post-Byzantine monuments represent the area’s archaeological heritage. Prespa’s most distinctive monuments are its hermitages, churches, monasteries and beautiful Byzantine and post-Byzantine wall paintings. There are estimated to be approximately 100 Byzantine and post-Byzantine monuments in the three countries that share the Prespa Lakes.

Keywords: Neolithic period, Middle Ages, Byzantine empire, monuments, Byzantine architecture, basilica, hermitage, Prespa

Introduction
The history of humankind starts with water and the species cannot continue without it. Primeval man lived close to springs, rivers and lakes and, globally, civilisations were created and flourished close to large rivers and springs. In Greece, the greatest civilisations –such as the Cycladic, Minoan and Mycenaean– prospered close to the sea and to rivers. It can be demonstrated that since antiquity, people have understood the importance of water and expressed it through their myths, legends and traditions. In ancient Greece, rivers were considered gods, and there were beliefs that nymphs and nereids lived close to springs and lakes and protected them. In addition, philosophers through the centuries have reflected on the many forms of water, understanding many of its characteristics and recognising the ways in which water connects with life, birth and death.

Water has always been the source of life for humankind. It is not by chance that the first organised societies were established close to rivers, lakes and the sea. Prespa is one such place, with freshwater dominating its landscape and a rich archaeological heritage from the Neolithic period to the post-Byzantine period marking its cultural significance.

Historic finds, events and monuments in the Prespa area

Prehistory
The oldest archaeological finds in the region of Prespa date from the Neolithic period (6800-3200 BC), and come from both the Treni cave in Albania and (in
the case of some other, mostly stone tools used by fishermen) from the island of Golem Grad in the FYR of Macedonia.

In the Albanian part of Prespa, excavations have revealed an important number of fortresses dating from the eleventh century BC on, and including the Shuec, Mokut, Vedrocu, Bilishti and Trajan fortresses.

Golem Grad Island in Greater Prespa Lake is an unusual and isolated site, far from communication links. It reveals a long chronology of human presence in the area from the first millennium BC until the Middle Ages. Apart from the Neolithic finds, ceramic vessels from the first half of the first millennium BC have also come to light with characteristics of the Iron Age. This would indicate that there was life on the island, or that attempts were at least made to inhabit it (Bitrakova-Grozdanova, 2007).

Historical period

In the sixth century BC, the Prespa area was probably inhabited by nomadic people, the Dassaretae or Dexari, and possibly by Lyncestians or Triclarians about whom little is known. Geographically, Prespa belongs to the western borders of the land known as Lyncistis. Finds on Golem Grad also come from this period including defensive walls, a settlement, a necropolis, jewellery and coins.

From at least the early fifth century BC on, Prespa was under the influence of the Macedonian Kings. At the death of Philip II, it was part of his kingdom and was subsequently inherited by Alexander the Great. The information available about life in the area during the Hellenistic, Roman and early Christian periods is scanty and based on only a handful of finds. Significant excavations on the island of Aghios Achilleios in Lesser Prespa Lake revealed remnants of the city of Lyka.
Particularly notable are six ancient inscriptions, three of them mentioning the name Lyka for this ancient city, which date back to the second century BC. The excavations on the island have revealed rich and variable archaeological findings such as pieces of a sanctuary, Hellenistic and Roman inscriptions, tombstones and pottery shards of a kind that suggests a flourishing ancient society (Psara, 2001).

In the Early Christian period, the area belonged to the prefecture of Illiricum. Indications of human habitation at this time are very limited, and there has been little archaeological exploration of the region.

The Byzantine period

In the Byzantine era, Prespa came under the administrative jurisdiction of the province of Macedonia II.

From the end of the ninth century AD, Prespa was in the zone of influence of the Bulgar leader, Simeon, who was for many years one of Byzantium’s most powerful enemies, and the region was occupied by the Byzantines and Bulgars in turns. It was the beginning of a very long and bloody war between Byzantium and the Bulgars, each of which was led by significant historical personalities: Samuel, Czar of the Bulgars, on the one side and the Byzantine emperor Basil II, on the other.

Around 980-985 AD, Samuel occupied Larissa and carried off the relics of the local saint, Aghios Achilleios, as well as a number of local workmen with their families and installed them in Prespa were he had his palace. The basilica of Aghios Achilleios, built on the island that bears his name, is one of the most important monuments in the area. It was built in 986 AD by Samuel for the purpose of housing the remains of St. Achilleios. A three-aisled, wooden-roofed basilica, it is an example of an Early Christian church type surviving into the Byzantine period. The magnificent ruins of this basilica show it to have been one of the largest basilicas of the late tenth century (44.70 m x 22.00 m) (Moutsopoulos, 2003).

Even today, we can make out two layers of wall-painting on the bema apses; eighteen arches painted in red belong to the older layer of frescoes, while the figures of military saints belong to the newer wall painting now on display in the Florina Archaeological Museum. A tomb covered with a sculpted limestone slab in the south of the church contains the remains of Aghios Achilleios. This slab, now also held in the Archaeological Museum of Florina, depicts an eagle or falcon attacking a heron close to cedar trees, showing us that the flora and fauna of that time was similar to those we see in Prespa today.

Four other graves, most likely of important persons, are preserved in the southern aisle. One very significant object found in them is a fragment of silk fabric depicting a two-headed eagle with opposed heads. From coins found during excavations, it is believed that the site functioned as a place of worship until the fifteenth century.

The liberation of Prespa by Basil II in the early eleventh century AD encouraged the promotion of a strongly religious life. The distinctive character of the landscape and the isolation of the region influenced the founding of many monaster-
ies, seemingly with the large basilica of Aghios Achilleios at their centre. Particularly representative examples of Byzantine architecture have been preserved throughout the Prespa region (Moutsopoulos, 2003).

Fig. 2.25 The church of Aghios Germanos in Greek Prespa, twelfth century AD.

The church of Aghios Germanos in the village of the same name dates from the early eleventh century AD. It is a cross-aisled church with a dome supported on four pilasters instead of the more usual columns. The form of this church is of special importance in Byzantine architecture, because it is the last example of the evolution of the combination of a fully developed form of the cross plan and the domed basilica. Another important monument of this period is the church of Aghios Nikolaos outside the village of Pyli on the western shore of Lesser Prespa Lake, which dates from the twelfth century AD. The inscribed trefoil-in-square church is a rare type which is found in monastic structures and in Constantinople. This type is based on oriental—especially Armenian—models, but in Greek lands has taken a Byzantine form. Also notable are the church of the Twelve Apostles on the island of Aghios Achilleios, and the church of Saint George in Kurbinovo in the FYR of Macedonia, which dates from the twelfth century. The single-spaced timber-roofed church of Saint George is decorated with murals which typify Byzantine painting during this period.

In the years that followed, the history of this remote corner of the Byzantine empire was marked by repeated occupations and re-occupations. From 1060 to 1085, it was ravaged by Pechenegs, Bulgars, Normans and Alamans. From the thirteenth to the mid fifteenth century, it was held by the Franks, incorporated into the Despotate of Epirus and controlled by the Serb chieftain Dusan and his descendants. The hermitage of Metamorfosi on the rocky shore of Greater Prespa Lake is from this period, as is the church of Saint Peter on Golem Grad, one of the two islands in Greater Prespa Lake. Also on Mali Grad, the smaller island in Greater Prespa Lake, the remains of a single-aisled basilica with a dome in the interior of a large natural cave are dedicated to Theotokos, and date, according to the founders’ inscription, from the fourteenth century (1344/5).
Post-Byzantine period: The Turkish occupation

The Byzantine empire started to collapse in the mid fourteenth century, and the area was occupied by the Ottoman Turks towards the end of the century, ushering in five centuries of Ottoman rule. However, because of its remoteness, Prespa and the region around it remained under the control of local leaders such as the Dragasides.

The location of this area far from urban centres made Turkish rule lighter. This, as well as the extraordinary beauty of the place, attracted large numbers of Christian believers in search of peace and tranquillity in which to worship their God far from the pressure of the Turkish presence. Between the fourteenth and nineteenth century, Prespa was filled with churches, monasteries, chapels and hermitages. Most of the hermitages and monasteries were built during that period along the rocky shore of Greater Prespa Lake. The Analipsi hermitage and the larger Panagia Eleousa hermitage, which housed a large number of monks, date from the fifteenth century. The small church of the hermitage of Eleousa is covered with wall paintings which date from the fifteenth century and were executed by the monk Ioannikios (Evynidou at al., 1991).

Also important are two frescoes depicting the Virgin Mary on the rocks in the bay on Greater Prespa Lake close to the village of Psarades. The first one, from the fifteenth century, depicts the Virgin Mary Vlachemitissa with her arms held open, wearing a dark blue cloak with the little Jesus in front of her. In the second painting, the Virgin Mary is portrayed in the Eleousa form, unusually holding Jesus Christ on her right arm. According to the inscription underneath the fresco, this one dates from the fourteenth century. The inscription also mentions the Dragasides family, and it is known that the last Emperor of Byzantium, Constantine XI Palaiologos, also bore the name Dragasis from his mother’s family. However, the relationship between him and the family is not clear.
Two monasteries are also preserved on the northern shore of Greater Prespa Lake: Saint Paraskevi at Brajicino, which dates from the sixteenth century, and the monastery of the Panagia at Slivnica, whose cruciform church was built and decorated in 1607. Finally, there are the ruins and the church of the monastery of Panagia Porfyra on the island of Aghios Achilleios in Lesser Prespa Lake. This monastery’s timber-roofed church contains paintings which date from the sixteenth century, but also layers of murals belonging to the mid eighteenth century.

Fig. 2.28 The monastery of Panagia Porfyra in Greek Prespa, sixteenth century AD.
The history of the Prespa region mirrors general developments in the Balkans as a whole, and acquired special importance at those times when circumstances created a need for its particular features. Thus, Samuel’s decision to make Prespa the capital of his kingdom, the efforts Basil II made to bring Prespa back into the Byzantine fold, the remoteness of the area that made it a religious sanctuary during Ottoman rule and the availability of abundant fresh water and land for cultivation all played an important role in its history. Of course, the natural aura of the place also played its part—an aura which seems still to exert an influence to this day over the people who live in or visit the area. People are closely bound by myth, legend and tradition to the place and to its history and natural beauty.

References
Bitrakova-Grozdanova, V. (2007), *Golem Grad in Prespa (From Orestians to Romans)*, Macedonian Information Centre (MIC).


2.2 Cultural landscapes

Ramsar guidance

The Ramsar Guidance on culture and wetlands (Papayannis and Pritchard, 2008) includes the following objective on cultural landscapes and the actions to attain it (Ramsar Guidance p. 48):

O.1.1 – To safeguard wetland-related cultural landscapes

In order to achieve the long term conservation of wetland-related cultural landscapes:

a) proceed to identify and compile inventories of cultural landscapes, including information on their conservation status and the trends affecting them;

b) encourage official recognition at the national and international level of wetland-related cultural landscapes as part of the national and, where appropriate, international heritage, with a view to according them effective protection status;

c) promote the protection of such landscapes in policies that concern them directly or may affect them indirectly;

d) ensure that such landscapes are taken into account in territorial planning and in the determination and control of land and water uses;

e) in the case of wetland-related cultural landscapes that still maintain some of the traditional activities that have formed them, as in the case of salinas (see also Objective O.2.6.1), promote economic and regulatory measures for stimulating those activities and ensuring their sustainability. Where this proves impossible, search for other means to maintain the beauty and functioning of these landscapes;

f) where environmentally appropriate and useful, promote the inclusion of wetland-related cultural landscapes in tourism promotion activities; and

g) for exceptionally significant sites, examine the feasibility of their nomination as World Heritage Cultural Landscapes.

From an analysis of the case studies, the discussions at the Prespa Workshop in 2009 and other related work, a number of conclusions can be drawn:

The first –very serious– conclusion is that, in regard to this objective, the Ramsar Guidance seems to disregard the dynamic nature of landscapes and their constant evolution due both to natural processes and to human actions; especially since human actions are changing rapidly and impacting significantly on land-
scapes (for example through the construction of large infrastructure projects), as well as having an indirect impact on natural processes (such as climate change). It is therefore no longer generally feasible to ‘safeguard wetland landscapes’; instead, we have to attempt to maintain their values in a contemporary context.

On the other hand, certain landscapes host archaeological sites of major cultural, historic and scientific importance and may thus need to be strictly conserved in a specific form. Therefore, the protection of archaeological sites in a natural environment, which is quite effective in many Mediterranean countries, may often need to be substantially extended to cover the surrounding landscapes.

Another major point concerns the imperative need to better understand how human actions have transformed landscapes over time. It is known, for example, that agricultural improvements have created the intricate network of canals and strips of lands that is typical of large parts of the Neretva Delta (Papayannis, 2008). There is a need, however, to document how changes in agricultural practices have influenced this particular landscape type, and in turn to predict future developments. Similarly, it has been argued that in Prespa, traditional stockbreeding and cultivation activities have played a key role in the variety of landscapes and ecosystems in the area, and have thus contributed to its rich biodiversity (Kazoglou, 2010). A detailed understanding of this cause and effect relationship would allow us to understand whether—and to what extent—changes in these traditional activities (mainly in the form of increased mechanisation and monoculture cultivations and a decrease in nomadic animal herding) will impact on Prespa’s landscapes. Taking additional factors into account (for instance, the projected impact of climate change and the already evident spread of urbanisation), such an approach would allow measures to be designed that would better mitigate these changes and help maintain landscape values.

Case studies

A first paper in this section, by Med-INA associates Aphrodite Sorotou (archaeologist) and Stefanos Dodouras (sustainability expert), deals with wetland landscapes in the broader regional context. What makes Mediterranean wetland landscapes unique is the fact that, having served as the cradle of several of the world’s oldest civilisations, they have been arena for human interventions for thousands of years. As a result, they have faced a large number of threats, especially in more recent years, and are in need of sustainable management. The authors analyse these threats and consider that a landscape-scale approach may prove helpful when evaluating the impact of human activities on the environment, with sustainable development providing the key for a viable future.

The second author in this section is the writer Julian Hoffman, who was raised in Canada but has chosen to live in Greek Prespa. He takes us on a journey through both the most common and the less celebrated landscapes, as seen through the innocent eyes of a child. His refreshing look on the natural world takes us back to our childhood and reminds us how children perceive and appreciate nature in even its most humble forms.
Wetland landscapes in the Mediterranean: current concerns for a sustainable future

Aphrodite Sorotou and Stefanos Dodouras

Abstract
The Mediterranean region is home to some of the world’s most unique landscapes. Wetlands, in particular, have always been an important element of these landscapes, sustaining a rich biological diversity and providing valuable resources to the people living around them. The presence of humans has created rich landscape features, but it has also degraded many wetlands. To be effective, wetland landscape protection requires sustainable management and effective planning policies. Both should be based on giving opportunities and responsibilities to different activity centres and stakeholders, all of whom should have a say in the planning and decision-making processes. An accessible, participatory and informative approach is likely to improve communication and co-operation, allocate responsibilities effectively, utilise information and contribute to the sharing of experience and the transferral of knowledge for the upkeep and conservation of wetland landscapes in the Mediterranean.

Keywords: Mediterranean, wetlands, landscape approach, sustainability, integration, European Landscape Convention objectives

Introduction
The Mediterranean region is home to some of the oldest inhabited landscapes in the world, which are the result of continuous processes of interaction between mankind and nature. Evidently, wetlands and their surrounding landscapes are no exception. Wetlands, in particular, have always been an important element in the Mediterranean landscape, sustaining a rich biological diversity while also providing water, food, raw materials and transport for the people who live around them.

Even though wetland landscapes have played a fundamental role in contributing to the distinctive sense of Mediterranean identity, human craving for the profit that can be made through their abuse and overuse has greatly reduced their numbers; today, more than half of the Mediterranean’s wetlands have disappeared; in some areas, the number of wetlands has fallen by 90% (Papayannis and Salathé, 1999), leaving the landscape profoundly changed. Reversing this trend will require a deep understanding of the characteristics and functions of these land-
scapes and the pressures they face, coupled with the promotion of a series of sustainable activities in which expert knowledge is combined with representative views from various sectors of society.

Mediterranean wetlands and their significance

Wetlands provide an astonishing setting teeming with countless forms of biological life and activity. The international Ramsar Convention on wetland conservation and wise use (1971) defines wetlands as ‘areas of marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed 6 metres’. Wetlands as defined by the Convention can include ponds, lakes, rivers, streams, bogs, marshes, fens, flood meadows and estuaries.

According to the Wildfowl and Wetlands Trust (2003), 3% of the earth’s surface is covered by wetlands, while 75% of the human population lives in former wetlands and surrounding areas. Wetlands provide vital water resources for all types of human activity (domestic uses, agriculture, industry etc.). By absorbing heavy rainfall, they reduce the risk of flooding, and by stabilising soil and sediments they help to maintain the boundary defences of lakes, rivers and seas. They act as purifiers and maintain water quality.

Unfortunately, wetlands have not always been appreciated for their high hydrological importance; indeed, in many cases, they have been viewed as an obstacle to agricultural and economic development. In the Mediterranean, in particular, wetlands have been seen as a health risk (malaria), which led to their being drained, as in the case of Lake Karla in Greece in the 1960s (Sivignon, 2007) and, earlier, the Pontine Marshes in Italy. Their drainage was intended to create a large flat area for cultivation and/or grazing. For good or ill, the fate of Mediterranean wetlands has tended to be prescribed by central decision-making bodies with minimal knowledge of natural systems and of the implications of the unsustainable exploitation of their resources.

Seeing Mediterranean wetlands in their landscape context

Wetlands form an integral part of the repertoire of landscapes, environments and microregions in the Mediterranean area.

‘Wherever a seasonal watercourse backs up behind beach deposits, wherever the accidents of topography render a valley floor less quick to drain, or wherever fault-lines have created intermountain basins, zones of inland drainage, there is a potential wetland, ranging in degree of saturation from perennial pool or lake to marsh which dries out in the summer’. (Horden and Purcell, 2000)
The variety of Mediterranean wetlands (from deltas, coastal lagoons, salt marshes, rivers and their associated floodplains to permanent and temporary marshes and lakes, salinas, oases, chotts and sebkhas) leads to a great variety of landscape forms. Yet what does the term ‘landscape’ mean, and what is so characteristic of wetland landscapes?

Fig 2.29 A small wetland created by mining on Milos, Greece.

Introducing the landscape approach

‘Landscape’, a difficult term with many meanings and numerous interpretations, ‘is a human concept and as such encompasses how people view, hear, smell and feel the land and their surroundings [...] and the feelings, memories or associations that they evoke’ (Natural England, 2006). The European Landscape Convention (ELC), the first international agreement focusing exclusively on this topic, defines landscape as ‘an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors’ (Council of Europe, 2000).

Thus, the concept of landscape begins from an assumption that it is the result of an interaction between the environment and humans. The region is, after all, one which has been shaped as much by its long history of human habitation as by its continuously changing natural processes. Today’s commonly employed environmental and/or spatial approaches do not necessarily share this holistic starting point. A landscape-based approach can provide a useful insight into the multifunctional character of wetlands, since it is a method which integrates ecological, economic and socio-cultural dimensions. Simultaneously, it provides a naturally meaningful scale on which to understand the forces of change and impact, and is an appropriate scale on which to explore the interactions between natural qualities and cultural values. Such an approach provides the tools for under-
standing the ‘bigger picture’ (Cassar, 2010). The landscape approach can therefore be an excellent framework for conservation decisions, whether they relate to intervention measures, improving planning processes or implementing conservation activities. The landscape approach can help our understanding of a whole range of ecological processes (in relation to human activities), and can enable the societal participation that is critical to achieving conservation objectives (WWF, 2002).

**Forces of change in Mediterranean wetland landscapes**

Considering Mediterranean wetland landscapes, one can refer to the floodplains of a perennial river like the Nile or the wet meadows of a lake like Prespa; both provide an extended chain of environmental opportunities for both flora and fauna. Other examples include the oases of Tamentit, the prehistoric remains of Kizören Obruk, the antiquities of Butrint and cases like the drained Lake Karla (Papayannis, 2008). The human/nature relationship has often determined the character and identity of Mediterranean wetland landscapes, resulting in a high degree of heterogeneity in space and time as well as a high degree of connectivity and permeability (García Mora and Montes, 2003).

A complex and interrelated range of environmental, economic and social ‘forces of change’ influence the function and character of continuously evolving wetland landscapes. Some changes are caused by natural forces, such as climate change, others by human development and the changing demands of society (Papayannis and Sorotou, 2007).

**Water**

Water characterises wetlands; it is their most vibrant and fundamental aspect. Water is subject to seasonal changes, turning into snow and ice in winter and impacting dramatically on the visual aspects of landscapes (Papayannis and Sorotou, ibid.). It also moves, as a result of flow or the action of wind, and this movement gives wetland landscapes a dynamic aesthetic.

It is impossible to speak about a wetland landscape without reflecting the presence of water in the landscape. The anaerobic conditions and soil changes caused by water when it floods areas of land leads to the development of plants that exhibit a variety of physical and physiological adaptations to growing in conditions of reduced oxygen availability (Lyon, 2001). Such wetland plants are not found in other conditions, and are therefore characteristic of these landscapes.

Undoubtedly, water is the primary element in a wetland landscape, and any change in its quantity, quality and distribution can dramatically alter its appearance.

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13 ‘The capability of the area to facilitate the flow of one species or a set of species’ (García Mora and Montes, 2003).
14 ‘The capability to maintain within the area the essential ecological wefts and flows’ (ibid.).
Biodiversity

An impressive diversity of species live in wetland ecosystems. These include microbes, plants, insects, amphibians, reptiles, birds, fish and mammals. Many species rely on wetlands for food, water and shelter, especially during migration and breeding. The variety of species and their number may have a significant impact on the formation of wetland landscapes\(^\text{15}\). The loss of an individual species may have irreversible consequences both for the ‘life-chain’ of the ecosystem and for the aesthetic values of the landscape. Humans, being a part of this biodiversity themselves, have the power to protect the landscape and its ecosystems or to destroy them.

Agriculture

Agriculture, whether extensive or intensive, is a key factor in shaping the visual and other features of rural areas, and is important in creating valuable habitats for wildlife. At the same time, habitats such as wetlands, particularly because of their hydrological connections with other part of the landscape, are susceptible to damage from a wide range of agricultural activities that take place both within wetlands themselves and in their surrounding catchments.

The causes of such damage may include any combination of the following: direct physical impact on habitats and species, introduction of new species or varieties, unsustainable water exploitation for irrigation (whether from rivers or aquifers), pesticide and fertiliser use and the dumping of waste.

Sustainably practised stock-breeding can ‘contribute to the diversity of shoreline ecosystems and surrounding landscapes in many ways, with positive ecological

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\(^{15}\) The variety of species, as well as a single species, can affect both the values and functions of a landscape. The variety of species also has a great visual impact, as it means more colours, sounds, smells etc. in the particular landscape.
and aesthetic results. Excessive grazing pressure can, however, deplete vegetation, impoverish ecosystems and cause trampling of waterfowl nests’ (Kazoglou, 2004; Papayannis and Sorotou, 2007). There are also many cases where stock-breeding has been abandoned, leaving hundreds of hectares of eroded land along the edges of wetlands or on the mountain slopes around them.

**Urbanisation**

By definition, urbanisation involves the replacement of natural habitats with built-up areas that sustain human habitation and its related activities (Papayannis and Sorotou, 2010). It is a major cause of wetland loss around the Mediterranean, as the demand for land shows a continuous increase, both for building and for new transport and other auxiliary infrastructure.

Urbanisation (through, for example, the modification of hydrological and sedimentation regimes, or the dynamics of nutrients and chemical pollutants) influences both the structure and the functions of wetlands and the surrounding landscapes (Lee et al., 2006). It can also have a great impact on them visually. Natural wetlands are often characterised by a hydrological regime that encompasses concentrated flow during flood events and diffused discharge into groundwater and waterways during non-flood periods (ibid.). Any disruption of this can result in various –sometimes irrevocable– changes in the functioning of the hydrological cycle.

In addition to effects on the hydrological cycle, land use for urban and related infrastructures often has a high impact on the rest of the environment through the direct destruction of habitats and wildlife, as well as disturbances resulting from noise, resource use, waste dumping and pollution.

The spread of urbanisation, planned or unplanned, for permanent or resort housing and for tourism is also having a direct affect on wetland landscapes. In contrast to traditional small-scale construction, which uses local materials and is more harmonised with its surroundings, large-scale construction projects have a greater aesthetic and functional impact on the landscape. Extensive urbanisation may also result in the loss of large areas of wetland and the fragmentation of ecological connections within the landscape. Finally, the construction of large public works such as water and rail arteries, airports, harbours and energy networks can have a major impact on wetland landscapes, either directly or indirectly.

**Mediterranean wetland landscapes: a sustainable future**

A distinctive hallmark of landscape in general is the dimension of ‘scale’: ‘landscapes display inherent patterns, closely related to underlying processes, permitting the identification of distinctive units within which environmental and socio-economic interactions can helpfully be framed’ (Selman, 2006). ‘Culture’ is a
complex term, the interpretation of which evolves over time in order to take account of new socio-economic and environmental aspects. In 2002, the Ramsar Convention on Wetlands adopted Resolution VIII.19 on ‘Guiding principles for taking into account the cultural values of wetlands for the effective management of sites’, which includes under Guiding Principle 3 an objective ‘to safeguard wetland-related cultural landscapes’. The landscape scale can facilitate an appreciation not only of nature/culture relations, but can also serve as a holistic framework for responding to complex challenges (Selman, 2006; Cassar, 2010).

![Fig 2.31 Lignite exploitation in the area brought several thermal power stations to Yellow Lake, which impacted powerfully on the landscape - Kozani, Greece.](image)

The degradation of wetlands is a continuing reality, with severe damage affecting wetland landscapes and leading to a decline in functions, services and values. A widespread inability to appreciate wetland landscapes as a common good, as well as various local vested interests that neglect the values of wetland landscapes, can lead to uninformed planning and policy-making processes that favour unsustainable development schemes. The preamble to the European Landscape Convention, the first multilateral treaty exclusively concerned with all aspects of European landscape, gives prominence to sustainable development as one of its objectives through concern ‘to achieve sustainable development based on a balanced and harmonious relationship between social needs, economic

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16 Papayannis and Pritchard (2008) write: ‘The protection of cultural landscapes, which have resulted from traditional human activities, should be a major component of policy and management objectives. Today, we lament the extent and depth of destruction caused by contemporary human activities, from urbanisation to forest clear-cutting, from transportation infrastructure to mining. Yet traditional activities created landscapes compatible with the natural environment, of considerable biodiversity and of a unique beauty. Many examples come to mind, such as the sculptural rice fields in many parts of Southeast Asia, the canals of the Neretva River in Croatia, or the land terracing in most Mediterranean islands. In numerous parts of the world, the traditional activities that have moulded the landscape for millennia are regressing or disappearing. As a result, the landscapes dependent on them are starting to erode and may also disappear with time, leading to the loss of their cultural values.’
activity and the environment’ (Council of Europe, 2000). The successful management of wetland landscapes requires improved land use planning, sound conservation goals, efficient monitoring mechanisms and recognition of communal values. In this context, associated policies should be geared to sustainability: i.e. taking the appropriate measures to ensure compatibility between the managed evolution of wetlands and socio-economic development objectives which would otherwise tend to alter the landscape.

Until very recently, wetlands were studied mainly for their ecological values, while landscape researchers paid little attention to them as a separate landscape type. Given, however, that people value wetland landscapes for many different reasons, the cognitive dimension should be included among the dimensions recognised in the notion of wetland landscapes. Among the most important principles of the European Landscape Convention is the principle of integration. More specifically, Article 5.d places an obligation on Contracting Parties relating to integration: ‘Each Party undertakes: to integrate landscape into its regional and town planning policies and in its cultural, environmental, agricultural, social and economic policies, as well as in any other policies with possible direct or indirect impact on landscape’. An integrated approach can be important for better understanding the links and different trade-offs involved in trying to reach desired target states (Dodouras, 2007), including the protection, management and planning of landscapes –in this case, wetland landscapes.

Mahatma Gandhi once said that ‘the earth provides enough to satisfy every man’s need but not every man’s greed’ (Chowdhary, 1989). Bluntly, sustainability is about the future of the planet, and whether it has a future. However, it is difficult to measure the achievement of sustainable development as a target. It may be of more value as an ‘umbrella’ under which the integration of countless interrelated issues can occur. A key question, therefore, is how different individuals can communicate and understand each other more effectively so their decisions can have a better impact. In other words, the fundamental question that remains to be answered is how to integrate these issues into practical decision-making (Dodouras, 2007).

Contemporary society needs to take a long hard look at the current and long-standing issues that characterise its development processes, and come up with creative approaches to understanding and problem-solving. Integration may seem to be a cul-de-sac, since the aim of bringing various sustainability issues into the same framework seems unrealistic. Integrated approaches must therefore take a wide variety of factors into account, co-ordinate initiatives, resolve conflicts and incorporate diverse concerns into planning, policy and decision-making through the delegation of responsibilities, which may contribute to more participatory and democratic processes (Dodouras and James, 2005).
The natural environment is society’s primary resource base, and neglect of its processes can have serious socio-cultural and economic repercussions. In comparison to much of the western world, awareness of sustainability concerns has been a long time coming to the Mediterranean Basin. Sustainability issues related to intensive agriculture, urbanisation, unemployment, transport, tourism etc. have only come to the fore recently, when they attracted the attention of scientists and organised social groups. Although national governments and regional and local authorities in the region have expressed their concern, little has been done to deal with issues such as deforestation, eutrophication and the commercialisation of natural resources despite their lofty talk and ambitious planning (UNESCO World Heritage Centre, 2003). The sustainable conservation and management of wetland landscapes cannot be governed solely by legislation and regulation. It must also extend to various sectors of the socio-economic and cultural life of human societies. In this respect, the upkeep and conservation of wetland landscapes in the Mediterranean should be a constant learning process through increasing participation and awareness of relevant issues.

The sustainable management of Mediterranean wetland landscapes should be based on opportunities and responsibilities being given to different activity centres and stakeholders who should all have a say in the planning and decision-making processes. The major challenge of managing knowledge is not so much its creation, but more its capture and integration. If current knowledge and the real concerns of all the parties concerned are not incorporated into the planning, impact appraisal and assessment, decision-making and monitoring processes, the inevitably narrower views on the directions to be taken in the future are unlikely to produce high-quality sustainable outcomes.

Fig. 2.32 Uncontrolled waste dumps next to mountain streams - Mount Pelion, Greece.
Conclusions

Wetland landscapes are among the most important and the most vulnerable types of landscape in the Mediterranean. Human activities have greatly reduced wetland resources in the region to the extent that remedial action is now imperative.

Indubitably, numerous initiatives and actions are currently seeking to promote and protect wetlands in the Mediterranean. A landscape-scale approach provides the most appropriate basis for assessing the impact of human activities (urbanisation, industrialisation, tourism etc.) on sites, while deepening our understanding of human/nature relations.

To be effective, wetland landscape protection requires sustainable management and effective planning policies. The European Landscape Convention, for example, considers landscapes to be an integral part of all environmental policies; yet, if landscapes are to be seen as a key piece in the sustainability jigsaw for the better management of wetlands, it remains to be considered what sort of conceptual framework would best pave the way. Perhaps future planning and policies should focus on people’s growing need for high-quality wetland landscapes with natural, cultural, aesthetic and symbolic values.

Concrete proposals are now needed. An accessible, participatory and informative approach is likely to improve communication and co-operation, allocate responsibilities effectively, utilise information and contribute to the sharing of experience and the transfer of knowledge for the upkeep and conservation of wetland landscapes in the Mediterranean.

References


Dodouras, S. and James, P. (2005), *Participative and Integrative Techniques to Improve Multidisciplinary Communication: A Precursor to Producing Sustainability Profile Indicators*, Prague: Jan Evangelista University, pp. 376-385.


Kazoglou, Y. (2004), The importance of the wet meadows, *I Fysi*, 107, 4-7 (in Greek).


A Prespa landscape: the wonder of ordinary places

Julian Hoffman

Abstract
Children tend to perceive landscapes of widely differing conventional value with equal interest; for them the smallest things carry infinite potential. Using examples of this instinctive engagement with the natural world, ‘A Prespa Landscape’ explores what might be learned when approaching ordinary landscapes with a similar sense of curiosity and wonder. While areas of rich cultural or biological diversity are rightly celebrated and protected, the common landscapes that surround us remain generally unsung and unseen. This invisibility can eventually lead to assumed irrelevance and the consequent impacts of damaging and exploitative practices. The shore of Greater Prespa Lake in Greece is such a landscape, but through a combination of heightened perception and a childlike lack of self-consciousness, an ordinary landscape such as this can provide great possibilities for discovering the extraordinary, and thereby developing lasting and respectful relationships with a variety of places.

Keywords: Ordinary places, landscape values, perception, imagination, childhood wonder, equality of interest, Prespa Lakes, Barry Lopez

Many of the world’s landscapes are lost to us. They have vanished from our lives, become extinct. But they have disappeared not because of urban sprawl or the pressures of tourist development. They have not disappeared due to deforestation or a toxic accumulation of pollutants. Nor have they vanished because of weak legislation or the lack of political will and the funds necessary to secure them. Many of the world’s landscapes are lost to us because they are invisible. We do not see them for what they are.

While nations may try to preserve and protect a handful of ecologically significant areas within their borders, the total area these parks and reserves amount to in relation to a country’s land mass is minute. Much of Europe, much of the world perhaps, is actually composed of what could be described as ordinary landscapes. They are the everyday places, like the fields and hills we pass on the way to work. They are the areas at the edges of our cities and villages, such as old orchards and weedy wastegrounds. They are the places we might visit on a summer’s afternoon—a small urban woodland or a pond to picnic beside, perhaps the ordinary shore of a lake.
To describe a landscape as ordinary is to say that it is considered to be common and, on the surface at least, undistinguished. Generally it is a place that is not protected in any real sense. It rarely contains any significant cultural monuments, nor is it the focus of international work on habitat preservation or rare species protection. It is a place that is of little conventional value and often not even particularly aesthetically attractive, being made up of an odd assortment of habitat fragments or existing on the fringes of agriculture and development. But these ordinary landscapes are of extreme importance, not because of their abundance, but because it is here that connections with the natural world can most easily and enduringly be made.

Prespa is full of such places. Although Prespa as a whole is seen as extraordinary, there are many less celebrated landscapes within it. While Lesser Prespa Lake, with its important breeding colonies of rare water birds and its island of rich Byzantine monuments, is rightly regarded as both the ecological and spiritual heart of the lakes basin in Greece, there is an extensive ‘body’ that surrounds it. The Prespa basin is a great mosaic of landscapes that continue to evolve, both naturally and as a result of human activities. These range from the steep surrounding mountains once terraced by hand to agricultural fields only recently claimed from wet meadows. There are dense forests of beech and oak, and stands of old junipers; along with orchards, hedges and river corridors that break up the agricultural plains.

There is one particular Prespa landscape, however, that I find myself returning to year after year, and season after season: the shore of Greater Prespa Lake in Greece. The lakeshore landscape is a recent phenomenon. Although the exact
causes are unknown, the water level of the lake has dropped considerably over
the last half-century. While the water loss is mourned by many, it is only one of
a number of transformations taking place along the lakeshore: a progression of
new habitats is quietly taking the lake’s place. In essence, the ancient lakebed is
rising to the surface. As you approach the coast from the isthmus that separates
the two lakes you are in fact passing over a series of old shorelines, each fla-
voured according to the conditions when it first emerged and the flora and fauna
that subsequently made it home.

These emerging habitats occupy a long, curving ribbon of land adjacent to the
shore. There are wide bands of sandy scrubland, dotted with wild roses, brambles
and a variety of wildflowers. A dense forest of silver birch and poplars has
sprung up towards one end of the shore, where the silver birch reaches its
most southern distribution within Europe. Reedbeds spread thickly in places.
A long line of willows follows the river to the lake, where an ever-changing
estuary remakes itself each day. A seasonal string of clear-water pools lie close
to the lake and, in recent years, an extensive marsh system has claimed parts
of the shore.

This landscape has come to feel like home to me. What first led me to it, though,
was its unprepossessing nature. It was rarely visited and I heard few people speak
about it. It appeared to be a landscape of little distinction, an ordinary place. But
even ordinary places contain wonders.
When it comes to wonder and the natural world, children are the true specialists. They are particularly open to that state of astonishment that we associate with awe. A child, in the most common of landscapes, is capable, through a combination of intense perception and imagination, of discovering an entire world in the smallest fragment of nature. It might be among wildflowers and weeds at the edge of a scrubby field where an iridescent emerald beetle or the bright flight of a butterfly can hold a child’s attention for several minutes. It could be along a river bank where a child excitedly follows an oak leaf as it travels downstream. It might simply be the prints of an animal, perfectly preserved by snow, that captures a child’s imagination.

What is so remarkable about children’s perception, even more so than its intensity, is that it is characterised by an equality of interest. Everything a child encounters in nature, no matter how small, offers possibility and is therefore equally fascinating. Children make little distinction between major and minor motifs. A feather found on the beach is as wondrous as the creature it belonged to.

As childhood is left behind, adults tend to shed that capacity for curiosity, that spirit that animates the smallest things. We yearn for greater and faster excitements; we seek larger vistas, grander views. But in a contemporary Western world increasingly obsessed by speed, style and seduction, there is perhaps all the more need to reclaim the ordinary, to celebrate the everyday. Because the ordinary, when perceived in the spirit of curiosity, is actually extraordinary.
The American writer and naturalist, Barry Lopez, once wrote that ‘with the loss of self-consciousness, the landscape opens’ (Lopez, 1989). This, I believe, can be understood in two ways. First, when we let go of our constant self-awareness and regain something of a child’s immense curiosity and interest in the world ‘out there’, the world around us, we become more attuned to its wonders. Leaving something of our self behind, other lives arise in its place. That is when the ordinary transforms into the extraordinary, and a landscape like the shore of Greater Prespa Lake becomes something else.

In spring, the ponds at the edge of the lake fill up with terrapins sunning themselves on sticks, electric blue damselflies skate through the air above them and millions of tadpoles wriggle past water snakes coiled beneath the surface. The willows along the river resound with the liquid calls of golden orioles and bee-eaters fly overhead like a scattering of gems. At times, a dusky red fox will scour the beach in sunlight alongside egrets and herons, all slowly circling each other as though in a dance. But these wonders are perhaps too obvious. They are emotionally fulfilling and difficult to miss; they are bright with beauty and colour and grace.

Barry Lopez’s assertion about landscapes, however, provides a second clue to engaging more deeply with place. To be self-conscious means not only to be aware of one’s own mind and actions, but to be conscious of being observed and therefore embarrassed as a result. Self-consciousness prevents us from doing many things, but in the case of a landscape it can stand in the way of knowing it.

Fig. 2.36 Feathers.
Landscapes are best learned through proximity. Wherever children go, they are tempted to climb trees. They slither through long grasses like snakes, eyeing up insects excitedly from their own height. They make hideaways in dense shrubs. Children catch frogs in their hands and then slowly open their fingers to reveal them. They collect caterpillars in jars, fascinated by the coming transformation. Children’s inquisitive experience of the natural world is hands-on, intimate and utterly unforsensible. They are part of a place, not distinct from it.

When we approach similarly, with a sense of freedom unburdened by embarrassment, we open ourselves to the quieter aspects of a landscape. How the light falls through the willow leaves, passing through them like waves. How bear prints and otter tracks lead us first along the beach and then into their lives. The way tiny, resplendent butterflies gather around a flower. There are the curious sounds of water and reptiles in the marsh. How the wind breathes mysteriously through the reeds, their seeds catching the light as they float above the river. The way the bark of a silver birch feels like ancient paper in our hands. Walk into any pocket of the shoreline landscape and there is a world of new moments unfolding.

All landscapes contain the seeds of astonishment. Whether we let them take root or not is up to us. But if we become aware of the wonders within easy reach, those close at hand and part of our daily experience, then the everyday places that we live amongst become less easy to dismiss. The greatest threat facing many landscapes is their assumed irrelevance. When a place is perceived to hold little of interest or importance, then a whole landscape can turn invisible and be treated accordingly. Though any child will show you there is no such thing as a place without interest.

Fig. 2.37 Shell in Moss.
A landscape deemed irrelevant can be regularly threatened by damaging activities. Along the length of the Greater Prespa lakeshore in Greece, sand is continually being extracted to make cement, eradicating the fragile ecosystem of wildflowers and grasses. The dumping of household and building waste is common. In recent years, shepherds have moved their flocks into the area on a nearly permanent basis, upsetting the traditional pattern of rotational herding, and the consequent overgrazing, tree felling, erosion of the river banks and random reed burning has greatly disturbed the integrity of the place. There is increasing waste washing ashore from fishing boats and visitors leave behind a great volume of garbage that is not collected by the municipal authorities. Many common landscapes suffer this casual disregard, and Prespa is no different. The old notion of ‘out of sight means out of mind’ seems perfectly suited to our relationship with ordinary places.

To discover wonder in a place is to begin to feel affinity; it offers the possibility of approaching all landscapes with equal interest. Ultimately, landscapes can be transformational. As much as the Greater Prespa lake is changing and making way for something else, to enter that shoreline world in a spirit of curiosity and attentiveness is to allow ourselves to be changed. Each time we engage with a landscape we are offered the opportunity to remake it through awareness, by being open to the extraordinary within it. Even the most common of places can come alive and take root in our inner lives. A single small spark, as children demonstrate so very well, is often all it takes. And when a landscape is no longer invisible but revealed for what it truly is, then that landscape stands a chance of connecting with our lives. If that happens, we are less likely to let it disappear.
Fig. 2.39 Tiger Moth.

Reference
chapter 3
Primary use of wetland resources

In a broad sense, all human activities—including productive ones—may produce culture\(^1\) and thus incorporate cultural values (Kroeber and Kluckhohn, 1952). It should be pointed out, however, that in the context of this particular book and the organisations related to it\(^2\), interest in culture is not viewed independently as a stand-alone objective, but always in relation to nature conservation and wise use. The aim is to create synergy through the joint management of the natural and cultural heritage, with substantial benefits on both sides.

The cultural aspects of primary productive activities related to wetlands are of great importance in reconnecting people with the natural environment. It should be noted, too, that any given use is not necessarily inherently beneficial or damaging to wetlands; this will depend on the particular context and circumstances of each individual case.

This book accords with the Ramsar Guidance in making a distinction between primary and secondary uses of wetland resources, but does so for purely practical reasons relating to the organisation of material, and not as a matter of scientific principle: the distinction between the two is never entirely clear-cut.

**Productive activities related to wetlands**

As noted above, no wetland-related activity can be considered a priori either beneficial or damaging to wetlands; the impact of a given activity depends to a large extent on the particularities of each case. This reinforces the need for guidance on wise use, which the Ramsar Convention has provided consistently over the past three decades (Ramsar Secretariat, 2007). It can be argued that taking into account and enhancing the cultural values of productive activities can increase the chance of resources being used wisely, since these values incorporate distilled human experience and wisdom.

Productive activities can be grouped into three categories: the first concerns materials directly extracted from the wetlands; the second includes products developed from such materials (a rather artificial distinction, as noted above); the third

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\(^1\) According to Kroeber and Kluckhohn (1952): ‘culture systems may […] be considered as products of action […]’.

\(^2\) Such as the Ramsar Convention, MedWet Initiative, MAVA Foundation and Med-INA.

< Fig 3.0 Salt worker, Sečovlje Salinas, Slovenia.
concerns services provided by wetlands that have clear economic values. Key examples are summarised below:

### Table 3.1 Extraction and use of natural materials.

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<thead>
<tr>
<th>Category</th>
<th>Examples</th>
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<tbody>
<tr>
<td>Wetland materials directly extracted</td>
<td>Fish and molluscs (wetland fisheries)</td>
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<td>Game for subsistence hunting</td>
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<td>Biomass (grazing and other uses)</td>
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<td>Salt and salinas</td>
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<td>Freshwater (for irrigation, industrial and domestic use)</td>
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<td>Milk products and meat</td>
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<td>Fish-derived products (bottarga, fish roe, smoked mullet)</td>
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<td>Provision of services</td>
<td>Water-cycle equilibrium: groundwater replenishment</td>
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<td>storm protection and shoreline stabilisation</td>
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<td>Sport activities and hunting</td>
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**Potential synergy**

Major wetland sites, if reasonably well managed and protected, are widely recognised, attract large numbers of visitors and project an image of quality. This sense of quality can be skilfully transferred to products associated with them, making them considerably easier to market – given, of course, that such products maintain high standards of sustainability and are reasonably priced. In turn, wetland products with a high reputation may transfer some of that reputation to the wetland itself, creating a win-win situation.

The Ramsar Guidance offers the following considerations for the certification of such wetland products (Ramsar Guidance, p. 51):

**O.2 –**

To consider the possibility of using certification labelling of sustainable traditional wetland products in a voluntary and non-discriminatory manner

The following actions may be required:
a) identify appropriate partners from the private and public sectors for promoting wetland-related products that are consistent with the maintenance of the ecological character of sites;

b) promote the quality, origin and sustainability certification labelling of wetland products as a means to increase their attractiveness and demand;

c) encourage advertising campaigns of wetland products under the responsibility of appropriate national and local authorities, as well as of interested communities and the private sector; and

d) ensure that the economic benefits of these undertakings reach the local communities, thus assisting in the maintenance of traditional production activities.

Perhaps this guidance should be strengthened by specifying that such products should be the result of organic methods of production, or of the codes of 'good agricultural practice'.

It would also be appropriate to advise that the particular wetland should be advertised on relevant packaging and promotional materials. A good example are the dried beans produced organically in the Prespa Lakes area, which have been marketed very successfully in Greece using a wetland logo. In addition, lima beans (*Phaseolus lunatus*) are now known throughout the country as ‘Prespa beans’.

![Fig. 3.1 Packaging for dried beans from Prespa Lakes.](image)

**Perspectives**

The quality brand of a well-managed wetland site can be used in promoting related services, and nature- and culture-oriented tourism in particular. By combining the promotion of local quality products and their incorporation into visitor...
menus with an enriched visitor experience through participation in traditional agricultural and stockbreeding activities, a powerful pole of attraction can be created which can, in turn, contribute to an improvement in local incomes (see also Chapter 4.1, p. 253).

Such complex arrangements require a high degree of organisation at the site level as well as an entrepreneurial orientation. Although these are not common, they have begun to make their appearance at a number of Mediterranean wetland sites, while there are clear indications that this may prove a promising perspective for the future with multiple benefits.

References


3.1 Agriculture and stockbreeding

Freshwater wetlands are an important resource for agriculture and stock breeding, as they can provide water for irrigation and use by animals, as well as biomass for grazing and fodder. Grazing is now also being used successfully in many Mediterranean wetlands as a management tool for controlling reed vegetation and increasing the diversity of wet meadow ecosystems (horses and bulls in the Camargue; water buffalo in the Prespa Lakes).

Ramsar Guidance

The Ramsar Guidance does not include specific advice on these primary activities. Based on the Mediterranean experience, a number of suggestions can be made for optimising both agriculture/stock-breeding activities and wetland conservation; they focus on making good use of traditional knowledge from both sectors. These include wise management of freshwater, with regard both to quality for irrigation and animal watering and to the quantity abstracted, the collection of fodder, and the permitting of grazing in wetland areas within sound conservation limits (see Annex II, p. 411).

A case study from Prespa Lakes

Yannis Kazoglou has a Ph.D. in Rangeland Ecology. A senior biologist with the Society for the Protection of Prespa in Greece, he describes how agriculture, stockbreeding and wetlands have evolved in recent years. These traditional activities have been transformed by the needs of economic development, with expanding agriculture putting pressure on both stockbreeding and wetlands, forcing rangelands, pastures and grazing animals towards mountainous areas, limiting habitat and species diversity, and putting associated cultural values at risk. Positive measures have been taken to alleviate these problems, while making good use of traditional knowledge. The case of Prespa is used as a good contemporary example of these activities co-existing in a transboundary site (shared between Greece, Albania and FYR of Macedonia).
Agriculture, stockbreeding and wetlands: the case of Prespa

Yannis Kazoglou

Abstract

Agriculture and wetlands in the Mediterranean have co-existed for more than 10 000 years, providing humans with valuable resources. However, the need for economic development has led to an imbalance as, in many cases, arable agriculture has caused severe pressures on both stockbreeding and wetlands, mainly by occupying the most productive soils. Thus, rangelands, pastures and grazing animals have been ‘pushed’ towards mountainous areas, while wetlands of importance for biodiversity have been drained to become farmland. At the same time, stockbreeding in wetland areas has also reduced, leading to limited habitat and species diversity, often expressed by the dominance of mono-specific habitat types. On another level, due to this imbalance, other values were lost or diminished as well, such as important elements of agro-biodiversity (e.g. domestic animal breeds, old plant varieties), knowledge of traditional farming practices and manufacture of local products, and diversification in the primary production sector. In parallel, rural populations either declined or became less interested in maintaining such values. Nonetheless, relatively good examples of the co-existence of agriculture, animal husbandry and wetlands still exist in some areas, and Prespa can be considered as one such example. The present paper aims to highlight the links between these three features of the transboundary protected area of Prespa through the efforts of the Society for the Protection of Prespa, a locally-based non-governmental organisation. It is concluded that agriculture, stockbreeding and wetlands can still offer a lot to the local economy and cultural values of the area, provided that no more precious knowledge is lost, principles concerning future activities are mutually agreed, and active measures are extensively put into effect.

Keywords: Farming, animal husbandry, agro-biodiversity, cultural values, wet meadows, transboundary protected area

Introduction

The development of agriculture, that is the gradual domestication and controlled use of cultivated plants and domestic animals, is a result of human efforts to survive on Earth. It formed the basis for the development of civilisation, and is therefore considered the mother and provider of all the sciences and arts (Sfikas,
1988). Historians place agriculture’s first steps in Mesopotamia some 10-12,000 years ago (Sfikas, 1988; Scherf, 2000). From the collection of parts of plants to fulfil their needs, farmers advanced to the domestication of plant species through cultivation. With the evolution of science and technology, farming has progressed at an extremely rapid pace in recent centuries: agricultural research began in the nineteenth century, based on botany (physiology, ecology, and genetics), chemistry and physics, while agronomy became a science in its own right at the beginning of the twentieth century (Sfikas, 1988).

Livestock breeding began in the eastern Mediterranean between 10,000 and 6,000 BC, first with sheep and goats and later with cattle; by the Bronze Age (3000 BC), it had already spread to the western part of the basin (Papanastasis, 1997). On a worldwide level, animal domestication, the result of the breeding and selection efforts of farmers over thousands of years and in various conditions, has resulted in the development of several thousand domestic animal breeds, each adapted to specific environmental and farming conditions and each representing a unique combination of genes (Hoffmann and Scherf, 2006). These breeds, along with preserved old plant genetic material, are basic elements of agro-biodiversity which still has a lot to offer mankind, especially after consecutive crises in the food security sector over the last decades, and the persistence of hunger and poverty (FAO, 2007). Interestingly, the conservation of agro-biodiversity, apart from its role in a moral commitment to future generations, is regularly linked with cultural interests; the term ‘breed’ is often accepted as a cultural concept rather than a biological or technical term or physical entity (Hoffmann and Scherf, 2006; FAO, 2007), while preserving animal genetic resources contributes to cultural heritage (Notter, 1999).

Wetlands have been very important for the development and sustenance of cultures through human history: they are a source of countless plant and animal products (e.g. wild rice, fish, crayfish), water, hay and herbage for livestock, peat (used as a source of energy or for horticultural purposes), timber, tannin and construction materials (e.g. reeds and mud used for wall construction, fences and thatched roofs) (Mitsch and Gosselink, 2000), all of which have supported the presence of humans in and around wetlands (Papayannis, 2008).

However, over the centuries of human history, the relationship between agriculture (mainly in its plant production form), animal husbandry and, especially, wetlands has not been a peaceful one. In many cases, agriculture has exerted severe pressure on both stockbreeding and wetlands, primarily by occupying the most productive soils. Major wetland drainage works have been undertaken all over the world to create and expand arable lands, with a direct impact on wetlands which have been destroyed, damaged, reduced in size or fragmented (Mitsch and Gosselink, 2000). In Greece, wetland losses (63% of the original area lost over the twentieth century, i.e. 300,000 ha) have been caused by agriculture and the needs of electricity production from hydro-power, industry,
housing and tourism (Psilovikos, 1992; Gerakis and Tsiouris, 2010). Similar processes of transforming rangelands and pasturelands, mainly in lowland areas as well as near wetlands, along with the mechanisation of agriculture and the implementation of specific agricultural and forestry policies, has impacted on stockbreeding by forcing it away from the lowlands. Consequences have included the altering of breeding practices and a reduction in the numbers and types of domesticated breeds (Papanastasis, 1997; Pyrovetsi and Karteris, 1986; Vrahnakis et al., 2010).

The Prespa Park, the first transboundary protected area in the Balkans, was established in 2000 and covers the Prespa Lakes basin on the borders of Albania, Greece and the Former Yugoslav Republic of Macedonia. It is an area where conflicts between agriculture, wetlands and stockbreeding have occurred in the relatively recent past. Over the past fifteen years, however, the relationship between the main primary production sectors and wetlands has formed the basis for regular collaboration and joint efforts with local stakeholders aimed at the well-being of the inhabitants and a good conservation status for protected species and habitats. The present paper highlights some of the efforts undertaken in support of these two objectives through the work of a non-governmental organisation, the ‘Society for the Protection of Prespa’ (SPP). This mainly concerns the SPP’s longest-running project: the restoration of wet meadows adjacent to Lake Lesser Prespa. Along with a multitude of other projects carried out by the SPP, and consistent with its site-specificity, this project has involved the establishment of essential links with local society and stakeholders, and has contributed to the more general aims of conserving the natural and cultural values of this distinctive area.

Farming and wetlands in the Prespa landscape today

The unique landscape of the Prespa basin (1218 sq km), comprising two large high altitude lakes (48 sq km and 260 sq km at 853 and 843 m a.s.l. for the Lesser and Greater Prespa lakes respectively), a variety of wetlands, farmland, settlements of exceptional architectural interest, subalpine grasslands, forests and mountains reaching 2420 m a.s.l., is unquestionably the most prominent feature of the area, complemented by exceptional biodiversity and cultural heritage (Fig. 3.2). Significant components of this landscape have been shaped by humans, whose presence in Prespa dates from the Bronze Age (Catsadorakis, 1995). In many cases, human activities have had a positive impact, helping to maintain the diversity of landscape and wildlife. For example, stockbreeders and fishermen maintained wet meadows on the shores of Lake Lesser Prespa by keeping them free of high emergent aquatic vegetation, benefitting wetland biodiversity. The cultivation of cereals on small terraces up to 1800 m a.s.l. was beneficial for many bird species such as the partridge (Perdix perdix) and the short-toed lark (Calandrella brachydactyla), which are currently endangered due to the aban-
demonstrates this practice in particular, and to an intensification of farming in general (Catsadorakis, 1997). Major land use changes have taken place in the area, however, and continue to take place, though on a smaller extent. These mainly concern land reclamation projects (in specific periods between 1935 and 1987), building, quarrying and road construction on the Greek side (Catsadorakis and Malacou, 1997); works to create croplands and alterations in the hydrological regime of streams in parts of the area in the FYR of Macedonia; and other hydrological interventions in wetland areas (1953, 1969-2000; Hollis and Stevenson, 1997), excessive logging, overgrazing and excavations on the Albanian side. The dumping of garbage, solid waste, agro-chemical containers and unsold products (such as beans and apples) occur at various localities, including streams and lakes, in all three jurisdictions. Nevertheless, due to the localised nature of many of the impacts referred to above and to the area’s geomorphology and the diversity and extent to which its natural habitats remain in good condition, the overall landscape remains remarkably beautiful.

Fig. 3.2 Lake Greater Prespa as seen from the Greek village of Lemos.

Today, agriculture is the most important economic activity on all three sides of Prespa: both intensive (1000 ha) and organic (45 ha) bean cultivation in the lowlands of Greek Prespa, intensive apple production in the FYR of Macedonia, and subsistence farming with small-scale multi-crop production along with traditional livestock breeding on the Albanian side. Fishing, forestry and tourism are significant sources of income for particular communities around the lakes in all three countries. Stockbreeding on the Greek side is mainly concentrated in the highlands, with extensive cattle-breeding dominating the eastern part of Prespa National Park, and sheep and goat breeding predominating in the western part. Transhumance, a traditional activity with a long history in the mountains in the eastern part of the Park, has dramatically reduced in recent years. By 1997,
only six families were keeping sheep and goat herds (comprising 1500-2000 animals) on the subalpine grasslands of Mt Varnous in summer and returning to Thessaly in winter, while today only one family (with 300 animals) still uses the same areas. Lakeside areas around Lake Lesser Prespa are grazed by three herds of cattle belonging to local stockbreeders and by one herd of water buffalo belonging to the SPP. In the Albanian part of Lake Greater Prespa, 400-500 dairy/beef (and working) cattle of the local shorthorn breed are kept (Grunenfelder, 2006). These form an invaluable genetic resource of hardy animals which are exceptionally well-adapted to local environmental conditions. Part of this population is currently being monitored by animal husbandry experts, and local cattle-breeders are given assistance to maintain pure-bred males and avoid cross-breeding with non-indigenous breeds. Shorthorn cattle accounted for 95% (1450 head) of the total bovine population in the Greek part of Prespa in the 1960s (Catsadorakis and Malacou, 1997), and were bred until recently in the village of Psarades, where fewer than 10 pure-bred animals now remain (Kazoglou et al., 2010). Cattle of the related ‘Busa’ breed (200 head) were present in the FYR of Macedonia part of Prespa near the Albanian border until 2004, when they were all sold outside the area (SAVE, 2006).

Discovering links and resolving problems between agriculture and wetlands in Prespa by restoring wet meadows

The restoration of wet meadows in the Greek part of Lake Lesser Prespa has been a priority for the SPP since its establishment in 1991. The loss or deterioration of extensive wet meadow areas adjacent to the lake has occurred for the following reasons (Catsadorakis and Petrides, 1986; Hollis and Stevenson, 1997; Catsadorakis and Malacou, 1997; Kazoglou et al., 2001; Kazoglou et al., 2004a):

− the diversion of the Aghios Germanos stream from Lake Lesser to Lake Greater Prespa (in 1935-1945) to avoid floods and create agricultural land, which led to the loss of an extensive delta-like ecosystem with shallow waters;

− the construction of an irrigation network in three phases beginning in 1965, as a result of which significant wetland areas have been converted to agriculture land;

− the prohibition of reed-bed management since the 1970s in order to protect rare birds nesting in the reed-beds. Although beneficial for the nesting of pelicans and herons, this action had a negative impact on feeding birds and the reproduction of the phytophilous carp (*Cyprinus carpio*), as it allowed reed-beds to expand into seasonally flooded areas. Although conservationists proposed to the Greek government that selected areas of reed-beds be burnt or cut on the basis of a management plan, a total ban on burning has been imposed as a management measure in Prespa National Forest;

− the trend towards bean monoculture by local inhabitants in the mid 1980s, which brought about drastic changes to traditional activities which had for-
merly taken place in the wet meadows (grazing, reed cutting and fishing in shallow waters).

In the Albanian part of the lake, wet meadows have almost been eliminated due to sediment deposition from the River Devoll, which was seasonally diverted into the lake from 1953 until 2000. Gradually, and in the absence of traditional management, reedbeds have taken over the lake (Pano et al., 2000) covering an area of more than 3 sq km (Fig. 3.3).

Fig. 3.3 The Albanian part of Lake Lesser Prespa.

From 1991 to 1996, the SPP investigated ways of re-introducing active wet meadow management based on local experience (e.g. the effective grazing regime on the island of Aghios Achilleios and at summer-mown sites) and published material and scientific expertise provided by its member organisations. On-site implementation of reedbed management to restore wet meadows required considerable thought by the SPP because: (a) interventions would have to take place in the core of the National Forest/Park, (b) there was a need to develop scientifically-based arguments to demonstrate the effects of management on vegetation and target species, and to propose a detailed plan, and (c) the local people were not totally convinced about the scope of such an effort. By late 1996, the SPP had obtained permission to use a communal lakeshore site for trialling the process, and drawn up a specific experimental plan (Kazoglou et al., 2004a).

The experimental phase of the project (1997-2001) was very productive:

(a) Water buffalo, a domestic species perfectly adapted to the wetland conditions, were re-introduced into the area after an absence of more than thirty years (Catsadorakis and Malacou, 1997) in order to study the effects of grazing and its potential for controlling high emergent helophytes on seasonally-flooded littoral
sites; (b) buffalo grazing, annual summer cutting and the combination of the two proved very effective methods for restoring wet meadows and for their long-term management; (c) the trial site was regularly used by feeding aquatic birds, including pygmy cormorants (*Phalacrocorax pygmeus*), Dalmatian pelicans (*Pelecanus crispus*), herons and reproducing carp (Kazoglou et al. 2004b); (d) the SPP project team gained valuable scientific knowledge and practical experience from managing the water-buffalo herd and reed-beds, as well as by implementing relevant monitoring activities; (e) based on the successful experiment, a management plan was produced (Kazoglou et al., 2001), the first of its kind in the country approved by the state forestry services; (f) discussions among local stakeholders on water-level management issues began; and (g) a study was produced on the effects of high lake water levels on low-lying farmland plots affected by these levels in spring: i.e. when levels are relatively high and wet meadows become flooded, these fields cannot be cultivated (Giannakis et al., 2001). On the other hand, high water levels are needed to store water in the lake for irrigation purposes, a fact which is also directly linked to the efficient operation of the pumping station. In brief, high water levels in spring negatively affect less than 10% of the total surface area of cultivated lands (‘affected plots’), while they benefit other related features (e.g. flooded wet meadows and associated wildlife) and the stakeholders involved (other land owners, the local land reclamation service, fishermen and stockbreeders).

The next phase of the SPP project concerned wet meadow restoration on a larger scale. Based on the outcomes of the previous phase, and taking into account the European Action Plans for the Dalmatian pelican (Crivelli, 1996) and the pygmy cormorant (Crivelli et al., 1996) as well as ongoing procedures for the organisation of the transboundary Prespa Park, a project proposal was submitted to the LIFE-Nature funding mechanism of the European Commission in September 2001 with the support of the local, regional and national authorities. The proposal, entitled ‘Conservation of priority bird species in Lake Lesser Prespa’, was approved in April 2002, and the LIFE project began in July 2002.

With this project (2002-2007), wet meadows were restored and managed over an area of more than 70 ha, thus tripling their total area (estimated at 32 ha in the year 2000) to 100 ha around the perimeter of Lake Lesser Prespa, through the following main actions:

i. Water management and monitoring. The old-fashioned and run down sluice at the only surface outflow of Lake Lesser Prespa into Lake Greater Prespa was reconstructed in 2004 (after severe damage caused by excessively high water outflows in 1999), allowing for efficient control of the water level of Lake Lesser Prespa and sustainable water management. With the new sluice, a water management and monitoring system was put in place, while a decision-making process has been developed which allows for the participation of all the local and regional stakeholders in water management through the operation of a Wetland Management Committee (WMC) operating under the
auspices of the Management Body of Prespa National Park (MBPNP). The entire sluice reconstruction process lasted only eighteen months—a real record for a technical ‘public-like’ assignment in Greece—and included: (a) the calls for tenders for the production of the necessary technical, hydrological and environmental impact assessment studies, as well as for the construction itself, (b) the approval of these studies and the issuing of permits by the relevant state authorities, and (c) the actual hydrological and road-bridge technical works implemented in July-November 2004, including a one-month delay in summer due to the discovery of World War II and Greek Civil War shells (Kazoglou et al., 2006; G. Parisopoulos, personal communication, 2010).

Following the law for such works carried out on public land, the implementer of the re-construction, i.e. the SPP, donated the new sluice-road-bridge to the Greek state in May 2005. Overall, the reaction of the inhabitants to the new sluice—i.e. a tangible, obvious, very useful and costly structure—was very positive; this was a very good way of showing the inhabitants that the ‘local ecologists’ do care about human needs in the area as well as wildlife conservation. For the SPP, this was a fairly demanding project, and its accomplishment well before the end of the LIFE project can definitely be considered a success.

ii. Vegetation management by means of buffalo and cattle grazing, summer cutting (Fig. 3.4), in which local farmers participated, and a combination of the two methods at eleven lakeshore sites, plus monitoring of vegetation characteristics at the managed sites. Water buffalo have not only been highly useful in restoring wet meadows on reed-dominated sites, they have also become a source of interest for both visitors and local inhabitants. The former are enthusiastic about finding out about the SPP re-introduction programme and watching the buffaloes grazing in the wetlands; the latter often express an interest in undertaking the management of the herd but, to date, the lack of sufficient EU subsidies for that kind of stockbreeding seems to have put a stop to further consideration. Apart from the issue of low subsidies, they are also inhibited from exploring the potential of such an initiative by two main business and social factors: (a) the theoretical risks involved in entering new markets (e.g. for buffalo dairy products and meat), although developments in the Greek market would indicate that both have good prospects, and (b) the low esteem for stockbreeders in general, as a result of negative attitudes which have emerged over recent decades in Greek society and of the lack of positive messages sent out to counter these by the education system of a country with a very long stockbreeding tradition.

iii. Bird monitoring, an essential component in the project, allowed the effect of the above actions on the target species to be evaluated. Many breeding and migrating waterbird species were found to use the restored wet meadows (Fig. 3.5). Among them, the following records confirmed that restoration had a significant effect on wetland wildlife (SPP, 2007; SPP, unpublished data): (a) the return of the glossy ibis (*Plegadis falcinellus*) to breed in the reed-beds of Prespa.
(in 2005 and 2007, as well as in 2010) after 35 years of not breeding in the area, following the shrinkage of wet meadows in the 1970s and 1980s (Catsadorakis, 1997); (b) the immediate reaction of the local greylag geese (*Anser anser rubrirostris*) to vegetation management by feeding in the newly created or restored wet meadow areas and breeding in adjacent reed-bed sites (which had never previously been used for this purpose); (3) the probably occasional but proven breeding of bitterns (*Botaurus stellaris*), a rare species usually found in lowland coastal wetlands which is now the eighth heron species breeding in Lake Lesser Prespa. From a purely human conservationist point of view, such responses on Nature’s part are the best reward for years of conservation efforts.

iv. The operation of a scientific committee manned by specialists in hydrology and wetland management and monitoring.

v. The dissemination of the project results and information on the ways in which it has brought benefits to the area. The SPP public awareness campaign focused on highlighting the increase of lakeside grazing lands and fodder produced from wet meadows, the expansion of spawning grounds for the commercial carp (a fact often confirmed by local fishermen), the improved infrastructure and procedures for water management that take irrigation and nature’s needs into account, and the opportunities to organise ecotourism and nature interpretation activities based on the functions and values of wet meadows.

vi. The production of a comprehensive wet meadows management plan for 2007-2012 (Malacou et al., 2007), on which all wetland management and monitoring activities are currently based.

vii. Following the guidelines set out in that plan, the WMC evaluates wetland management activities and sets targets for the following year. Decisions on difficult and controversial issues such as the management of maximum spring water levels are taken by the Board of the MBPNP. With regard specifically to water management, this body has to take into account both local needs (e.g. flooding wet meadows in spring which should be coupled with resolving the problem of the ‘affected plots’), and transboundary aspects, since the waters of Lake Lesser Prespa are shared with Albania (where local inhabitants are in favour of high water levels in spring) and feed into Lake Greater Prespa (shared by the three neighbouring countries) which, in turn, provides large volumes of water to Lake Ohrid (shared by Albania and the FYR of Macedonia). These approaches are innovative in the Greek context and can offer a good example of integrated wetland management for other protected areas. One of the most important aspects of such joint work is that on-site wetland management in Lake Lesser Prespa and efforts to resolve related problems are ongoing and did not stop with the end of the relevant projects described above. As a result of good performance, in June 2009, the SPP LIFE-Nature project (2002-2007) –and through it the whole of Prespa– was selected by the European Commission’s LIFE Unit as one of the five ‘Best of the Best LIFE-Nature projects’ completed in Europe in 2007-2008.
Priorities for future activities

After almost twenty years of initiatives, preparatory work, effective on-site actions and collaboration among stakeholders, conservationists and local people, valuable knowledge on wetland management has been obtained. Management of wet meadows at Lake Lesser Prespa has showed that positive results can be achieved by systematic work and co-operation; reviving traditional farming activities, together with acquiring necessary infrastructure and establishing participatory procedures, has resulted in the restoration of a very valuable natural habitat related to many human activities in the area. These achievements have
prepared the ground for future action. In brief, the following actions should be undertaken:

– Continued management of wet meadows by means of proper water and vegetation management following the concept of ‘adaptive management’ for the benefit of the wider protected area, along with monitoring and the dissemination of results. The responsibility for securing funds for this purpose falls primarily to the MBPNP.

– Implementation of such management in other parts of the Prespa Park; e.g. in the Albanian part of Lake Lesser Prespa, where the SPP is currently participating in a pilot reedbed management project in collaboration with local stakeholders (Kazoglou et al., 2010).

– Support for grazing by water-buffaloes and cattle (if possible of the local short-horn breed) as a component of wet meadow management in order to promote the integration of stockbreeding and nature conservation, plus support for environmental education and nature interpretation activities based on that combination. At the same time, water buffalo and cattle breeding efforts in the littoral zone should focus on their performance as sound commercial, profit-making activities despite its difficulties. In relation specifically to the current buffalo grazing regime, the SPP should maintain its herd as there seems to be no real interest from local farmers in undertaking this activity.

– Establishment of mechanisms to link local agricultural and animal products to the market, preferably under an environmental site-specific labelling scheme for ‘Prespa Park products’ with traceability provisions (an issue on which the SPP and the MBPNP have undertaken significant preliminary work). In this context, documenting traditional knowledge on the production of local products would be helpful.

– Promotion of organic farming, or at least of an integrated production management scheme, in both the plant and animal production sectors; experience on this issue highlights the need to support farmers with regular agronomic advice and assistance in marketing their products.

– Swapping the ‘affected plots’ for municipal lands; alternatively, the MBPNP could purchase and manage them in accordance with agri-environmental schemes.

On a broader scale, agriculture and stockbreeding along with fishing, forestry and tourism activities should be maintained in the area, as it seems unsafe to abandon primary-sector activities in Prespa. Catsadorakis and Malacou (1997) link the balance between primary-sector activities and tourism with retaining the area’s authenticity and high biodiversity. Additionally, land uses should be determined and agreed in the Greek, Albanian and FYR of Macedonian parts of Prespa (with wetlands receiving high attention), while studies and pilot efforts aiming at the diversification of agricultural production should be encouraged. In the midterm, farming in the Prespa Park should develop a clearly environmentally-friendly
character in accordance with the latest definition of the term ‘agriculture’ (Gerakis and Tsiouris, 2010) in co-ordination with effective management of wetlands.

References


Kazoglou, Y. E., Mesléard, F. and Papanastasis, V. P. (2004b), Water Buffalo (Bubalus bubalis) Grazing and Summer Cutting as Methods of Restoring Wet Meadows at Lake Mikri Prespa,
Greece, European Grassland Federation, Zurich, Switzerland, vdf Hochschulverlag AG an der ETH Zürich, Vol. 9, 225-227.


SAVE (2006), Prespa Cattle in the Greek-Albanian Border Area, Konstanz: SAVE (Safeguard of Agricultural Varieties in Europe) Foundation.


3.2 Fishing and aquaculture

Fishing and aquaculture are activities which have been carried out within the core of wetlands since ancient times. They are however having an increasing impact on biodiversity. Initially, fishing consisted of various forms of harvesting which only impacted on the populations of fish, mollusc and crustacean species concerned. Gradually, however, fisheries management measures were developed for maximising fish catches or for countering negative developments (such as incidents of pollution, high eutrophication or dramatic changes in water salinity). These measures included water management for salinity, water levels and quantity, dredging to increase depth or to construct channels, and fish-catching installations; most of these have become part of the fisheries traditions and have –like the vallicoltura system in Italian lagoons– maintained strong associated cultural values. Of course, they have often also had a serious impact on wetland conservation.

As fish stocks in wetlands declined due to a number of factors including overfishing, water pollution and –recently– climate change, more debatable methods were used, including the introduction of alien species, frequently with negative ecological results. Aquaculture was also promoted, an intensive activity that can cause multiple and serious problems to wetland ecosystems.

Ramsar Guidance

To maintain traditional fishing practices in wetlands and their cultural aspects within a framework of sustainability, the Ramsar Guidance provides the following advice (Ramsar Guidance, p. 52):

**O.2.3.1 – To record and maintain sustainable traditional fishing methods in wetlands**

To avoid the loss of traditional fishing practices, the following actions are suggested:

a) record and document traditional fishing practices, including boats and gear, and make the resulting information available to the public through publications, films and exhibitions;

b) where fishing is an integral feature of protected wetland sites, favour traditional sustainable fishing methods, rather than intensive mechanised methods;

c) encourage the consumption of wetland fish caught through traditional methods by incorporating them in culinary products related to eco-tourism; and

d) explore the potential for sustainable sport fishing activities in wetlands, through local initiatives using traditional methods.
A number of points could be clarified and/or strengthened in this advice.

First, it is not clear how traditional sustainable fishing methods in wetlands could be promoted over intensive mechanised methods, unless it is done through financial incentives and disincentives, which may not be feasible or permissible in some circumstances.

Second, the development and intelligent marketing of quality fish products may facilitate their incorporation into ecotourism practices, but also into mainstream markets. As the Orbetello Lagoon case study has demonstrated, products of this sort produced using traditional and organic methods, and enhancing their cultural aspects, can render traditional fishing practices viable.

Finally, promoting sports fishing through traditional methods seems a very promising idea, but needs to be developed in close collaboration with lagoon fishermen co-operatives. Perhaps Italy would be an appropriate country for such an initiative, due to its rich fishery traditions.

**Case studies**

The lagoon fisheries of northern Greece are examined in a paper by Manos Koutrakis, from the Fisheries Research Institute of the Hellenic National Agricultural Research Foundation. Lagoon fisheries are managed by fishing cooperatives: traditional organisations that can be traced back to at least Byzantine times. The abundance and feeding habits of fish fauna are used as indicators of the health of the estuarine ecosystems, leading members of the co-operatives to protect the lagoons against potential dangers. This practice, combined with their collaborative way of working, maintains local knowledge and traditions, while guaranteeing a fair income for all.

The Amvrakikos wetland complex in western Greece—a major Ramsar site—is another case study related to fisheries. Vassilis Spyratos has based his paper on an AgroParis Tech-ENGREF Post-Masters degree dissertation providing a strategic analysis of the environmental management of the Amvrakikos wetlands. The threats and opportunities for synergy in the newly-created Amvrakikos National Park are described, and information is provided on the cultural and natural wealth of its nationally important fisheries and the associated biotopes.

Mario Lenzi, from the Lagoon Ecology and Aquaculture Laboratory of the Orbetello Pesca Lagunare Company in Italy, describes how the relationship between the Orbetello Lagoon and its human users has evolved over time and how people have adapted their usage methods to safeguard the integrity of the wetland. In this case study, the interdependence among local traditions, environmental protection and economic activities is clear and the local fishermen have managed to reverse negative trends and find solutions to the benefit of the natural environment and their own income.
Fisheries in the lagoons of northern Greece: cultural aspects and indicators of biological integrity

Manos Koutrakis

Abstract
The lagoons of northern Greece in which fish stocks are exploited are mainly found between the estuarine systems of the rivers Evros and Nestos. They are managed by fishing cooperatives through the use of permanent fish entrapment devices (barrier fish traps) combined with fish wintering channels. To date, the fish production management activities within the lagoons have been based on experience and tradition; co-operatives still retain a traditional organisation which can be traced back to at least the Byzantine period (after 800 AD). The co-operatives’ catches are collective property and are sold locally, but also to distant markets abroad. This collaborative way of catching and selling fish is very advantageous to the fishermen and ensures a fair income. The commercial fisheries depend on the migrant species, mainly grey mullet, which enter the lagoons to feed and shelter and are caught in the fish traps during their reproductive migration into the sea in the autumn and early winter. Local fish fauna can be used as an indicator of the lagoons’ environmental quality; the presence, abundance and feeding habits of the fish fauna are indicative of the ‘health’ of each estuarine system. The exploitation of fish stocks in a lagoon could be a crucial tool for its conservation, since the local communities involved protect the lagoons against the development of potentially damaging activities.

Keywords: Lagoons, fishing, cultural aspects, traditions, commercial fish species, grey mullet, indicators of biological integrity

Introduction
Mediterranean lagoons are important for fisheries and for extensive and intensive aquaculture. They contribute significantly to the fishery economies of many countries. In Greece, the exploitation of fish stocks in coastal lagoons was the first type of applied aquaculture, and it has been practised since antiquity. The lagoons in Greece cover an area in excess of 45 000 ha. There are two main types of lagoons –open and closed– distinguished by the extent of the lagoon/sea exchange area. Not all lagoons are exploited commercially, however. Between 700 and 1600 tonnes of fish are landed per year as a result of fishing and extensive aquaculture activities in 56 lagoons (21 on the Aegean and 35 on the Ionian
coast) with a total area of 354 sq km (Economidis et al., 2001). The majority of these lagoons are located in northern Greece in the Region of East Macedonia and Thrace between Alexandroupolis and Kavala, and in western Greece from Patra to Igoumenitsa (Amvrakikos Gulf lagoons, Messolongi-Aitoliko lagoons). Some of these lagoon systems, such as the Messolongi-Aitoliko lagoons (11 000 ha), are among the largest on the northern Mediterranean coast.

The lagoons of northern Greece

The lagoons of northern Greece are of the ‘closed’ type. They cover more than 115 sq km and are found mainly between the estuarine systems of the rivers Evros and Nestos. Lagoons where exploitation of fish stocks occurs, however, cover less than 86 sq km with catches ranging from 400 to 900 tonnes per year (i.e. 4.5-11 tonnes per sq km per year), which is the highest rate in Greece. Four big lagoon complexes are located in this area: the Evros River Delta Lagoons, the Rodopi Lagoons, the Porto Lagos Lagoons and Lake Vistonis, and the Nestos River Delta Lagoons. The remaining northern Greek lagoons are small and are generally not commercially exploited.

The Evros River Delta

The main lagoons in the Evros River Delta are the Monolimni Lagoon (which yields fish catches of 4.2 t/sq km/y) and the Drana Lagoon. The Drana Lagoon was exploited for fishing until 1986 (producing 8-20 t per year, 1974-1986), but was drained illegally in 1987 by local farmers who believed that the lagoons’ saltwater was affecting the adjacent cultivation. The lagoon was re-flooded in June 2004 (by opening a new 5 m wide entrance), when other restoration work was also undertaken (Fig. 3.6 and 3.7). The lagoon was not in an exploitable state by the end of 2005, since it had a very low abundance of commercial species (which migrate from the sea). This was probably due to the dynamics of the inlet, whose strong flood currents and limited ebb duration may have affected the entry of juveniles into the lagoon (Koutrakis et al., 2007a).
The Rodopi Lagoons

The Rodopi Lagoons consist of six lagoons covering an area of approximately 10 sq km: Fanari (also known as Xirolimni), Arogi (or Maurolimnion), Mesi (or Aliki), Ptelea, Elos and Limni. They all lie within the East Macedonia and Thrace National Park, and they are also a Ramsar site, Wildlife Refuge, Special Protection Area, Special Area of Conservation and an Important Bird Area. All the lagoons are shallow (average depth: 1-2 m). The six lagoons are exploited by fishing cooperatives (approximately 50 fishermen in total), and their total catches average 40 t/year.

Lake Vistonis and the Porto Lagos Lagoons

The third estuarine system is Lake Vistonis and the Porto Lagos Lagoons, which cover an area of 65 sq km. This system is also part of the East Macedonia and Thrace National Park and its biodiversity is protected by all the designations referred to above. However, the area is commercially as well as ecologically important with 400 t of fish landed per year in this area alone (i.e. 4.8 t/sq km/y based on data from 2005). Sand smelt (Atherina boyeri) is a species intensively fished in the Vistonis estuarine system. This small, euryhaline species has a high degree of osmoregulatory adaptability which enables it to inhabit coastal and estuarine waters over a wide range of salinities. Most of these fish remain in the vicinity of their spawning areas, resulting in semi-isolated populations, each with a characteristic morphology and life history. The sand smelt’s physiology allows its life history to adapt in response to the variable environmental conditions which are characteristic of coastal and lagoon habitats; it is thus pre-adapted for the exploitation of novel and vacant niches (Henderson and Bamber, 1987). During the 1980s, salinity in the southern part of Lake Vistonis increased due to a combination of seawater intrusion and limited freshwater inflow (Babajimopoulos and Antonopoulos, 1992). As a result, many freshwater species feeding on zooplankton and benthic organisms (e.g. Alosa vistonica, Cyprinus carpio) moved towards the northern part of the lake, leaving vacant niches in the southern part of the lake which were soon occupied by sand smelt. Since then, an abundant sand smelt population has developed which began to be commercially exploited in the 1990s. Today, sand smelt is the most important commercial species in the lake, representing more than 50% of its total fish production (200-400 t/y, Koutrakis et al., 2004; 2005).

The Nestos River Delta

The lagoons in the Nestos River Delta extend over an area of 9.5 sq km, and are also part of the East Macedonia and Thrace National Park. Seven of the lagoons (Monastiraki, Keramoti, Piges, Agiasma, Chaidefto, Erasteino, Vassova) are in the western part of the delta, and one (Erasmio) in the eastern part. Four of the west-
ern lagoons are exploited by a local fishermen’s cooperative, producing 180 t/y. These fishermen were the first to replace the stationary wooden fishing devices with cement ones in the 1980s, and to apply management strategies, such as efforts to improve water mobility in the lagoons by creating new connections and entrances (Tsihrintzis et al., 2007). These lagoons produce the highest annual tonnage of fish per sq km in Greece (e.g. Keramoti 23.3 t/sq km/y and Vassova 14.8 t/sq km/y) (Economidis et al., 2001).

**Cultural aspects of lagoon fisheries**

All the lagoons in northern Greece where fish stocks are exploited are managed by fishing cooperatives which exclusively use permanent fish entrapment devices combined with fish wintering channels. Nets are rarely used to catch fish. The permanent fish entrapment devices are barrier fish traps, meaning stationary installations that catch live fish as they move seawards. These devices used to be wooden composite installations, consisting of poles hammered into the lakebed supporting a net of reeds (Fig. 3.8). Most of these installations were replaced during the 1980s with cement installations that copied the Italian vallicoltura capture systems (Fig. 3.9). Wooden boats are still used on the lagoons, even if their use is restricted to moving around the lagoon or using nets on rare occasions.

The wintering channels are deep (5-6 m) dredged channels in which the juvenile fish spend the cold season. The channels provide protection for the fish when other parts of the waters freeze, which is a regular occurrence in northern Greece. The fish are not artificially fed in the wintering channels. Small-sized fish, which are not marketable or which are sold at very low prices, are also kept in these channels until they reach marketable size, or until they are released into the lagoon (Koutrakis, 2005).

![Fig. 3.8 and 3.9](image-url) Construction of traditional wooden traps in the Vassona Lagoon, Nestos Delta (1971, above left) compared with the cement installations found in the same lagoons of Nestos Delta today. These permanent fish entrapment devices catch live fish as they move seawards.
To date, fish production management activities in the lagoons have been based on experience and tradition (Mylona et al., 2007). The oldest of the fishermen’s cooperatives, such as the Lake Vistonis cooperative, still retain a traditional membership organisation which can be traced back to at least the Byzantine period (after 800 AD), when much of the exploitation of permanent fish catching installations, called *epohes*, was regulated by the central authorities (Patrologia Graeca 107, CIV, LVI-II).

In the present day, traditional cooperatives are headed by a president elected by the members of the cooperative who is responsible for the general organisation of labour, and the members abide by his decisions unquestioningly. The president organises fishermen into groups of 4-5. These fishermen occupy a hut near the entrance to the lagoon, with attendance rotating on a weekly basis. Each small group of fishermen has its chief, the *kapetanios*, who organises his group and their work. This basic arrangement has been common among fishermen in many Greek coastal lagoons for centuries (Guest-Papamanoli, 1985).

In the past, the fishermen’s work was very strenuous, involving the maintenance, repair and replacement of the reeds and wooden frames which form the stationary traps. Nowadays, maintenance and repair is much simpler as all the traps are cement installations with aluminium barriers. However, the system still presents its challenges: piscivorous birds, mainly cormorants (*Phalacrocorax carbo*), prey on the young fish that are kept in the wintering channels, causing considerable damage (they may consume as much as 200 t of fish between September and February). Thus, in addition to collecting and processing fish, covering the wintering channels with nets (Fig. 3.10) and scaring the birds away are major tasks for the lagoon fishermen.

![Fig. 3.10 Wintering channels in the Porto Lagos Lagoon, close to the entrapment devices, covered with nets in order to protect the young fish from piscivorous birds (mainly cormorants).](image-url)
The cooperatives’ catches are collectively owned and sold locally, but also – and mainly – to distant markets abroad. Italy, where fresh sand smelt fetch very high prices (Fig. 3.11) and where large quantities of eels are sold for the canning industry in the north, currently offers the best such market. The fishermen’s revenues take the form of a monthly salary and a share of the profit (after expenses are deducted) at the end of the year, which is distributed equally among them. This collaborative way of catching and selling fish is very advantageous to the fishermen and ensures a fair income. Moreover, it reduces conflicts among them, while diminishing the need for middle-men in the marketing of fish, thus ensuring higher profit margins. The role of the middle-men is an ongoing source of friction for the fishermen. Of course, this is an age-old issue: Attic comedies of the fourth and third centuries BC refer very eloquently to the discrepancy between the poverty of fishermen and the exorbitant profits of fish-sellers (Mylona, 2008; 75-90).

Fig. 3.11 Catching and collecting Sand smelt (*Atherina boyeri*), in Lake Vistonis.

The dependency of many local communities on the exploitation of the lagoon fish stocks is often reflected in the emergence of local customs and superstitions (Mylona, 2008; 70-74). The use of certain fish species as symbols of good luck is such an example. When the fishing season begins at Lake Vistonis at the end of August, fishermen look out for the first strange-looking fish to be caught. This is usually a deformed specimen (due to spinal problems) of a fish of the Mugilidae family known as the *kolaouzos*, meaning ‘the one that shows the way’. Its presence is considered good luck, and a young fisherman will climb up high and nail the fish, once it is dried, to the ceiling of the building where the fish are processed.

**Commercial fish catches: the importance of grey mullet**

Fish catches are related to species-specific inshore/offshore migrations influenced by seasonal or ontogenetic factors. Fish are allowed to enter the lagoons
to feed and shelter during spring and early summer, after which the entrapment devices are closed. During the summer, most fish remain in the lagoons. Most commercial species are caught in the fish traps during their reproductive migration to the sea in autumn and early winter. The fish fauna of Mediterranean lagoons can be divided into the following categories:

– resident species whose entire life cycle takes place in the lagoons (e.g. Pomatoschistus marmoratus, Aphanius fasciatus, Gambusia holbruci);

– migratory species which visit the lagoons at some stage in their life cycle for food, reproduction or shelter (e.g. members of the Mugilidae family, Dicentrarchus labrax, Sparus aurata); and

– species which occasionally enter lagoons for food or shelter (e.g. Sardina pilchardus, Boops boops).

Fig. 3.12 The preparation of the grey mullet’s roe (avgotaracho), a traditional product that constitutes an important source of income for the lagoon fishermen.

Commercial fisheries depend on the lagoons’ migratory species, which include the various species of grey mullet, gilthead seabream (Sparus aurata), European sea bass (Dicentrarchus labrax), sand smelt (Atherina boyeri) and eel (Anguilla anguilla). The largest catches are those of the grey mullet (Mugilidae: Mugil cephalus, Liza saliens, Liza aurata, Chelon labrosus, Liza ramada), which constitute 56% of total lagoon production in Greece. Grey mullet migrate to the sea, where they mature and reproduce one to two months later, depending on the species. Catches are most abundant in the autumn, with the September-October catches constituting almost 90% of the annual total. Annual catches depend on the abundance of the juveniles that have entered the lagoons, which in turn depends on the rates of reproduction at sea.

The quantity and quality of grey mullet from the lagoons of East Macedonia and Thrace was appreciated as early as Classical antiquity, when grey mullet from
this area had a good reputation. In the fourth century BC, Archestratos, an Italian tradesman, wrote *Hydipathia*, a kind of gastronomic guide (Wilkins and Hill, 1994), in which he praised the grey mullet of Avdira. Lake Vistonis, which was obviously the origin of these fish, was probably the ‘Lake Prassias’ of Herodotus (Herodotus, *Historia* Book V, 16). In the fifth century BC, Herodotus describes a Thracian fish-eating people who lived in lake dwellings built literally on the water of Lake Prassias. The lake was so rich in fish that they had only to throw a basket in the water through a trapdoor in their hut’s floor and pull it up full of fish a short while later. Fish were so abundant that they were also used as fodder for their animals (Mylona et al., 2007). We may safely assume that a large proportion of these fish were grey mullet.

A highly regarded grey mullet by-product is their roe in the form of *avgotaracho*, a traditional product which constitutes an important source of income for the lagoon fishermen (Fig. 3.12). *Avgotaracho* is made from the mature female ovaries of the Flathead grey mullet (*M. cephalus*), which are lightly salted and air-dried. It has a very high commercial value (about 130 €/kg) and the highest production has been recorded in the Messolongi-Aitoliko lagoon. Under the trademark ‘Avgotaracho Messolongiou’, this precious roe is one of nine products in the Fresh fish, molluscs, crustaceans and products derived therefrom category which the EU has awarded a Protected Designation of Origin (PDO) status under Greek and EU law. The annual production of fish roe in Greek lagoons is estimated to amount to 7% of the total weight of the flathead mullet caught during their spawning migration period (Katselis et al., 2005).

**Indicators of biological integrity in the lagoons**

Hydrology, including water quantity, quality, distribution and flow patterns, is probably one of the most important factors affecting the successful operation, management and/or restoration design of lagoons. Accurate hydrological, hydraulic and water quality computations significantly reduce restoration design risks. The improvement of aquatic lagoon environments is one of the purposes of EU Directive 2000/60/EC (Water Framework Directive, WFD), which defines qualitative, quantitative and ecological objectives in order to protect highly valuable lagoon ecosystems (European Union, 2000; Elliot and McLusky, 2002).

Initially, assessments of the quality of water resources related only to the impact of water pollution on human health. However, the alteration of landscapes by agriculture and urbanisation, the alteration of water flows by channel dredging, the diversion of fresh water for alternative uses, the overexploitation of biological resources and the proliferation of non-point sources of pollution, all put stress on aquatic systems in a wide variety of ways (Deegan et al., 1997). Fragile coastal lagoons and marshlands are especially susceptible (Katsadorakis and Paragamian, 2006).
Environmental indicators are a useful tool for studying and evaluating the fundamental condition of an environment by means of selected sample measures, without needing data on the full range of variables in the system (Harrison and Whitfield, 2004). An assessment of the ecological condition of a lagoon can be based on indicators of its physico-chemical characteristics and/or biological indicators. The EU has adopted both types of indicators for the implementation of the Water Framework Directive by Member States, in order to assess water quality according to different categories of ‘ecological status’.

Fish fauna can be used as an indicator of the environmental quality of lagoons. An implementation of this approach has been tested in seven lagoons in northern Greece using an Estuarine Biotic Index (EBI) adapted for Mediterranean estuarine systems. The EBI, which uses 12 indices derived from measurements of the presence, abundance and feeding habits of fish fauna, makes it possible to categorise estuarine systems according to their ecological ‘health’ (Franco et al., 2010).

Problems in fisheries management

The main problem facing lagoon fishermen is a decrease in catches. For several lagoons, landings over a 20 to 30 year time-series were analysed (Koutsikopoulos et al., 2004). The results show a clear trend of steadily decreasing landings in all lagoons, albeit with different patterns, including drastic changes (accidents or natural disasters) occurring over short time periods without obvious restoration, and increased inter-annual fluctuations. Other important problems include pollution due to agricultural activities and domestic sewage in some coastal areas, a shortage of freshwater input and the draining (partial or total) of certain lagoons, such as the Drana Lagoon in the Evros Delta. Erosion is also a potential problem in some coastal areas, since the strips of sand that separate many coastal lagoons from the sea are shrinking (Koutrakis et al., 2007b).

In northern Greece, low temperatures and the formation of ice on the lagoon surface during the winter impact negatively on the fisheries’ productivity. According to data from the meteorological station at the Fisheries Research Institute in Kavala (East Macedonia), ice formed on the surface of the northern lagoons during January or February in five of the seven years from 2000 to 2006, causing almost total fish mortality in practically all of these sites. Another problem, already referred to above, is the predation of fish in the wintering channels by cormorants. Finally, the efforts made by some fishing cooperatives to increase fish production in the lagoons has led to high-risk practices, such as the introduction of juvenile fish of unknown genetic origin (notably sea bream) from commercial hatcheries. The potential negative impacts of these practices have still to be evaluated (ibid.).

4 Escape of the fish by accident, constructions that failed to contain the fish, or toxic substances that enter the lagoon, etc.
The particular character of the lagoon ecosystems\(^5\) and the decidedly traditional, self-contained character of the human communities that live on and from the lagoons, have limited the amount of information available on the functioning and dynamics of these ecosystems and the needs of these communities (Koutsikopoulos et al., 2004). Nevertheless, it is apparent that there is less human pressure on lagoon ecosystems in those cases where well-established and productive fishing cooperatives exist, whereas other lagoons with no fishing or with unregulated fishing activities have suffered a rapid decrease in open-water area and environmental quality. It is clear, therefore, that the fishermen’s financial dependence on lagoons encourages them to participate in conservation efforts as well as doing what they can to protect lagoon ecosystems. This means that the presence of a fishery in a lagoon can be a crucial tool for its conservation when the local communities who exploit the fish protect the lagoons against the development of potentially damaging activities (Koutrakis, 2005; Koutrakis et al., 2007b).

References


Elliot, M. and McLusky, D. S. (2002), The need for definitions in understanding estuaries, Estuarine, Coastal and Shelf Science, 55, 815-827.


\(^5\) From, inter alia, the biological and oceanographic point of view.


Compatibility of tradition and economic development in the management of Orbetello Lagoon, Tuscany, Italy

Mauro Lenzi

Abstract
After outlining the ecological characteristics of lagoon environments, Orbetello Lagoon is described with a brief historical review of different customs that contributed to changing and conserving the lagoon while supporting human populations by fishing. Ecological problems over the last 30-40 years have largely been due to eutrophication caused by heavy human settlement of the coastal belt, culminating in the extended severe dystrophic crises of the early 1990s. The Italian government established an authority to manage the lagoon and endowed it with emergency powers. The environmental remediation measures applied are described along with assessments of their efficacy and bibliographic references. The contribution of the Orbetello Fishermen’s Cooperative to environmental quality, the relaunching of added-value fish products and commercial solutions for the wholesale market are also discussed. The restoration of environmental conditions and the economic solutions that have enabled fishermen to continue to make a living from fishing have saved social mechanisms on which environmental protection and local traditions depend.

Keywords: Orbetello Lagoon, eutrophication, restoration, lagoon management, lagoon economy, fish products

Fisheries in Mediterranean lagoons
Mediterranean lagoons, except those in the northern Adriatic, have low tides and silt up in a relatively short time (in historical terms). Poor exchange of water with the sea renders them susceptible to eutrophication, which makes them at least one order of magnitude richer in food resources than the sea, but condemns them to collapse relatively quickly. Structural eutrophy—and, sometimes, man-made hypertrophy, at least in its initial stages—sustain a rich variety of fish; indeed, lagoons have the highest known fish productivity of any environment. This abundance of fish made lagoons of great interest to early man, as did the fact that they offered safer fishing grounds than the sea: lagoons are shallow and sheltered from the open sea, making it possible to fish on them with simple, even rudimentary craft. The human settlement of lagoon areas goes back to ancient times, and the history of these areas is closely linked to that of humans. The seaward migration of adult fish for reproduction or to escape extreme lagoon conditions was
exploited by fishermen. Channels connecting lagoons to the sea were barred with canes or, in modern times, with aluminium grids that allowed juvenile fish to enter the lagoon against the current when the tide went out, and concentrated mature and intermediate fish between movable grids to provide a room capture when the tide came in (as juvenile fish instinctively swim towards the lagoon, and mature fish instinctively swim towards the sea). This method is a type of aquaculture that essentially consists of managing the fish stock entering from the sea to feed in a nutrient-rich environment. Lagoons have always been managed in this way, which considerably reduces the exchange of water with the sea and requires maintenance, principally to keep the channels open.

**Orbetello Lagoon and its historical evolution**

Orbetello Lagoon (southern Tuscany, Italy) is a eutrophic, shallow-water environment with low water turnover which consists of two communicating western and eastern basins. The lagoon is connected to the sea by three channels. Two are in the western basin, but since one opens directly onto the estuary of the Albegna River and is almost always silted up, the other shorter channel on the opposite side of a sandy spit provides most of the limited water exchange; the third, 1.5 km long channel is in the eastern basin and provides little water exchange with the sea.

![Fig. 3.13 The town of Orbetello in the centre of Orbetello Lagoon.](image)

Like many similar environments, Orbetello Lagoon has been a source of food for humans since prehistoric times. The Villanovans, a pile-dwelling people who lived by hunting and fishing and who were probably the ancestors of the Etruscans,
inhabited the area until 1000 BC. They are thought to have built the cyclopean walls that still encircle the town of Orbetello, which is built in the centre of the lagoon (Fig. 3.13). Between then and 300 BC, the Villanovans and then the Etruscans devised a system of fishing which, managing the passage of fish between the lagoon and the sea, is similar to that practised today. Then came the Romans who founded military garrisons and developed lagoon fishing and trade, exploiting the lagoons of Orbetello and Burano (which was much larger at the time). They developed the production of garum (a fermented fish sauce), which they exported as far as Massalia (Marseilles) in Gaul. Many peoples conquered this area, leaving material and cultural traces that mixed with the cultural substrate in customs, methods of food conservation, fishing tools and methods. The inhabitants of lagoon areas throughout the Mediterranean have much in common, as is clear from similarities in their fishing tools and boats. Orbetello enjoyed a period of historical and economic importance between 1559 and 1707 as capital of the Spanish Presidi, a military garrison ratified by the Treaty of Cateau-Cambrésis. Orbetello and its lagoon were at the centre of a well-defended area, with many stone forts and observation towers on rocky crags overlooking the sea. The local population and the Spanish occupying forces were on good terms with each other and mixed freely. This was the only place in Italy where locals and Spaniards fought side by side and acquired each other’s customs. There are still many surnames of Spanish origin in the Orbetello area today.

Deterioration of the lagoons

Environmental ‘transition zones’ of all kinds have suffered deterioration at the hands of human civilisation, first as a result of the impact of agriculture and industry and then as a result of post-industrial activities. It is difficult to say which of these two historical phases caused the greatest damage. Often, social changes induced by economic ‘development’ undermined the lagoon fishermen’s way of life, transforming the land as the old trades disappeared. There are very few examples of trades and activities that have modernised themselves successfully while remaining rooted in local biological productivity. The survival of transition areas depends on humans and their economic and commercial activities. Wetlands, especially coastal lakes and lagoons, are transition zones in a state of relatively rapid transformation, tending to lose their connections with the sea and to silt up. These environments can only survive if a community decides to maintain them; laws cannot save wetlands without the involvement of the population and strict conservation measures.

Lagoons have become problematic, especially in recent years: while ecological organisations want to protect the remaining migratory bird populations, hunters lobby to be allowed to shoot these birds when they concentrate in wetlands to feed or to spend the winter. Moreover, there are tensions between developers, mass tourism operators, shopkeepers, small entrepreneurs, hoteliers and those wishing to protect the landscape as a value and resource for a less aggressive type of tourism.
Over the past 30-40 years, coasts have suffered heavy human impact driven by industry, urbanisation and tourism, the last of which is concentrated into a few months of the year. Economic development has also had a heavy impact on lagoons through the input of nutrients and waste. Man-made eutrophication is accelerating degradation. Blooms of microalgae and the development of macroalgal biomass are a frequent problem (Morand and Briand, 1996).

**Problems with the Orbetello Lagoon**

Until the 1970s, the Orbetello Lagoon ecosystem was mesotrophic, richer in nutrients than the sea, but without excesses. Marine angiosperms were widespread and fish, especially eels, were abundant (Lenzi et al., 1998). However, effluent from domestic wastewater treatment plants and four fish farms flowing into the lagoon and the Albegna River (a tributary that drains a vast area of agricultural land) increased the system’s eutrophic status. High nutrient input in these years led to the increasingly frequent proliferation of opportunistic, fast-growing macroalgae (Bombelli and Lenzi, 1996; Lenzi et al., 2003). Traditional fishing using fixed nets and installations in seaward channels was hard hit, which is reflected in a sharp decline in the catch of eels (*Anguilla anguilla*) and mullet (*Mugil cephalus*) (Lenzi and Solari, 2002). This prompted the lagoon fishing company to begin intensive aquaculture of sea-bream (*Sparus aurata*) and sea-bass (*Dicentrarchus labrax*) in order to survive financially.

In an eutrophic environment with low water turnover—an environment common to most Mediterranean lagoons—the excessive proliferation of macroalgae is not controlled by primary consumers, due to the rapid turnover of vegetation. Thus energy does not flow in the grazing chain and most of the biomass ends up as detritus on the bottom. The detritus chain also suffers, since organic detritus accumulates too fast to become available to higher trophic levels. As a result of these bottlenecks, organic detritus accumulates in sediments, favouring anoxia, the sulphate-reductive mineralisation of organic matter, and ultimately dystrophic conditions (Fig. 3.14).

![Fig. 3.14 Possible management interventions at different levels of the lagoon ecosystem.](image)
What can be done to counteract the effects of eutrophication? The first step should be to reduce the external input of nutrients (Fig. 3.14, point 1), which is not always possible, especially when the area is intensively settled. In the case of Orbetello Lagoon, phyto-treatment ponds were built between the nutrient sources and the lagoon. These ponds reduced nitrogen and phosphorus in urban wastewater by about 80% (Fig. 3.15) after a mean residence time of about 30 days (Lenzi et al., 1998). Reductions of only 10-15% were recorded for fish-farm wastewater treatment ponds, because of low mean residence times ranging from 0.3 to 2.5 days (Porrello et al., 2003a,b, 2006; Gennaro et al., 2006). Local authorities later built a pressurised pipeline to dispose of treated urban wastewater offshore. This solution was not accepted unanimously, because the nutrients could upset the local trophic balance of the sea.

Another solution which was immediately implemented was the annual harvesting of algal masses (Fig. 3.14, point 2) using special boats. Harvesting only removed 5-10% of the major spring-summer macroalgal standing crop: four boats with a capacity of 2 tonnes each worked 8 hours a day, 6 days a week (Lenzi and Mattei, 1998; Lenzi, 1998; Lenzi et al., 2003) (Fig. 3.16). This biomass was disposed of in landfills after partial dehydration. Unfortunately, no industrial use has yet been found for it. Its low value makes handling and processing uneconomic.

Other solutions for preventing dystrophic crises were pumping sea water into the lagoon and excavating submerged channels which were intended to counteract
the accumulation of organic matter in the sediment, and to improve water column parameters (Fig. 3.14, point 3). Pumping was an effective but expensive management solution. It created a one-way current towards one of the outlets which counteracted stagnation in the lagoon centre. Submerged channels conveyed pumped water into central areas, and are thought to provide a refuge for wildlife during critical periods. However, since they clogged with organic matter, silt and clay faster than they could be dredged, after a few years the channels became sources of nutrients and hydrogen sulphide.

A purely biological management solution was to increase primary consumers (Fig. 3.14, point 4). Being low in the food chain, feeding on algae, small crustaceans, molluscs and organic detritus, grey mullet and sea bream could transfer energy that would otherwise enrich sediment with usable biomass. Sea bream fry were purchased and raised intensively in nets in a special pond until they weighed 80-100 g. They were released into the open lagoon in spring, where they could grow to commercial size (400-500 g) over 6-7 months while the fish-eating birds were absent. They were then caught in the fixed installations at the lagoon outlets. This system of combined intensive and extensive aquaculture is known as integrated aquaculture.

Environmental crises were especially severe in the 1990s, and the eel and mullet populations were decimated. Even after 15 years of remediation, the fisheries are not recovering, although the introduction of more than 500,000 bream fry has finally put fishing back on its feet and saved the fishing company. Bream has now become the main species, but the imbalance in fish populations indicates that the environment has still to be fully restored. Although the lagoon environment affects fish populations, the opposite is also true, and the fact that environmental quality influences lagoon populations and vice versa can be directed in a positive way by appropriate management. Work is currently being done on the introduction of grey mullet, a species which is more difficult to reproduce artificially, and whose fry are not commercially available. In their search for species that interact at low levels of the food chain, the researchers are also evaluating the possibility of introducing two allochthonous (Red Sea) herbivores: the rabbit-fish species *Siganus luridus* and *Siganus rivulatus*. These species consume macroalgae and could first be tested in the phyto-treatment ponds of the fish farms, where macroalgae are prolific. If compatible, they could be introduced directly in the lagoon. *Siganus* species are not of commercial interest, but once they have completed their ecological task as primary consumers, they could be transformed into fishmeal for fish farms. This would make intensive aquaculture more ‘eco-compatible’; it is currently energy-intensive and depletes marine fish stocks using fish-meal that could be consumed directly by humans. Integrated aquaculture has been welcomed by the fishermen of the Orbetello Fishermen’s Cooperative, but it has proved hard to dissuade them from introducing the fry of carnivorous fish,
such as sea bass, which command higher prices. This would be bad management, as carnivorous fish would cause a decline in primary consumers, decreasing the flow of energy from autotrophs to higher trophic levels and increasing the risk of dystrophic events.

Finally, Lenzi et al. tested an innovative sediment management system that influences nutrient release (Fig. 3.14, point 5). The resuspension of sediment occurs frequently in shallow lagoons where relatively large boats are active. It was found that these boats disturb the upper 5 cm of sediment (Lenzi et al., 2005). Sediment resuspension leads to the oxidative mineralisation of organic detritus, decreasing the risk of dystrophic events (Lenzi et al., 2010). During resuspension, orthophosphates are blocked as insoluble salts, and may be adsorbed by clays and carbonates and bind to ferric oxy-hydroxides (De Jonge and Villerius, 1989; Dodge et al., 1984; Golterman, 2001). The removal of orthophosphates limits the phosphorus available to algae, while the decrease in algae and reduced risk of dystrophic events favours the return of angiosperms, which are not limited by nutrients since they have roots.

The solutions applied have helped overcome the environmental crisis, to maintain a local economy based on fish, and to allow a traditional activity to continue, albeit with methods modified to combat eutrophication and in line with the changing fish market (the wholesale prices of bream and bass have halved in Italy since the 1990s). Besides adopting new methods such as intensive aquaculture to provide a quantity of fish beyond the natural limits of the lagoon, new tools for environmental management and research, and integrated aquaculture with its positive environmental effects, a new marketing approach has also been tried, with fishermen selling direct to consumers and fish processing being undertaken to add value to the final product.
Fish processing and products

In the history of Italy, human populations have often remained culturally isolated from the rest of the peninsula for long periods of time while maintaining contact with much more distant peoples by sea. This has led communities to develop traditions which are different from those of their immediate neighbours. It is therefore possible to find different methods of food conservation and processing among people living only short distances apart. In the case of Orbetello, the period of Spanish occupation introduced fish processing methods based on salting, smoking and preserving with chilli pepper which are unique in Italy. Products and preserving methods introduced by the Spanish include bottarga, salted and dried grey mullet (*Mugil cephalus*) roe, *anguille e cefaletti sfumati*, young eels (*Anguilla anguilla*) and small mullet (*Liza aurata*) preserved with hot chilli and tomato, and *scavecio di anguilla*, young eels fried and preserved in wine vinegar. Since the 1600s, these have been local, traditional products produced within the household or by local fishermen.

In the 1990s, the Fishermen’s Cooperative developed fish processing in the local tradition to add value to the two species, eels and mullet, that command lower prices and have depleted populations. A new process, the salting and smoking of grey mullet fillets, was also introduced (Fig. 3.17). This became necessary in order to make use of mullet from which roes had been removed to obtain bottarga, and for which there was no local or wholesale market. In Italy, it is not customary to sell gutted fish, and mullet is a niche product, much appreciated by connoisseurs who demand that the fish be very fresh and whole. Although not a traditional product, fillets of smoked mullet have proved very successful on both the local and national market.
Finally, another solution used to increase income and develop the cooperative in a rational way was to open a retail outlet for the local population and tourists, along with a restaurant specialising in lagoon fish and fish products prepared according to traditional local recipes.

This diversification has taken some of the risk out of the wholesale market, saved traditional activities and the lagoon environment, and allowed hundreds of fishermen to continue to make a living out of fishing. Knowing that transition areas can only survive if cared for and managed correctly, and that this is usually only feasible if it is combined with economic success, efforts have been made to find an economic formula that is sustainable in the environment on which it depends and creates a win-win situation.

References


Traditional fisheries and wetland conservation: threats and opportunities for synergy. The Amvrakikos case study, Greece

Vassilis Spyrratos

Abstract

The Amvrakikos complex is one of the largest and most important wetland areas in Greece, and one of the largest remaining areas of its kind in the entire Mediterranean. It sustains nationally important fisheries that are of major importance socially, economically and to the cultural heritage of the area. Important environmental pressures threaten the sustainability of some of the most important biotopes of the area and its associated fisheries, notably in the Amvrakikos Gulf and in the large lagoon complex of Rodia-Tsoukalio. The traditional fishing activities are intrinsically linked with the natural environment. The definition of management plans and regulatory measures in the framework of the recently created Amvrakikos National Park provides an important opportunity to build synergies for the mutual sustainability of the Amvrakikos wetlands and their associated fisheries.

Keywords: Amvrakikos, Mediterranean lagoons and coastal marine ecosystems, traditional fisheries, wetlands’ water needs

Introduction: the Amvrakikos case study

This paper is based on the results of an AgroParisTech-ENGREF Post-Masters degree dissertation in Water Management which provided a strategic analysis of the environmental management of the Amvrakikos wetlands, with an emphasis on the wetlands’ water requirements (Spyratos, 2008). The analysis was based on the collection and analysis of existing data and studies, combined with some 40 interviews conducted at a local, regional and national level with people in possession of relevant scientific, administrative, local and/or traditional knowledge.

Two major environmental issues have been identified in relation to two of the most important socio-ecological systems in the area: the Rodia-Tsoukalio Lagoon complex and the Amvrakikos Gulf itself. Important hydro-ecological alterations are threatening the sustainability of the ecological quality of the biotopes and the associated fisheries. Both threats appear to be linked to the alteration in water quality, and to the blocking of water circulation between adjacent wetlands and of the associated ecological interactions. This paper will present the Amvrakikos wetlands, their fisheries, the main threats identified and oppor-
tunities for synergy in ensuring the mutual sustainability of the natural and cultural values of the wetlands and their fisheries.

Natural characteristics of the Amvrakikos wetlands

Located on the western coast of Greece, the Amvrakikos Gulf is a vast semi-closed marine basin covering more than 400 sq km, with a maximum depth of 60 m. It connects with the Ionian Sea through a narrow and shallow channel with a maximum width of 600 m and a maximum depth of 10 m. The Amvrakikos drainage basin covers 3850 sq km, 70% of which corresponds to the basins of two main rivers, the Arachthos and Louros, with mean annual flows of 69 and 19 cu m/s respectively (Papayannis et al, 1986). The climate is of the Mediterranean type with abundant precipitation (860-1200 mm/year) (Hellenic Ministry of Environment, 1998).

The alluvial activity of the Arachthos and Louros rivers has contributed to the formation, in the northern part of the gulf, of one of the largest and most important wetlands in Greece, including notably the vast wetlands of Rodia-Tsoukalio and Logarou between the deltas of the Louros and the Arachthos. The Amvrakikos wetlands include large and small lagoons, coastal spits separating lagoons from the gulf, riparian zones, river deltas, salt-marshes, freshwater marshes, reed-beds, wet meadows and mudflats. Vegetation on the hills consists mainly of oak trees, while the plains are home to pasturelands, crops and the remnants of riparian forests.
Given a natural abundance of water and relatively low human pressure on the land, these vast and varied habitats support an extraordinary diversity of living organisms, including many rare and threatened species. The Amvrakikos complex hosts hundreds of thousands of birds every year, including 77 species listed in Annex-I of EU Directive 79/409/EEC (including Pelecanus crispus, Aythya nyroca, Phalacrocorax pygmaeus, Botaurus stellaris, Aquila clanga and Aquila pomarina), and 53 vertebrate taxa other than birds which are considered to be of international or national importance, 17 of which are listed in Annex-I of Directive 92/43/EEC, including a population of around 150 bottlenose dolphins Tursiops truncates and loggerhead sea turtles Caretta caretta (Hellenic Ministry of Environment, 1998; Heath et al., 2000).

Recognised as a wetland of international importance under the Ramsar Convention, the Amvrakikos complex is one of the most important areas for birds in Europe (Heath et al., 2000). It is also one of the most important fisheries in Greece (Oikos, 2003), and one of the largest remaining areas of its kind in the whole of the Mediterranean (Zalidis et al., 2006).

Most of the sensitive wetlands of Amvrakikos have been legally protected since 1990 by a set of management and protection measures established by the Joint Ministerial Decree 30027/1193/9-3-1990. An area of more than 235 sq km is divided into three environmental protection zones, and has been designated since 1998 as an EU Natura 2000 site under Directives 79/409/EEC and 92/43/EEC, and since 2008 as a National Park.
Cultural values and activities

About 5500 people live in the Amvrakikos Ramsar Site, mostly in small communities.

Fisheries constitute the main economic activity in the wetlands, with high social and cultural values. Lagoon fisheries have a relatively high production (688 tons in 1995), accounting for 40% of Greek production in the 1980s (Hellenic Ministry of Environment, 1998). Grazing, crop cultivation and hunting are also carried out in the Ramsar site.

Traditional stone buildings and churches, cultural associations and women’s traditional handicraft co-operatives are elements of the area’s contemporary cultural richness. Traditional celebrations (panigiria) are held in honour of each village’s patron saint, during which a religious ceremony is followed by traditional music, dancing, eating and drinking.

The wider area is home to a population of 76,000 people. The main activities in the area are intensive agriculture (partly irrigated), pig, cattle and poultry farming, urban development, aquaculture and forestry. The local population is mainly occupied in the primary production sector, with 9.8% employed in the secondary sector (in slaughterhouses, oil mills and cheese production units, for example) and 22.6% in the tertiary sector (Hellenic Ministry of Environment, Physical Planning and Public Works, 1998).

Human communities have been settled around the Amvrakikos Gulf since ancient times, and have left numerous archaeological, religious and historic build-
nings behind, notably the ancient cities of Nikopolis (on the tentative list of UNESCO World Heritage sites\textsuperscript{6}), Kassiopi, Amvrakia (modern-day Arta, the capital of Epirus under Alexander the Great), a number of fortresses, classical and Byzantine monuments, numerous churches and monasteries, traditional long-arched stone bridges, and a 50 km Roman aqueduct that carried water from the springs of the Louros River down to two cisterns in the \textit{Nymphæum} of Nikopolis.

The vast wetland ecosystems and traditional activities which have shaped majestic natural and cultural landscapes over the centuries remain relatively well-preserved today.

Overlooking Rodia Lagoon from Mavrovouni Hill, places of particular beauty shelter religious and sacred sites, such as the cave of the hermit St. Blaise (\textit{Ai-Vlassi}), formerly more easily accessible from the water than from the land, and the post-Byzantine monastery of Panagia Rodias, which is well-known for its wall-paintings. This monastery has an interesting link with the wetland: its guardians manage three small lagoons surrounding the Rodia Lagoon. They founded the Rodia Wetland Centre in 2002 to inform visitors about local wildlife, to organise guided wetland excursions and to promote an environmentally-friendly view of nature based on Christian principles.

In 2000, a successful re-introduction programme in the Rodia marshes brought water buffaloes back to the wetlands, and the herd, which had disappeared after the Second World War, nowadays numbers some 50 animals. Buffalo are an imposing sight and economically valuable, but their reintroduction was also motivated by their suitability for appropriately managing the reed-beds and wet meadows.

\textbf{Amvrakikos fisheries, yesterday and today}

The area’s most important social and cultural values are those associated with its fisheries (Hellenic Ministry of Environment, 1998; Haralambous, 2007b; Zalahori et al., 2001). The Amvrakikos wetlands sustain nationally important fish populations. Commercial fisheries in the lagoons and open gulf are traditional activities that have always been an important part of the social life around the gulf.

Visible signs of traditional fishing activities abound around the gulf. The typical wooden boats and traditional fishing equipment characterise and liven up the numerous wetlands and small harbours that surround the gulf. Fishing remains an important resource for coastal villages and communities, an important proportion of whose population is engaged in fishing in the gulf, rivers and lagoons. For example, a festival dedicated to the sardine, for decades the basis of the diet of Amvrakikos’ poorest people, is held in Preveza in late summer at which the ‘sardine dance’ is danced.

A number of traditional fishing tools and techniques are still widely used today.

\textsuperscript{6} whc.unesco.org/fr/listesindicatives/270/
In the gulf itself, fishermen use various kinds of nets (*apladia dyktia, manomena dyktia, dalania, syrti, garidodykta*), long lines (*paragadia*), traps (*helodivara and volkoi*, notably for eels and shrimps), fish lamps (*pirofania*) and spears (*kamakia*). The fishing fleet is composed mainly of traditional small wooden boats, although they have now been joined by motor-driven vessels, many of which are equipped with electronic bathometers.

The fished species include the sardine (*sardela*) and shrimp (*gampari-garides*), eel (*heli*), mullet (*kephalos*), striped mullet (*koutsomoura*), cuttlefish (*soupia*), squid (*kalamari*), sea bream (*tsipoura*), sea bass (*lavraki*), sole (*glossa*), garfish (*zargana*), greater amberjack (*magiatiko*), saddle bream (*melanouri*) and species of shellfish such as oysters and mussels (*streidia, mydia*). No fewer than 33 fish species live and reproduce in the Amvrakikos Gulf, some 15 of them are fished.

The specific characteristics of the Amvrakikos Gulf and its lagoons (higher temperature, lower salinity, waters richer in nutrients) attract fish populations from the nearby Ionian Sea. In spring, euryhaline fish species such as sea bream, mullet, sea bass, saddle bream and sole migrate to areas with low salinity and abundant food and enter the lagoons through the natural outlets or channels that connect them to the gulf waters.

In the wider areas of these natural outlets, the so-called *divaria*, fishermen (*divarades*) have built traditional barriers and fish trap installations (*kalamotes*). These traditional fish traps capture fish during their migration out of the lagoon, when they are returning to the more stable conditions provided by the gulf and the open sea. Nowadays the traps are constructed of concrete with metal grilles; but it is still possible to find traditional traps made of wood and reeds. In the lagoons, various kinds of fyke nets* (volkous, daouli) are used primarily to trap eels, but also shrimp and other species such as giant gobies (*govios*), while various nets (*trata, gripos, traina*), lines, traps (*kalamotes, kamarologos* for squids), dip nets (*apohes*), fish lamps and spears are used to capture mullet, sea-bream, sea-bass and saddle bream.

The traditional refined *Avgotaraho* or ‘Amvrakikos caviar’, which has been known since ancient times and is similar to the Japanese *karasumi* and the Italian *bottarga*, is produced from the mature ovaries of the flathead grey mullet. Other local delicacies (*mezedes*) include grilled *petalia* – traditional mullet fillets salted with natural sea salt and sun-dried.

Today, about 1200 professional fishermen fish in the Amvrakikos Gulf and lagoons, and the associated chain of production, distribution, trade, consumption and investment is vital in sustaining the economy of its coastal communities (Zalahori et al., 2001; Haralambous, 2007b).

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7 Fyke nets are large hoop nets that act as funnels to trap swimming fish and, especially, eels.
Current threats to the Amvrakikos Lagoons and their fisheries

The lagoon fisheries of Amvrakikos are nationally important and historically renowned. The 18 lagoons that surround the Amvrakikos Gulf serve as nurseries for large populations of fish that feed and grow in the lagoons during the early stages of their development. Ranging in size from 10 to 2900 ha with a mean depth of 1 metre and a maximum of 3 metres (except for the wintering channels, some of which are deeper [ACEA, 2001]), the lagoons cover an area of approximately 65 sq km. The majority of the lagoons are exploited for fish production on a commercial basis, with fisheries traditionally concentrating on mullet, sea bream and eels.

The lagoon system of Rodia-Tsoukalio, one of the most important biotopes in the area, was formerly one of the most productive lagoon fisheries in the whole of Greece (Papayannis et al., 1986). Among the largest lagoons of its type in the Mediterranean (Zalidis et al., 2006), this mosaic of more than 50 sq km of lagoons, marshes and reed-beds is of crucial ecological importance for the fish and bird fauna that habitat it, as well as for its direct functional links and connections with the Louros River, terrestrial areas and the gulf.

The pollution of water and the alteration of the lagoons’ ecological structure and functioning has led, since the 1980s, to a severe decline of the productivity of the Amvrakikos lagoons, from 10% to more than 50% depending on the site, particularly with regard to characteristic species such as eels8 and mullets9. A reduction in fish prices has also increased pressure on the fishermen’s income (ACEA, 2001; Oikos, 2003; Kentrou, 2005; Koutsikopoulos, 2008).

As productivity decreased, the exploitation of the lagoon fisheries intensified without improving their productivity, and the number of professional fishermen in the area’s two most important lagoons fell from 350 in the mid-1980s to 120 today (ibid.). While the artificial stocking of the lagoons with fry (mainly sea bream) practised since the mid-1990s in most of the lagoons in the Amvrakikos complex has not succeeded in reversing the decline in productivity, it has induced fish population changes and led the fishermen to close the channels more and more hermetically. In the case of the largest lagoons, in particular, this has caused severe problems due to the lack of water circulation and the associated ecological functions (ibid.).

The situation is especially critical in the case of Rodia-Tsoukalio, where the lack of water circulation is ‘exceptionally and excessively intense’ (ACEA, 2001). Documented trends include: a reduction of over 50% in fish productivity and in the number of fishermen10; a reduction of over 50% in the extent of distribution of

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8 A major mass mortality event affected the eel population in 1988, since which eel productivity has never reached its former levels. This reduction in the eel population occurred simultaneously in different regions (Kentrou, 2005).
9 Koutsikopoulos (2008) mentions a drastic decline in Gobius cobitis (govios).
10 Data for the Rodia-Tsoukalio lagoon indicate that in the period 1976-1984, 180 fishermen caught 160 to 200 tonnes of fish per year (i.e. 58 to 69 kg/ha/year), while today 47 fishermen catch on average 55 tonnes per year, about one third of which are eels. Data for the nearby lagoon of Logarou indicate a much less severe deterioration: today 96 fishermen take an average of 85 tonnes/year, while in the 1980s 149 fishermen took an average of 189.5 tonnes (75.7 kg/ha/year) (Papayannis et al., 1986; ACEA, 2001; Spyrtos, 2008; administrative data).
submerged macrophytes; increased salinity in the marshes and lagoons\textsuperscript{11}; adverse effects on protected bird species\textsuperscript{12}; the transformation of the characteristic vegetation from a mosaic structure of wet grassland and marsh into a relatively species-poor structure dominated by \textit{Phragmites} reeds; aggravated seasonal eutrophication and the desiccation of all peripheral shallow areas; and the aggravated seasonal hypoxia of the small lagoons surrounding Rodia, whose productivity has reached dramatically low levels (ACEA, 2001; Oikos, 2003; Spyrtos, 2008).

The freshwater supply to Rodia-Tsoukalio has now fallen to minimal levels, relying on rainfall because of the Louros River embankment (1950s–1970s) – which causes increased salinity and the lack of flood events and freshwater inflows into Rodia marsh – and the intensive exploitation of groundwater that drained the spring water sources at the bottom of the lagoons (Hellenic Ministry of Environment, Physical Planning and Public Works, 1998; Oikos, 2003)\textsuperscript{13}. Sluice gates have been built through the Louros dikes to allow the controlled entry of fresh water into the Rodia marshes on two occasions since 1990 (in 1993 and 2000),\textsuperscript{14} but both of these constructions have been destroyed and almost no freshwater now enters the Rodia marshes from the Louros River (Spyrtos, 2008).

Hydro-ecological exchanges between the lagoons and the open gulf have also become extremely restricted by restructuring works that reinforced the spits of land separating Tsoukalio Lagoon from the gulf in the 1980s, as well as by the current water circulation management, which causes the lagoons to operate significantly more like a closed system. ‘By trying to retain juvenile fish inside the lagoons and not lose them through the channel nets, fishermen close the connecting channels with 4 mm-thick metal sheets, which are kept in place until August when the mullet season begins; these sheets block the circulation of water and lead to serious problems in the lagoon’ (ACEA, 2001).

\textsuperscript{11} In Tsoukalio, salinity can now reach 30‰, an increase of 5‰ since 1988 (Zalohori et al., 2001).

\textsuperscript{12} The Amvrakikos LIFE–Nature report (Oikos, 2003) notes that inappropriate water management and the successive degradation of habitat has impacted negatively on many Annex I bird species, including \textit{Aythya nyroca}, \textit{Botaurus stellaris} and \textit{Phalacrocorax pygmeus}. More specifically, according to the 1999 LIFE Nature report (ibid.) on the Rodia-Tsoukalio lagoons, the numbers of wintering ducks have shown a declining trend, even though the site still supports internationally important numbers. Concerning the large Rodia marsh, the LIFE report shows that increased salinity and the lack of flood events and freshwater inflows into Rodia marsh has induced the degradation of vegetation cover and habitat structure. This degradation has contributed to the decline of Greece’s largest known breeding population of \textit{Aythya nyroca}. The inappropriate water management of the marsh and the successive degradation of habitat has also impacted negatively on the wintering \textit{Botaurus stellaris} on the site, which is the only Greek site where the species might breed. Habitat degradation and the disruption of the marsh’s hydrological regime also affects the conservation value of the site as wintering habitat for the \textit{Phalacrocorax pygmeus}. Changes have also been noted in the structure of halophytic plant communities, the reed-beds and the water grasslands at the edges of the lagoons, which in turn impact negatively on many Annex I bird species.

\textsuperscript{13} According to the competent prefectural services, more than 13 000 abstraction wells are currently active in the surrounding agricultural plains, fewer than 4000 of which are authorised. There are local problems of aquifer salinisation (Oikos, 2003), and the spring water sources at the bottom of the lagoons have been drained (Hellenic Ministry of Environment, Physical Planning and Public Works, 1998).

\textsuperscript{14} In response to pollution problems affecting the Louros River, an adaptive management programme was implemented in the framework of the EU LIFE-Nature project at Amvrakikos in 1999-2003 to allow controlled flows of water from the Louros River into the Rodia marshes based on the seasonal needs of the wetlands and taking into account the water purification capacity of the reed-beds.
Fig. 3.21 Topographical map of Rodia marshes and lagoons and view of Tsoukalio lagoon, the channel closed with metallic sheets. The water level in Tsoukalio is 10 cm lower than in the gulf.

The basically preserved physical structure of interconnected lagoons and marshes covering vast areas delays and attenuates the degradation of the wetlands, and helps to maintain their restoration potential at a high level. There is a need to recognise the common interests of fisheries and wetland conservation for the sustainability of the socio-ecological system; this alone can ensure an adequate ecological quality and functioning of the lagoon system by moving towards a more ecosystem-based management of the fisheries, that in particular ensures adequate hydro-ecological exchanges between the adjacent and interdependent wetlands, in addition to the necessary regulation of pollution and water abstraction.
Current threats to the Amvrakikos Gulf and its fisheries

The Amvrakikos Gulf marine ecosystem is a rich and productive system that sustains nationally important fisheries. Coastal fishing is a traditional activity that continues to be widely practised today. According to ETANAM (2007), 716 craft totalling 10 757 horsepower are involved in professional fishing in the Gulf, in addition to the activities of numerous amateur fishermen. The Amvrakikos coastal fishing fleet has declined by around 30% over the past 15 years, in parallel with fleets elsewhere in Greece (Koutsikopoulos, 2008).

The specific fisheries management regime in the Amvrakikos Gulf, the small horsepower of the boats, and the continued use of traditional fishing gear and techniques appears to have allowed the ecological quality of the gulf to be maintained, including its rich food chains, and hence the fishing activities that depend on them directly. In particular, the large stocks of sardines and anchovies constitute an important food source for dolphins, whose relatively high density and site fidelity in the Amvrakikos Gulf is interpreted as relating primarily to the availability of prey, especially epipelagic schooling fish (Bearzi et al., 2007). These species’ intermediate place in the trophic chain between plankton and large marine predators is important for the gulf’s ecological structure and functions as a whole.

The Amvrakikos Gulf is one of the most eutrophic coastal areas in the Mediterranean, and its oceanographic configuration as a dilution basin leads to strong water stratification and a slow process of deep-water turnover. In the gulf’s deepest waters, oxygen concentrations are naturally depleted to the extent of anoxia, and fish populations and meso- and macro-zoobenthic fauna appear to be extremely limited in quantity and diversity (EKTHE, 1989; Koutsikopoulos, 2008).

The most important threat to the ecosystem of the Amvrakikos Gulf and its fisheries—that an excessive inflow of nutrients and organic matter combined with further restriction of the gulf’s deep water turnover will enhance the gulf waters’ eutrophication and aggravate the hypoxia that naturally occurs in its deeper water—has been described in detail in the works of Papayannis et al. (1986) and EKTHE (1989).

Because of increasing pressure, the current situation has become critical and may result in the severe degradation of the marine ecosystem in the short or medium term (EKTHE, 1989; Haralambous, 2007a; Koutsikopoulos, 2008).

Despite some important regulatory measures put in place by the administration, the immediate catchment basin of the Amvrakikos Gulf is among the most polluted in Greece in terms of organic matter and nutrients in the water (Ministry of Development, 2007). The waters are continuously and excessively enriched by eutrophying substances, especially from large areas of intensively irrigated agri-

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15 Fishing by trawling sea-bottom habitats does not occur in the Gulf, and fishing with purse seine nets has been prohibited since the 1980s because of declining catches (Papayannis et al., 1986).
culture in the plains of Arta and Preveza\(^{16}\), a high concentration and growing number of intensive pig-breeding units\(^{17}\) and other agro-industries, domestic waste and wastewater, and an increasing number of intensive aquaculture units.

The alteration of the Gulf’s hydrodynamics has severely reduced the gulf deep water turnover rate. The main alteration factor is probably the blocking by the Pournari dams of the regular floods of the Arachthos river, which formerly played an important role in the hydrological functioning of the Amvrakikos Gulf marine ecosystem, especially in its eastern, deepest and most enclosed part (Koutsikopoulos, 2008; Panagopoulos, et al., 2008; Spyратos, 2008). Also, increasing water abstraction, notably for irrigation, has reduced the amount of low salinity and well-oxygenated surface waters on which the gulf food-web is strictly dependent. Road and harbour works have also restricted water circulation between the Gulf and the Ionian Sea (Papayannis et al., 1986; Zalohori et al., 2001; Koutsikopoulos, 2008).

Almost all the lentic shallow and enclosed areas of the rivers, drainage canals, lagoons and the gulf display increasing nutrient concentrations and eutrophic

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\(^{16}\) The large areas of intensively irrigated cultivation, which include large areas of cereals and citrus trees, result in high nutrient loads in the watercourses that drain these areas (Vavizos et al., 1997). The irrigated surface area increased from 36 sq km in 1986 (Papayannis et al., 1986) to 445 sq km in 1997 (Vavizos et al., 1997).

\(^{17}\) According to 2008 administrative data (Spyratos, 2008), more than 60 intensive piggeries housing some 10 000 nursing sows are still located in highly sensitive areas such as the communities of Louros, Philippiada, Amvrakikos and Philothei whose waters drain into the Gulf. The total number of productive pigs in the prefectures of Preveza and Arta increased from 23 454 in 1980 to 97 734 in 1999.
character (EKTHE, 1989; Vavizos et al., 1997; Zalahori et al., 2001; Spyratos, 2008; Koutskikopoulos, 2008).

A recent study of the Amvrakikos oceanography linked with the coastal fisheries (Koutskikopoulos, 2008) has shown a general aggravation of the Gulf's situation: deep hypoxia has become more intensified and the extent of the well-oxygenated marine biotope has shrunk since the EKTHE study (1989); on average, water bodies become almost anoxic below 20 metres in depth; and the concentration of fishing efforts in specific favourable areas in the Gulf has increased, notably in the shallow areas in the north of the gulf, close to the connection with the Ionian Sea.

Two recent events were more severe than anything documented before, and are thus clear signs that the situation is being aggravated: (i) A massive fish mortality involving around 1000 tons of fish in aquaculture units in the Menidi area in February 2008 showed that several years of highly limited deep-water turnover had worsened the deep oxygenation conditions; the mortality occurred when specific climatic conditions led to a particularly significant vertical mixing event. Similar events occurred, but on a smaller scale, in 1992 and 1998. (ii) In the spring and autumn of 2009, a significant proliferation of phytoplankton occurred across the entire gulf, weighing down fishing nets with its mass. The extent and intensity of this phenomenon was unprecedented in the gulf (P. Haralambous, D. Barelos, personal communication).

There is no evidence of a significant decline in the productivity of the open gulf fisheries in respect of species such as sardine, mullet, striped mullet, cuttlefish or shrimp (Kentrou, 2005). Other species formerly abundant in the gulf waters, such as the barbel, specific species of sea bream (*sparoi*) and sardine (*papalina*), squid and other species (*mournouria*, *menida*) seem to have almost disappeared from the fishing nets (Kentrou, 2005; P. Haralambous, personal communication).

The dramatic expansion of oxygen-starved marine ‘dead zones’ observed worldwide and mainly attributed to coastal water eutrophication from anthropogenic causes such as low river flows and the excess runoff of nutrients from large farms (UNEP, 2006; Diaz and Rosenberg, 2008), should be considered a strong warning for the Amvrakikos Gulf. The configuration of the Amvrakikos Gulf would indeed favour the development of such a ‘dead zone’, according to criteria developed by the UN Environment Programme (namely strong water stratification, low levels of deep-water turnover and eutrophic conditions).

**Conclusions and opportunities for synergy**

The Amvrakikos wetlands and their fisheries have major natural and cultural values that are typical of Mediterranean wetlands.

These values are strongly interrelated. The fisheries directly and intrinsically depend on the ecosystem’s quality, functionality and productivity. Also, as can still be observed in the open gulf, and could be observed in the lagoons until recently, maintaining the use of traditional fishing gear and techniques enhances the
natural and cultural values of the Amvrakikos wetlands, sustains the rich food chains and provides revenue for hundreds of fishermen’s families.

Ensuring the environmental sustainability of these wetlands is of major social, cultural, ecological and economic importance. An immense part of the natural and cultural values of the region depend on the wetlands, as does the locally embedded sustainable employment, which is of great socio-economic and cultural value, and the general attractiveness of the region.

The creation of the Amvrakikos National Park in 2008 provides an important opportunity to define and implement adequate regulatory measures to protect and enhance this invaluable heritage. The National Park’s management plans, which are still to be defined, will need to assess and seriously take into account the ecosystem’s water requirements in particular. Adherence to the principles of ecosystem-based, adaptive and participative management is likely to lead to positive results.

In line with the Ramsar Convention guidance on ‘Culture and Wetlands’ (objective 1.1), economic and regulatory measures should be taken to stimulate traditional fisheries and ensure their sustainability.

Appropriate environmental flows should be defined downstream of the Pournari dams including, at a minimum, high mean winter flows and flooding events to ensure regular deep water renewal in the Amvrakikos Gulf, in addition to proper implementation of the existing legally-prescribed minimum allowable flow (7 cu m/s for the Arachthos river). A public debate could be initiated on the issue of defining and implementing environmental flow allocations for the protection of Amvrakikos.

Concerning the Rodia-Tsoukalio lagoons and marshes, in line with the Ramsar Guidance mentioned above (objective 4.3.1), cooperation between lagoon fishermen and the guardians of sacred sites should be encouraged. To reach a more integrated and shared view of the lagoon’s needs, and to achieve a progressive improvement in its management, all the relevant stakeholders should be involved in the elaboration of management plans for the lagoons, in particular (along with other appropriate institutional and environmental bodies), including the fishermen of the Aneza cooperative, the fishermen of the smaller and more enclosed lagoons surrounding Rodia (such as Aghios Georgios, Konstantio, Tsoukalou), and the guardians of the Panagia Rodias Monastery and its Rodia Wetland Centre. Particular attention should be given to the management of the channels on which the crucial and complex exchanges between the lagoons and the gulf depend.

Improving the control of water abstraction and pollution, and restoring functional ecological interactions between the adjacent and interdependent wetlands, may well be essential measures for the well-being of the ecological, socio-economic and cultural values of the Amvrakikos wetlands, the gulf and the wider area.

Valuable information, inspiration and practical solutions can be found in the traditional management practices of the area. For example, by the end of July,
small-mesh nets (8 mm) were traditionally replaced by larger-mesh nets (12 mm) to allow sufficient water flows and currents to enter from the gulf and vivify the lagoon in summer (interview with K. Manikas18, July 2008). Similarly, the use of traditional local and natural materials (wood, reeds) for fishery structures in the channels could help avoid the deterrent effect on some species (such as mullet) of the concrete and metal materials currently used (ACEA, 2001).

A very favourable factor for environmental management in Amvrakikos is the existence of locally embedded organisations – notably ETANAM (the local development agency), and the Amvrakikos Management Body (dedicated to the management of the protected area)— equipped to initiate scientific environmental studies, engage in close and longlasting cooperation with local stakeholders and provide technical assistance.

Civil society seems to have been increasingly mobilising and organising itself to protect the Amvrakikos complex in recent years, with several environmental associations created in the area since 2005. This might bring about interesting changes for the future, as a result of increased public awareness and of greater social pressure being put on the competent authorities to protect the Amvrakikos gulf. Moreover, the fishermen of Amvrakikos are actively demanding the protection of the Gulf, as numerous demonstrations and open letters to the competent authorities have demonstrated (Spyratos, 2008). In particular, it is of vast symbolic and practical significance that the President of the Confederation of the Epiros Region Fishermen’s Unions, Pavlos Haralambous, was also President of the ‘Active Citizens of the Amvrakikos’ association19, one of the most active environmental associations in the area20, which seeks ‘to rescue the Amvrakikos Gulf from pollution, and to promote its progressive ecological restoration and revitalisation’.

References
ACEA (2001), Lagoon Fisheries Organisation and Management in 18 Prefectures of Greece, Aquaculture Center of Acheloos, Athens: Ministry of Agriculture (in Greek).

‘Active Citizens of the Amvrakikos’,
http://amvrakikos-sos.blogspot.com/ (in Greek), checked 8 April 2011.


18 K. Manikas is the former President of the Aneza Co-operative of Rodia-Tsoukalio lagoon fishermen.
19 From its establishment in 2007 until 2010.


Koutsikopoulos, K. (2008), Key hydrological features of Amvrakikos current hydrological situation, in Fishing Activity in Amvrakikos Gulf: Current Situation and Perspectives, University of Patras and Epiros, Fishermen’s Unions Confederation (in Greek).


**Related literature**


3.3 Hunting

Hunting is one of the earliest activities of the human species, and humankind’s survival depended on it for a long time. In the twenty-first century, hunting is still practised, legally or illegally, for subsistence in a number of Mediterranean countries, and not only in the South and East of the Basin. For example, only a few years ago, the commercial slaughter of birds in winter was practised by international hunters in the Evros Delta (Greece).

In the more affluent countries of the Mediterranean, hunting has morphed into a major sports activity. Backed by a strong lobby, it has a considerable economic impact and important industrial and commercial implications. The environmental impact of hunting is also important, not only in the form of pressure on species populations, but also in artificial changes made to wetlands to maximise their hunting potential. As a result, battle lines have been drawn between ecologists clamouring for the abolition of hunting and hunters who maintain that they protect nature and that their activity has strong cultural roots.

Ramsar Guidance

As this debate will not be concluded in the near future, there is a need for guidelines which will serve to minimise the negative impacts of hunting on wetlands and maximise some positive impacts. To ensure the sustainability and ecological compatibility of such hunting activities, both subsistence and sports hunting can in principle be allowed within strict limits that will safeguard ecosystems and species populations. Such limits would include zoning sites and limiting the hunting season, specifying huntable species, the size of catches and permissible hunting methods. Landscape modifications to increase hunting potential should usually be severely restricted (except where they are part of broader wetland restoration objectives) and the replacement of lead shot with non-lead alternatives should be made mandatory. Strengthening the cultural aspects of this activity will also contribute to its sustainable practice (see Annex II, p. 411).

A broad Mediterranean view of hunting

Although hunting has been practised without serious concerns for thousands of years in the Mediterranean Basin, it is now facing new challenges. The dramatic increase in the human population and the subsequent strains on natural resources call for this historic activity, which has sustained humans for thousands of years and has been considered an art in certain social environments, to be assigned a new place. Jean-Yves Mondain-Monval from the French Game & Wildlife Agency (Ministry of Ecology) explains that the survival of hunting depends on the adoption of sustainable modern techniques, which must be integrated into each country’s culture.
Hunting in Mediterranean wetlands and its cultural aspects

Jean-Yves Mondain-Monval

Abstract

Hunting has been practised in Mediterranean wetlands since the Palaeolithic era. All through this period, hunting has stimulated humankind to design and improve techniques, weapons and associated devices, and has influenced artists. The richness of this culture has developed in a context in which the legitimacy of hunting has rarely been called into question. Hunting was for a long time placed under the auspices of divinities, and was considered an art in itself. Today, the dramatic worldwide increase in human population and the environmental changes this entails has led to the emergence of new concepts such as sustainability, biodiversity conservation and wildlife management. The environmental changes are particularly pronounced in the Mediterranean region, where water is scarce and wetlands are under growing pressure from development. Hunting in Mediterranean wetlands, which was previously practised without serious problems or concerns as to its sustainability, now faces new challenges. This historic activity must find its place in the public consciousness, and amidst efforts aimed at securing the sustainable use of natural resources and biodiversity conservation. If hunting is to survive, then modern techniques based on biological sciences must be integrated into hunting culture.

Keywords: Hunting, culture, environmental crisis, wildlife management, migratory birds

Introduction

As is generally known, wetlands are highly productive ecosystems which provide a great variety of goods, services and functions. In arid/semi-arid climates such as the Mediterranean, where water is scarce, wetlands provide many living organisms with refuge amidst an immensity of unfavourable dry habitats. They therefore tend to concentrate wildlife within and around them. Migratory water-birds can stop over during their annual migrations, mammals find shelter in their dense reed-beds, fish can breed and spawn there, and luxurious vegetation produces fodder for cattle and thatch for houses. It is not by chance that early Man naturally settled within these habitats. Man is not a simple predator; he is ‘conscious of his own consciousness’ and generates ‘culture’ through all his activi-
ties. Hunting is no exception to this, and throughout history, hunting culture has developed and is a relevant ingredient in building a future full of life and adapting to changing contexts.

From the hydrological point of view, which is so important when dealing with wetlands and life, a marked difference exists between the northern and southern parts of the Mediterranean Basin. Water resources are very unequally distributed between the two, which obviously leads to different uses, civilisations and cultures within wetlands. The socio-economic conditions are also very different in these two parts of the region, and in some places hunting may represent a vital additional source of income, particularly in south-eastern areas. It is impossible to describe so many different situations in just a few words; rather, this chapter will use examples to briefly review how hunting has been practised through history in Mediterranean wetlands, to examine the cultural aspects that have emerged and make some suggestions with regard to its future evolution.

**Prehistory**

Hunting has been practised in the Mediterranean wetlands since prehistoric times. In the upper Palaeolithic, the climate of the Mediterranean Region, although continuously changing over that long period of time, was very different from what we know today. Archaeological evidence of the hunting of waterbirds date back as far as 50 000 years BP with the remains of great auks (*Pinguinus impennis*) found in a few caves around the Mediterranean, sometimes associated with impressive paintings (Courtin and Clottes 1994; Gourdin, 2008).

Although large animals such as deer, wild bulls and boars have been hunted for food in Mediterranean wetlands, waterbirds certainly also represented an important proportion of the animals caught in this habitat. The occurrence of birds in the diet of the first human beings has, in fact, most probably been underestimated. The fragile remains of small animals and birds are often disregarded by palaeontologists and archaeologists, who concentrate their efforts on the better-preserved bones of big game (Mourer-Chauviré, 1979).

The first humans also took advantage of the fact that some bird species (e.g. geese) are flightless for a short period of time each year when they are moulting. Techniques involving ropes, hooks, glue and even nets were also probably used to catch birds; most of these techniques are still in use in some parts of the world (Mourer-Chauviré op. cit.; Pathou-Mathis, 2009).
Hunting in historic times

The most ancient and beautiful records of hunting in the Mediterranean wetlands are undoubtedly contained in ancient Egyptian paintings and papyruses. They clearly indicate the importance of wildfowling for a wide social range of Egyptians over a long period of time. Surprising hieratic texts written some 5000 years ago reach across the millennia to describe ‘The pleasures of fishing and fowling’ (Stead, 1986). In the ‘Fowler’s Speech’, which also dates from the Middle Kingdom, a hunter is already complaining about the drainage of some marshes for agriculture and the resulting loss of wildlife! Sekhet, the goddess of the fields and marshes, protected hunters and fishermen and rewarded their endeavours (Dollinger, 2000).

Fig. 3.23 Wild boar and deer hunting scene dating back to Roman times (IVth century) on a sarcophagus found in the Camargue, very close to Arles.

Although important for trade and providing the common people with food, it was at this time that hunting was first practised to protect crops or cattle, but also purely for pleasure. Regarding hunting techniques, the pictures of Egyptians using nets and live decoys, throwing-sticks, boomerangs or bows and arrows to catch or kill ducks and geese are self-explanatory and supplemented by the discovery of the weapons themselves. The ancient Egyptians are known to have selected the first dog breeds for hunting, though wildfowlers also used domesticated cats as helpers at this time. Hippopotami were hunted in order to protect crops, and crocodiles were probably hunted in some places for safety reasons. Pharaonic hunting parties are well-documented; resembling military operations, they concentrated in the main on dangerous or ‘noble’ animals such as wild bulls, ostriches and lions. (Anonymous, 1960; Stead op. cit.; Dollinger op. cit.).

The importance of hunting is obvious, too, in Graeco-Roman mythology. For example, several of Hercules’ trials (including the Nemean Lion, Ceryneian Hind, Erymanthian Boar) are fantastic hunting tales. The wild boar occupies a special place, as it does in other known mythologies (Syrian, Gallic, etc.). This animal
does indeed thrive in wetlands, where it can feed on plant tubers and find shelter in remote reed-beds. It is worth noting that Ovid’s detailed description of the hunting and killing of the mythical Caledonian Giant Wild Boar\(^{22}\) starts in a wetland where the monster had hidden. Ancient civilisations certainly considered the hunting of the wild boar the most noble form of hunting, in which the hunters could demonstrate their courage and strength. The hunting of birds, which requires other qualities such as patience, skill or cunning, was sometimes poorly considered (as for example by Plato in ‘The Laws’).

The first known book specifically about hunting, ‘The Art of Hunting’, was written by Xenophon in the fourth century BC. It refers to the divine origin of hunting (‘Hunting and hounds are the invention of gods, of Apollo and Artemis’), and underlines the value of wild boar hunting with hounds. The importance of nets, into which (mammalian) game was driven by hounds, is also stressed. From all these writings, it appears that many of the weapons and hunting techniques used in this part of the world remained essentially unchanged until the invention of firearms (Jallet-Huant, 2008).

The religions of the Book (Judaism, Christianity and Islam) were certainly not opposed to hunting, though they did impose some restrictions on the methods of killing and the species which could be consumed.

**Biological knowledge and hunting regulation in the past**

Biological knowledge about game species, and especially migratory waterbirds, remained quite limited until the twelfth century. Aristotle (350 BC), and many scientists since, thought the swallows that disappeared in winter were hiding in the mud under water. There was little knowledge of nature in evidence; only Aristotle and Pliny the Elder are known to have written about natural history. It should also be remembered that the ‘spontaneous generation theory’ (of the origin of variety) held sway for two millennia, and was only properly abandoned in the nineteenth century. The very first studies on migration were only conducted in the late seventeenth century, when a primitive bird ringing technique was used.

In these circumstances it is not surprising that waterbird hunting has been carried on for centuries in the Mediterranean region and throughout Europe without restrictions. In contrast, careful regulations have sometimes been enforced to regulate the hunting of some common sedentary game. The hunting of wild rabbits, for example, an important source of food in the Middle Ages, was regulated in the Camargue (Rhône River Delta, France) from the twelfth century on (Viala, 2006).

\(^{22}\) The *Iliad* relates how King Oeneus of Calydon (Meleager’s father) had forgotten to sacrifice to Artemis, who sent a Wild Boar to terrify the country.
Hunting techniques and devices

Down the centuries, Mediterranean hunters have invented weapons or devices for catching and killing different types of game species, and developed sophisticated techniques based on a sound knowledge of game behaviours.

Nets and weapons with a blade have remained the main tools for capturing mammals like wild boar, hare or deer. The design of traps and nets, either passive or active (‘active’ traps are those activated directly by people) or the taming of auxiliaries such as falcons, dogs, horses, ferrets and even cheetahs, are examples of the range from the simplest to the most sophisticated forms of hunting. These different methods often reflect the social origins of the hunters. Falconry has been practised to catch waterbirds and cranes in Mediterranean wetlands for centuries.

To kill animals at a distance, Mediterranean people used throwing-sticks, boomerangs, bows and arrows, cross-bows, slings and blow-pipes. The invention and improved design of firearms gradually replaced these other weapons from the sixteenth century onward. Imaginative techniques, including the setting of decoys and the use of whistles that imitate the quarry’s species, were also developed to attract game which could then be killed at a shorter distance.

Wetland management and conservation

In recent centuries, hunting and fishing were important sources of income for landowners or communities in many parts of the Mediterranean which exploit-
ed the areas concerned. Marsh owners or users developed a depth of experience in wetland management (e.g. the *Vallicoltura* in Italy) in order to produce game and fish.

In many countries where wetlands were in private ownership, the owners often opposed drainage schemes in order to maintain their traditional forms of exploitation. Today, thousands of hectares of marshes are managed by private owners at their own expense for hunting and fishing purposes. In the Camargue, for instance, two thirds of the remaining natural habitats are in private hands; most are used for cattle-breeding and hunting (Mondain-Monval et al., 2009). These marshes are, of course, also important for many other protected or rare species, and the potential contribution of private hunters to the conservation of wetlands and biodiversity must certainly not be underestimated.

**Hunting and art**

A very rich iconography related to hunting exists throughout the world, and perhaps especially in the Mediterranean region. Artists of antiquity, the Middle Ages and the Renaissance have all used hunting as a theme. In every part of the Mediterranean, hunting has influenced the decorative arts, furniture, ceramics, ornamental items, stucco and other art-forms (Pradie-Ottinger, 2002; Canova, 2006). Museums and private collections are full of famous sculptures and paintings which draw on hunting as their source of inspiration; Patier (2002) mentions that after religion, war and women, hunting is the most prevalent source of inspiration for painters. Iconographic references to hunting are also very abundant in the Islamic World. In both the northern and southern Mediterranean, hunting was often the favourite recreation of the nobles and aristocrats who patronised the arts.

A huge literature (poems and treatises) related to hunting also exists, and many superb ancient books were created in the Mediterranean region. Equalling in fame the first book on hunting by Xenophon, the treatise on falconry written by Al-Gitriff ibn Qudama al-Gassâni (eighth century) transmitted Arab, Persian and Turkish knowledge on this subject to the Latin West. It would later inspire one of the most famous books on falconry and ornithology, *De arte venandi cum avibus* (The Art of Falconry), written by Emperor Frederico II of Hohenstaufen at the beginning of the thirteenth century.

Often considered by hunters as an art in itself, hunting has also led to the creation of original arms or hunting devices that deserve to be considered works of art in their own right. Among the items designed to attract waterbirds within reach, hand-carved decoys were designed by the hunters themselves and sometimes achieved a notable celebrity. Imagination and a naïve artistic sense often took over from realism and led to the birth of superb examples of folk art. As most
hunters now use plastic decoys, these old wooden carved decoys are becoming rarer and are highly prized and expensive collectors’ items for sale in antique shops around the region.

The sharing and collective cooking of game has always been a very important part of Mediterranean hunting culture. Jallet-Huant (op. cit.) mentions several recipes created and written by famous Roman chefs for cooking wild boar and even flamingos.

**Dramatic changes in the twentieth century**

As far as nature, wetlands and hunting are concerned, the twentieth century brought with it dramatic changes. The most important factor has undoubtedly been the increase in human population within the Mediterranean Basin, which grew four-fold, from 100 million people in 1850 to 400 million in 2000, with an estimated population of nearly 600 million in 2050 (Brauch, 2003). The need for freshwater, arable land and urbanisation have grown in proportion. Enormous wetland land-claim schemes also took place over the same period in the northern Mediterranean.

Food shortages provoked by World War Two certainly put extra pressure on game species in many parts of the Mediterranean region. Moreover, the coincidence of the development of cheap, mass-produced firearms and the development of easier and cheaper means of transport, with more and more families possessing their own cars, also helped to make hunting with firearms more and more popular, while natural habitats continued to shrink.

**The ‘Environmentalist’ reaction**

Alarmed by these facts, many individual countries adopted new legislation in order to reverse or halt the negative trends already perceived in the field. Migratory waterbirds, however, constitute a shared international resource, and their conservation and sustainable use benefit from international treaties.

In North America, international treaties were signed earlier than in the Old World, between Canada and the USA as early as 1917, and between Mexico and the USA in 1936. These aimed at better protection for the migratory species shared by these three countries. Furthermore, a large amount of research and monitoring has been carried out in northern America, beginning in the mid twentieth century.

Each year, biologists gather a variety of types of data, such as the numbers of breeding birds and broods, the extent of available wetlands, the numbers of wintering birds, the number of birds shot by hunters and data from ringing and marking schemes. These data allow the implementation of an adaptive approach to
setting annual duck-hunting restrictions (length of the open season, bag limits per hunter per day, etc.). Subsequent monitoring can then measure the impact of these restrictions, combining to produce a process known as Adaptive Harvest Management (Blohm et al., 2006).

In the Old World, several international treaties have been signed which aim at protecting the environment and natural resources by co-ordinating and further developing the conservation efforts undertaken by individual countries. The Ramsar Convention (which came into force in 1973) and the Barcelona Convention and its protocols (1978) deal with the conservation of wetlands and the environment. European Community Directive 79/409 (1979), which is known as the ‘Wild Birds Directive’, and the African-Eurasian Migratory Waterbird Agreement (1999) are directly concerned with bird conservation.

The ‘Birds Directive’ for the conservation of wild birds and their habitats came into effect in 1979. The Directive also regulates hunting, takes precedence over national regulations, and imposes the same rules on all EU Member States. In 1979, at the European level, there was no complete international monitoring system such as the one then implemented in North America. The absence of precise data and an adequate monitoring scheme is addressed by means of precautionary principles based partly on the results of the scientific studies conducted in North America and Europe, and partly on good sense. In basic terms, the Birds Directive prohibits hunting during the return migration to the breeding grounds and during the breeding period itself. Furthermore, each Member State must protect the most important sites for wild birds in its national territory. Taken together, these protected sites constitute a European network which supports the maintenance of a favourable conservation status for the various species.

In the 1980s and 1990s, however, the ‘International Waterbird Census’23 and additional research (marking of birds, ringing etc.) showed that many waterbird populations were in fact migrating through or within a huge ‘flyway’ between Eurasia and Africa. The sole protection offered by the EC Birds Directive was therefore far from sufficient to ensure the adequate conservation of many bird species, and there was a need to extend the principles of the EC Birds Directive to the rest of the flyway. An agreement to this end was drawn up within the framework of the Bonn Convention on Migratory Species of Wild Animals (CMS) and named the ‘African-Eurasian Migratory Waterbird Agreement’, which is better known by its English acronym: ‘AEWA’. It entered into force in 1999, and at the time of writing has been ratified by 63 of the 118 relevant states (AEWA, 2010).

It is clear that the African-Eurasian flyway to which the Mediterranean Region belongs presents a far more complicated context than that of North America, with a large number of countries sharing their migratory bird populations, speak-

23 Which are co-ordinated bird counts carried out at the same time throughout a sample of wetlands in Eurasia and Africa.
ing many different languages and having very different cultures. Monitoring and research are therefore more difficult to co-ordinate than in North America. In addition to offering a framework for co-operation and international hunting regulation, the AEWA seeks to promote the development of a more accurate monitoring system for supporting waterbird management.

Hunting in Mediterranean wetlands today

Hunting is still a traditional activity practised in Mediterranean wetlands by hundreds of thousands of hunters who are mainly interested in three types of game: rabbit, wild boar and waterbirds. Precise data on the numbers of hunters is unavailable for many countries, and in many others the official statistics do not differentiate hunters according to the different types of shooting practised (sedentary game or terrestrial/aquatic migratory birds). There are also few data on the numbers of animals bagged by the hunters (BirdLife International, 2006).

The hunting of rabbits (Oryctolagus cuniculus) was a very popular activity throughout the Mediterranean’s wetlands when rabbit populations were over-abundant. In many places, however, a dramatic decline in rabbit numbers has recently occurred due to the spread of the Myxoma virus and, more recently, of Viral Haemorrhagic Disease. This decline has occurred in both nature reserves and hunted areas. Up to now, however, despite extensive and costly efforts, no satisfactory solution would seem to have come to light to help the rabbit populations recover.

Waterbird hunting is still very popular today in the Mediterranean, mainly in respect to ducks and geese. The number of waterbird hunters is probably in decline in northern parts of the area, but seem to be increasing in the south-eastern part. Although catching waterbirds with falcons and nets is still practised, mainly in the south-eastern part of the region, most hunters use guns. Waterbird hunting is often a contemplative activity, mainly taking place at dusk and dawn, and taking advantage of the natural movements of birds flying from their daily roosting sites to their nocturnal feeding grounds. The lead poisoning of birds due to the ingestion of spent lead shot is a problem that should hopefully be resolved. The use of non-toxic shot is now compulsory in a growing number of countries for hunting in wetlands, though many still have to move in this direction. Severe weather events can make waterbird populations very vulnerable to hunters, and there is a need to put adequate procedures in place for avoiding excessive harvests by imposing temporary bans on shooting during such periods.

The wild boar (Sus scrofa) is actively hunted with dogs, mainly but not exclusively on the northern side of the Mediterranean. For different reasons, this species has recently dramatically increased in numbers throughout most of the Mediterranean (but also in the rest of Europe, and as far east as China). Wild boar are causing increasing amounts of damage to agriculture and are increasingly in-
In most places, the species no longer has any natural predators, and hunters can therefore certainly play a useful role in regulating wild boar numbers, continuing in their ancient role as ‘crop protectors’.

Among the values and pleasures attributed to hunting in wetlands, hunters generally prize the feeling of being at one with nature, enjoying the wilderness and the wonderful scenery, and hopefully bringing home some delicious and unspoiled wild food to share with family and friends.

**Current knowledge on the status of harvested waterbird populations in the Mediterranean**

Millions of migratory waterbirds pass through the Mediterranean Basin and/or winter in the region every year. Waterbird hunting is intensively practised in nearly all Mediterranean countries, except southern Spain and the Maghreb countries (BirdLife International, op. cit.).

In Mediterranean wetlands, around eight species of ducks constitute the favourite quarry species. From data gathered through the International Waterbird Census, it appears that the fate of the relevant duck populations differ in the western and eastern Mediterranean:

In the western Mediterranean, the population of six duck species has shown a recent increase, one species seems stable and one appears to be in decline; in the eastern Mediterranean, the populations of six species are in decline and two species seem stable (Delany et al., 2008).
The reasons behind these differences are not obvious, especially since they may have their origin in countries or regions located to the north or south of the Mediterranean along the birds’ migration routes (i.e. northern Europe for the western Mediterranean, the Middle East and Central Asia for the eastern Mediterranean). In the absence of precise data, only hypotheses can be considered. The trends in duck populations may stem from differences in:

– climatic and hydrological conditions,
– the numbers of wetlands and refuges along the migration routes, and
– hunting pressure or management.

Clearly, our knowledge of the population dynamics of waterbirds in the AEWA range falls far short of the levels required to adequately ensure their conservation.

What future for hunting in Mediterranean wetlands?

Hunting is a very deep-rooted cultural activity in Mediterranean wetlands. At the beginning of the twentieth century, hunting was perceived by conservationists as the main threat to bird conservation. Today it is generally admitted that loss of habitats is by far the most important threat, while hunting has a negative impact only when levels are excessive (Hoffman in Silberstein, 2009). Indeed, hunting can play an interesting role in Mediterranean wetland conservation, providing that habitat management for game does not impact negatively on biodiversity. Hunting must find its place within the world’s general awareness of, and efforts to achieve, the sustainable use of natural resources – as, for example, in the way it is referenced in the United Nations Millennium Declaration adopted by the UN General Assembly in 200024. Like other human activities, hunting will only survive in Mediterranean wetlands and elsewhere if it is truly sustainable both biologically (abundant and stable game populations) and socially (accepted by the non-hunting majority). Hunters must also continue to develop their ethical positions in light of the fact that technical advances generally occur at a faster rate than animals can adapt to them.

In 1991, the Grado international symposium (Italy) ended with the adoption of the so-called ‘Grado Declaration on Mediterranean Wetlands’. This proposed a strategy to ‘Stop and reverse the loss and degradation of Mediterranean wetlands’. The Strategy’s ninth and final point recommends that ‘Governments of all Mediterranean countries adopt and in particular enforce national and international legislation for better management of hunting activity’ (Finlayson et al. 1992). At this time, the EC ‘Wild Birds Directive’ was, at an international level, the only text providing a clear methodology and a legislative framework specifically aiming at wild bird conservation.

Now, the AEWA provides a useful cooperative tool for moving towards sustainable hunting, and most Mediterranean countries have ratified it. This Agreement should be seen by hunters as a means of adapting and safeguarding their passion and their culture through the integration into it of new concepts including sustainability, biodiversity conservation and wildlife management based on scientific and objective approaches.

References


Anonymous (1960), Hunting and Fishing in Ancient Egypt, Cairo: Centre of Documentation and Studies on Ancient Egypt, Cultural publications.


3.4 Salt extraction

The extraction of salt from sea water has been a traditional activity in the Mediterranean since ancient times. This activity has transformed the landscape of coastal wetland sites and created a very special setting rich in cultural values as well as in biodiversity. It should be noted that the hypersaline ecosystems of salinas provide habitats for many wetland species of flora and fauna. An added positive factor is that these installations usually allow limited access, and thus species that nest or feed in them are reasonably well protected from human threats.

During the twentieth century, however, many of the traditional salinas were abandoned, mainly for financial reasons, since they could not compete with large, heavily industrialised facilities. Efforts have been made to maintain some of them, either by focusing on the production of high quality salt (such as the *Fleur du Sel* in the Camargue), or by combining artisanal production with education and ecotourism activities, through salt museums (as in the case of Sečovlje Salina in Slovenia).

A very interesting case study focuses on the Salins du Midi in the South of France, a large salina with a long history. For many decades, it has been the site of the largest nesting colony of flamingos in the world. The colony, which can consist of up to 20,000 pairs, is promoted and monitored by the Tour du Valat biological station. This large colony co-existed with the industrial production of salt. Unfortunately, the Salins du Midi has closed down, and though part of the property has been purchased by the Conservatoire du Littoral and will be protected and properly managed, the remainder is intended for real estate development, which is being strongly contested by local inhabitants and conservationists.

**Ramsar Guidance**

The Ramsar Guidance (Ramsar Guidance, p. 52) provides the following advice for the maintenance of traditional salinas and their cultural and natural values.

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**O.2.6.1 – To encourage the conservation of the cultural heritage of sustainable traditional salinas**

Within the constraints of free trade agreements and of economic feasibility, certain actions are proposed that may lead to the conservation of traditional salinas, as follows:

a) compile inventories, record and document traditional salinas, whether in use or abandoned;
b) evaluate the viability of operating individual traditional salinas;
c) encourage certification labelling of salt from traditional sustainable sources;
d) relate tourism/ecotourism programmes to traditional salt production;
e) support or initiate the establishment of salt museums or salt information centres;
f) assess the feasibility of restoring to use individual abandoned salinas; and
g) investigate other uses for abandoned salinas which would maintain their natural and cultural values.

Within the limitations set by trade agreements and commercial regulations, and taking into account financial considerations, the actions proposed by the Ramsar Guidance seem quite far-reaching.

**Mediterranean salinas and a case study from Slovenia**

Salt and its cultural heritage in the Mediterranean is addressed in a paper by professor Theodora Petanidou of the University of the Aegean, Greece, and Katia Hueso from the Asociación de Amigos de las Salinas de Interior, Spain. Harvesting and exploiting salt has shaped entire societies in the past. Today, salt and salinas play a significant role in sustaining local economies and in biodiversity conservation, as well as retaining powerful symbolic and spiritual connotations in vocabulary, idioms, technical terms and place names, and being of value in education and ecotourism activities.

A characteristic example of Mediterranean salinas is the case study of Sečovlje Salina Nature Park in Slovenia by its director, Andrej Sovinc. Traditional salt-making in this salina has boosted the local economy by providing opportunities for eco-tourism and the successful launch of organic products. The paper surveys the history of the region and examines how the private sector and conservationists can work together for the mutual benefit of the region’s cultural and natural heritage.
Cultural aspects of Mediterranean salinas

Katia Hueso and Theodora Petanidou

Abstract

Besides having been the ‘white gold’ on a global scale, salt and salt-making in the Mediterranean have been so important that one can refer to salt as a ‘cultural molecule’. Salt can be obtained in many ways that are related to its uses and applications; the culturally richest form of salt is the artisanal product. In the Mediterranean, salt has shaped history and given rise to towns, highways and trade routes. It has inspired philosophy and religion, challenged living and eating; sophisticated morals and customs; left behind strong symbolic and spiritual connotations in everyday language in the form of vocabulary, idioms, technical terms and place names. Due to their idiosyncratic salt-making techniques, salinas host a variety of forms of cultural heritage such as tools, engineering devices, buildings and other architectural structures. Today, the Mediterranean salinas are disappearing due to their low competitiveness in a global market, and the artisanal salinas are facing the biggest challenge of all. In addition to their low competitiveness in comparison with other forms of salt manufacturing, artisanal salinas suffer from threats such as changes in their biophysical features, unco-ordinated management and sheer ignorance of their values. There are, however, many reasons why efforts to conserve Mediterranean salinas should continue: they host a unique biodiversity with extraordinary survival mechanisms and population numbers, with their distinctive microscopic flora and fauna, their halophytes and their large bird communities. They are a source of inspiration for material and intellectual creativity, as well as for mere aesthetic contemplation. To conclude, Mediterranean salinas can today serve as poles for local development in the region: they provide perfect settings for educational and cultural activities, attract specialised tourism and offer high quality products for gastronomic, therapeutic, industrial, and biotechnological use. This range of uses is helping to generate new jobs for qualified staff, as well as a reinforced sense of belonging for the stakeholders involved, which in turn strengthens the values of the sites.

Keywords: Salinas, artisanal salt, cultural heritage, salinas values, biodiversity, local development, Mediterranean

Physical and cultural geography of Mediterranean salt and salinas

Common salt is the popular name for sodium chloride (NaCl), a rather abundant molecule in nature. Three quarters (77.8%) of its weight is sodium, the
rest chlorine. In nature, it occurs either as rock salt or as brine (salt dissolved in water). Unrefined salt of the sort obtained from artisanal salinas includes many other minerals that, in a sense, make it a ‘cultural molecule’ as well as the focus of this paper.

Salt is essential for life: without it, we would die. Salt is an important regulator of neurological transmission as well as muscular function. Besides humans, other mammals also need it for survival as they develop ‘salt hunger’ in its absence (Petanidou, 1997): herbivores obtain it from natural salty sources, and carnivores from raw prey meat.

Salt is the king of spices: it strengthens the natural taste of food and adds a stinging flavour to it. There are many types of salt nowadays, and salt connoisseurs discuss which type best suits different sorts of food, but there is wide agreement that unsalted food is virtually tasteless.

The particular physical and chemical properties of salt give rise to many different uses and applications which are often referred to as ‘the 14 000 uses of salt’25. The most common ones, which have been well-known since antiquity, include using salt as a preservative for food (from the ‘garum’ factories on the Mediterranean shore to the cured meats and cheeses further inland), in mummification processes, as an antiseptic, for softening leather and de-icing roads (Petanidou, 1997, 2005a). Nowadays, the industrial uses of salt or its components have hugely proliferated: from detergents to cosmetics, from superconductors to biotechnology, salt is virtually ubiquitous.

Not surprisingly, obtaining salt by any means (extraction, manufacturing) has been a priority for all peoples (Petanidou, 1997). The Mediterranean climate, with its hot and dry summers, has facilitated the natural evaporation of brine, whether at the coast or inland. The salt found inland or underground is mainly from the Triassic and Miocene periods (200 and 5-10 million years ago, respectively) (Petanidou, 1997; Carrasco and Hueso, 2008), when most of the land surrounding today’s Mediterranean was covered by sea. The evaporation of these seas created huge salt deposits that appear in the form of brine sources, hypersaline streams, lagoons and underground rock salt beds. Some inland salt is of more contemporary endorheic origin (Montes and Martino, 1987), but such sources are rare.

Thanks to the climate, the most common method of salt production in the Mediterranean region is solar evaporation. Coastal salinas consist of huge flat areas with pools of different sizes and depths into which seawater is pumped by mills, pumps or similar hydraulic devices, or is allowed to flow into deeper and larger pools by force of gravity or even the tides (the latter mainly in the salinas of the Atlantic coast). The seawater then flows by gravity or is led by mechanical de-

vices, animal- or even man-power to shallower, smaller pools. In this way, it gains progressively in salt concentration (due to the high evaporation rate) and NaCl purity (due to the differential solubility of other salts contained in the seawater). Finally, the brine enters the smallest pools, also known as crystallisation pools, where salt is formed and collected. These systems can be of industrial size (such as the Camargue in France or Torrevieja in Spain) or artisanal, requiring frequent and labour-intensive maintenance. This, for instance, is the case with salinas found in lagoons, which rest on soft alluvial soils and need an adequate working substrate to be created, such as the ‘petola’ clay carpet in the Sečovlje salinas (Slovenia). Others can be very simple in design, such as the primitive salinas of Mani in Greece, where the pools were carved out of the bare rock (Petanidou, 2005b; Fig. 3.26). In some cases however, salt is simply collected from the shore using simple or more sophisticated salt-making facilities. Other, less usual methods of salt production in the Mediterranean are rock salt mining, brine mining, vacuum extraction and ebullition or forced evaporation, the last of which has not been used for a long time (Petanidou, 1997).

![Primitive salinas carved out of rocks in Koukouri, Greece.](image)

These salinas, unique in their perception and functioning, are carved on a rocky promontory in Mani, S. Peloponnese. The little basins were then coated with successive layers of mortar containing slaked lime and sea sand.

In some inland parts of the Mediterranean (mainly Spain and Turkey), a special type of salina is found which uses natural underground and surface brine sources (e.g. saline lakes, rivers and streams) as its primary material. In the Iberian Penin-
sula alone, over 500 such inland salt-making sites have been reported (Carrasco and Hueso, 2008).

In all the above salt-making sites, specific tools were used for the collection of salt (e.g. spoons, scrapers, shovels or, in some cases, bare hands), as well as its transport and storage (e.g. baskets, bags, wagons and boats). All these devices, instruments, tools and tasks were given local names, leaving an immensely diverse salt lexicon in the region (Petanidou, 1997; Carrasco and Hueso, 2006).

In view of its many uses and applications, salt was a commodity of the utmost strategic importance. The ownership of –or right of use to– salt production facilities was an ambition of the powerful classes, and the source of many conflicts. Taxes were levied on salt in the same way as they are on oil today, making its market price far in excess of its real cost of production. This had enormous implications for the economic, commercial and political relations between the ruling powers at different times in history. For example, the uneven taxation of salt in the different regions of France in the seventeenth century created huge social and economic inequalities that eventually led to the French Revolution (Hocquet, 1985; Multhauf, 1985; Petanidou, 1997; de Person, 1999).

The cultural heritage of salinas

Apart from the ethical obligation to preserve our heritage for future generations (mainly involving non-use values), salinas are associated with a wide variety of other values that justify their conservation. As man-made landscapes, salinas offer a rich material heritage in the form of earthworks, buildings and tools. Yet they are also the cradle of a vast intangible heritage composed of traditions, beliefs, language and art (Petanidou, 1997; Cultural and Technological Foundation of ETBA, 2001; Viñals, 2002). Some of these aspects are discussed below.

Salt-making has shaped history in many ways at the local, but also at the global level. The production, storage and trade of salt in the Mediterranean has defined shipping routes and given rise to important ports, or, in the case of inland salt, created drovers’ roads –considered in some cases the precursors of today’s highways– and market towns in the middle of arid steppe areas, where salt was exchanged for agricultural and other farm produce. Historically this had implications for economies at every level. Many Mediterranean cities owe their rich heritage (buildings, art, wealth) to salt, with Venice being perhaps the best example (Hocquet, 1982).

Salt-making leaves unique and often fragile marks on the landscape. The substrate upon which the pools and other structures lie is usually built from materials found on site. The construction of trackways, channels and dykes is subtly complex, requiring technical knowledge and experience, and when left abandoned, these structures decay quickly. Salinas were designed in the light of the local topogra-
phy and locally available materials, and were built according to the salt-making know-how of the time, giving rise to an enormous diversity of salt-making sites in the region (Fig. 3.27). Indeed, no two salinas are alike (Réault-Mille, 2006).

![Aerial view of the salina of Imón in Guadalajara, Spain, taken from a hot air balloon.](image)

Although the salina is abandoned, the pools at the right side are still temporarily inundated as a result of substrate percolation. The three large storage buildings in the centre of the photograph are visibly damaged.

Important visible landmarks in these ‘saltscapes’ include the buildings used to store and process salt and to house the salters. Most of these buildings have been built according to local standards, and they are often very large and sturdy, which make them stand out in the usually flat landscape. Storage buildings are usually large and sometimes tall, necessitating buttresses to sustain their weight even when empty (Fig. 3.28). From the architectural point of view, these salt warehouses were the precursors of certain types of industrial buildings. Salters’ houses, on the other hand, many of which still stand in the vastness of the surrounding ‘saltscape’, were modest in many ways, being simply designed for temporary living and basically equipped for the summer using local materials. Other interesting constructions include the structures built to protect the waterwheels that pumped the brine to the surface in several inland salinas in central Spain (e.g. Imón, La Olmeda, Rienda, Medinaceli and Armallá). Other structures usually to be found near salinas –such as guard houses, fortresses, and surveillance towers– reflect the power struggles which arose from the salt trade. Yet a large number of monasteries, churches or even cathedrals are known to have been involved in the local salt business (Petanidou, 1997). In the cathedral of Sigüenza (Castilla-La Mancha, Spain), there is a plaque describing the use of salt as a payment for religious favours.
Salt hangars of this type reinforced with counterforts are rare in the Eastern Mediterranean, where salt piles were usually covered by tiles if at all. Neither the salt hangar nor the wagons once used to transport salt during the harvest have received any care since the abandonment of the saltworks in 1965.

Salt production techniques left a more humble visible heritage. By being so diverse, however, they have left behind a plethora of mills, pumps, harvesting and repair tools, hydraulic devices and other pre-industrial engineering solutions. Some of them are still in use in several types of industrial processes, with many of them dating from, or based on, those used in ancient times. Some of the technical solutions for salt-making are universal and can be found anywhere in the Mediterranean, others were adapted to local conditions. For example, in the Salado River valley in central Spain, over a dozen former salt-making sites occur in a single 20-kilometre stretch, but the trackway and pools pavement design in the crystallisation pools is unique to each, depending on the materials available and the local craftsmen concerned (Fig. 3.29). Also important from this point of view were intangible aspects such as the organisation of labour (related to the size and ownership of the salina and/or the period of history in which it was exploited), salt-making craftsmanship and the transmission of this knowledge to the salters. Other important aspects of heritage include the types and qualities of salt produced on the site, the trade networks arising from each site, as well as the artisanal and other uses to which local salt was put.
Fig. 3.29 Pavements of different salinas of the Salado Valley, Castilla-La Mancha, Spain.

The Salado valley is a 20 km stretch of saline ground hosting a dozen former salt-making sites. Despite being so close to each other, each salina is endowed with architectural and technical peculiarities. The photo shows the different paved bottoms of the crystallisation pools in six of these salinas. Although paved with the same material available throughout the valley, the differences in style and craftsmanship is apparent. They are: (a) Bujalcayado, (b) Rienda, (c) La Olmeda, (d) Paredes de Sigüenza, (e) Torre de Valdealmedras, (f) Imón.

Regardless of its origin, whether industrial or artisanal, salt has had a variety of uses. From the gastronomic point of view, many recipes—such as the classic fish baked in a crust of salt—use salt or brine as a basic ingredient. As a food preservative, salt allowed the storage of and trade in perishable foodstuffs such as meat, fish and vegetables which would otherwise be inedible within a few days of production, permitting a highly enriching gastronomic cultural exchange within and beyond the Mediterranean down the centuries (Gallart et al., 2005). In fact, many dishes require a specific type of salt (fine or coarse-grained, fleur de sel, inland or sea salt, etc.) for best results.

Perhaps the most interesting cultural aspects of salt-making are those that leave no visible traces at all. The symbolic values of salt are very deeply rooted in Mediterranean societies, and references to salt are frequent in the holy texts of major religions. Salt is present in most Mediterranean languages in straightforward vocabulary (such as salad, salary, salami, sauce) as well as in idioms (to take something with a pinch of salt, to eat someone’s salt, to share the salt and the beans) and in local place names, deriving from the Greek ‘álas’ (Hallein, Halle), the Roman ‘sale’ (Salinas, Salsomaggiore, Salzburg), the Turkish ‘tuz’ (Tuzla, Tuz Gölü) and the Arabic ‘al-melah’ (Armallá, La Malahá).
Saltscapes are also a powerful source of inspiration for material and intellectual creativity. From modest ceramic salt cellars to renowned paintings, artists and craftsmen have used references to salt in their work. Salt has inspired musical compositions and music-making: to be ‘salty’ is an essential condition for good Flamenco musicians. It has inspired writers and poets: the poems ‘Salinero’ by Rafael Alberti and ‘Oda a la Sal’ by Pablo Neruda are well-known. These landscapes are usually open, free and wild; remote and yet accessible; quiet but full of life: a place so basic, pristine and primitive in some ways that it cannot fail to excite an emotional response from the viewer. Its sheer contemplation is one of its most important values.

![Fig. 3.30 Cultural tourism at Salinas de Añana, Basque country, Spain.](image)

Within the context of the site’s master plan, the local authorities of Salinas de Añana have started a guided tour programme while restoration works are still in progress. Visitors enjoy the cultural values of the site and have the opportunity to see it changing.

However, we should not forget the natural values of saltscapes, too. Saline wetlands constitute special ecosystems with rare and fragile biota. The living conditions imposed by the presence of salt in the water and soil makes it a hard environment for flora and fauna, in which only halophytic (i.e. salt-tolerant) plants and animals survive. Many of the species capable of thriving in these environments are microscopic, such as hypersaline bacteria and algae, some of which form microbial mats whose diversity is still being discovered (Guerrero and de Wit, 1992; Hueso and Carrasco, 2009a, b). Halophytic biota and communities are very site-specific and include many endemics, especially in inland saltscapes which are isolated from each other. Saline wetlands are also important stopover
sites for migratory birds, as well as essential breeding and wintering grounds for both colonial (such as the greater flamingo *Phoenicopterus ruber*) and migratory birds (e.g. the avocet, *Recurvirostra avosetta*; and the black-winged-stilt *Himantopus himantopus*). The biological diversity of saline wetlands is also associated with their cultural products, as it is the basis for the provision of food and other materials for domestic use among the human inhabitants of the area, for themselves and their livestock. To illustrate this, a herder in the area of Imón, an important inland salina in central Spain, used to argue that his sheep tasted better because they fed on halophytes (K. Hueso, personal communication).

The aesthetic and natural values of saltscapes are key to their value as a tourist destination. Ornithologists in particular, but also botanists, geologists and members of the public with an interest in natural history have traditionally been fascinated by these flat areas. Saltscapes have also begun to attract a new type of visitor with an interest in cultural heritage (Fig. 3.30). This type of tourism is continuing to develop in salinas and offers, as will be discussed below, an alternative form of development.

**Pressures and threats**

The Mediterranean coast used to be dotted with salinas, from Cádiz in Spain to the Middle East. In addition, there was an immense richness of inland salinas, especially in Turkey and Spain. Unfortunately, salt is losing some of its value as a commodity (e.g. as a food preservative), and it can be obtained in larger and less labour-intensive ways elsewhere in the world. As a result, the immense salt-making heritage of the Mediterranean continues to disappear, and this is evident throughout the Basin (Petanidou and Dalaka, 2009).

Mediterranean salinas are facing both site-specific and general threats (Hueso and Carrasco, 2009b). The first include changes in the biophysical features of the wetlands and their natural infrastructure. Most threatening to the cultural values of salinas are land use changes in favour of intensive agri/aquacultural developments and urbanisation, the latter being perhaps the most damaging factor in the case of coastal salinas. Other important threats are the destruction, decay or loss of buildings, tools and hydraulic devices due to weathering, vandalism or theft (Casado and Montes, 1991; Williams, 2002; Hueso and Carrasco, 2009a, b).

Less visible are the general threats. This is related to the fact that wetlands are usually managed by several administrations at different levels (local, regional, national) and in different sectors (coastal zone management, defence, agriculture and others) or even by a mixture of public and private bodies. This makes integrated approaches to wetland management extremely challenging. Catchment management planning, on the other hand, usually gives priority to the availability of drinking water and pays little attention to saline wetlands (let alone saline aquifers). Overall, however, the key threat is the abandonment of salt-making
activities due to globalisation in the world market and sheer ignorance about the existence of salinas and their values.

The abandonment of traditional salt-making has had its strongest impact on the human dimensions of the activity, because most of the knowledge about traditional salt-making used to be transmitted orally. When the activity is abandoned, the traditions, legends and beliefs related to salt are slowly lost, along with the tools, devices and infrastructure that are left behind. Consisting, as they do, of very modest materials and fabrication techniques (timber and stones to cope with the corrosive salt) these objects present little interest to collectors or antique hunters who might otherwise play a role in their preservation. Perhaps most damaging of all is the sheer ignorance of the values of salinas, and this may be the fundamental reason why the pressures on salinas and the threats to their existence continue to grow and multiply. Only greater awareness can help policymakers, landowners, public administrators and the public to appreciate the cultural values of salinas and stimulate the will to protect and revive them.

Salinas’ cultural and other heritage as a basis for local development

The particular combination of the cultural and natural, tangible and intangible values of salinas make them a perfect educational setting in which one can teach (and learn) about history, geography, economy, architecture, religion, ethnology, botany, zoology, ecology and geology. These areas are a powerful open-air classroom for all ages, and should be looked after for future generations.

Salt is markedly present in our daily lives, but little is generally known about its origins and wider significance. The possibility of watching it being produced, or just seeing the landscape it derives from, can be hugely exciting. Even if one ignores the salt itself, saltscapes have much to offer, from architecture to ornithology and their aesthetic values (Petanidou et al., 2002; Petanidou and Vayanni, 2002; Vayanni, 2002). Thanks to recent trends like the rehabilitation of our cultural and industrial heritage, the fragmentation of vacation periods into shorter trips, the diversification and specialisation of tourism products and destinations and the proliferation of museums on craftsmanship, ‘salt tourism’ is starting to take shape. Salt museums are springing up everywhere: it is estimated that there are now over forty in the Mediterranean region alone (Neves et al. 2005; Sala Aniorte, 2007). Also, in line with the general trend, ‘salt events’ are appearing everywhere in the Basin, ranging from plain fresh produce markets in which salt is present to art festivals, conferences, guided tours around salinas, etc. or combinations of these. Examples of such events include the Heste de la Saü in Salies de Béarn, France, the Festa de la Sal i de la Anxova in L’Escala, Spain, and the Festival Sapore di Sale in Cervia, Italy. In some cases where salt-making is no longer viable, the traces of the activity can be used as a background for other cultural purposes, giving new life to
buildings or infrastructures. The master plan for the Salinas de Añana (Spain) converts part of the salt pans into an open-air theatre in which plays, concerts and other shows are provided for the public (Lasagabaster et al., 2003).

Preserving the cultural heritage of salinas is an expensive business. Different well-managed European-funded projects have contributed to this goal (e.g. ALAS\textsuperscript{26}, SAL\textsuperscript{27}, Ecosal Atlantis\textsuperscript{28}) with investments in the order of millions of euros, and with differing degrees of long-term success. The heritage of salt can probably not be effectively preserved in the long run solely with public funding. Private initiative has proven to be essential in some cases (for example at Sečovlje in Slovenia), but great care should be taken to approach heritage conservation on the basis of scientific—as well as monetary—criteria. Traditional guided tours and school visits are two well-trodden paths to the respectful exploitation of the Mediterranean’s salt heritage, although both are hardly profitable by themselves and are thus, as things now stand, unsustainable from a strictly economic point of view. Salinas may provide some products that are compatible with the protection of the associated heritage. Examples include the different salts that can be obtained by traditional methods and sold as gourmet products, and which can be very diverse in chemical and organoleptic properties. Indeed, artisanal manufacturing lends an added value to common salt. To this end, strategies such as the association of salt-making operations into lobby groups and certification under well-known gastronomic quality labels such as ‘label rouge’, ‘slow food’, etc. may help to acknowledge this added value (Viñals et al., 2005). Salt can also be mixed with other spices, herbs, colorants or scents to create other edible or bath salts. It can also be used as an ingredient in other foodstuffs—such as chocolate or sweets with fleur de sel— or in cosmetics such as exfoliating creams. The briny residue (‘eau mère’ or ‘mother lay’) resulting from the crystallisation of salt, which used to be discarded, also has cosmetic and therapeutic values (Grozeva and Turk, 2005), as does the mud underlying salt pans and saline lagoons. Some salinas have become spas, where the public can partake in mud-baths, follow professional health treatments or just spend a relaxing day. Well-known salinas which now function as spas include the Dead Sea, Pomorie in Bulgaria and Mar Menor in Spain. Small-scale salt baths have opened in other areas, too, such as the inland salt lakes of Aragón, Spain, where the remnants of the early twentieth century bath houses can still be seen on the shores of the lakes, such as the large one at Bujaraloz in Saragoza, Spain.

Although not strictly related to the cultural heritage of salinas, it is worth mentioning that salinas are also rich in biological by-products which have numerous applications. Plants growing in hypersaline soils can be eaten (such as \textit{Salicornia europaea}) or transformed into cosmetics (\textit{Salsola soda}, \textit{Suaeda maritima}). The ever-present crustacean \textit{Artemia sp.} is a popular food for aquarium fish, although large quantities are required to make this a profitable business. Perhaps

\textsuperscript{26} http://www.aegean.gr/alas/, checked 8 April 2011.
\textsuperscript{27} http://www.sal-atlantic.net/, checked 8 April 2011.
\textsuperscript{28} http://ecosal-atlantis.ua.pt/, checked 8 April 2011.
most promising of all are the industrial and biotechnological applications of microalgae and hypersaline bacteria (e.g. *Halobacterium* sp.) which are currently being developed. These microscopic organisms can be added to food supplements, cosmetics, electrical conductors and biofuels. An environmentally sustainable use of these resources can help maintain a salina’s ecological balance by respecting the life cycle of the biota involved, and therefore preserving the ecosystem’s values.

An overall advantage of the multi-purpose production of salt and its by-products is the creation and maintenance of employment. A combination of traditional salt-making and high technology can guarantee the preservation of the intangible cultural heritage, while offering higher level jobs and providing a higher quality of life for employees and for those more indirectly associated with the process. Socio-economically, the recovery of a saltscape and its associated salt-making activity reinforces the identity of the site and its inhabitants’ sense of belonging, thereby potentially strengthening its attractiveness to visitors, policymakers, investors and other stakeholders.

With a sound management plan, all these uses of salinas may be compatible with the preservation of their cultural heritage. Most importantly of all, their continued use will be sustainable from an economic, social and environmental point of view. We agree with Jean Pierre Corlay’s axiom (2006) that salinas should be saved by people since they are made by people. This will be a great task for environmental education in the years to come (Fig. 3.31).

**Fig. 3.31** A Mediterranean saltscape seen through the eyes of a 10 year-old child, Iliana Apostolopoulou, Lesvos, Greece.

This is a painting drawn in the context of the ALAS project (All About Salt; http://www.aegean.gr/alas/, checked 8 April 2011).
Referencias


Guerrero, M. C. and de Wit, R. (1992), Microbial mats in the inland saline lakes of Spain, *Limnetica*, 8, 197-204.


Sečovlje Salina Nature Park, Slovenia: Latest developments and important cultural activities

Andrej Sovinc

Abstract

Sečovlje Salina in Slovenia in the north-eastern Adriatic is an extremely important area in biodiversity and cultural heritage terms. Its main values are maintained through the process of traditional salt-making which offers opportunities for ecotourism, organic products and local community development. The area has been designated a Nature Park by the government of the Republic of Slovenia, and its management entrusted to a private company. This model of management can be accepted and encouraged, especially in the present climate of diminishing governmental support for the protection of natural areas and cultural heritage sites.

Keywords: Traditional salt-making, salt-works, nature conservation, cultural heritage, Slovenia

Description of the area

Sečovlje Salina covers an area of more than 650 ha on the southernmost stretch of the coast of Piran Bay (Piranski zaliv) in the Dragonja River estuary in south-western Slovenia. The coastal alluvial plain has formed over the centuries as a result of the continuous deposition of sediments in the Dragonja River estuary. At least 700 years ago (but perhaps even earlier), people created basins for evaporating seawater, and nothing much has been changed since then in the landscape or the ecosystem. Over the centuries, several different habitat types have evolved in this area, all of them dependent on the saltwater environment but also on the presence of humans. These habitat types provide space for very particular flora and fauna species, and Sečovlje Salina is particularly known for its birds, halophilous plants and species like the brine shrimp which favour hypersaline conditions.

Until the late 1960s, people controlled the water circulation and took measures to prevent flooding from the sea within the entire salina. In that earlier period, active salt production was undertaken in both distinct parts of the salina: Lera and Fontanigge. Salt production at Fontanigge then stopped, along with the regular maintenance of embankments and sea-defence walls. This area has been partly left to nature, which has provided an even higher diversity of habitats and attracted several additional species. Fontanigge today represents the core conservation zone of the Sečovlje Salina Nature Park, and no commercial salt production takes place there any longer.
Lera is an intensively managed area for salt production, but the production methods are traditional and thus allow the coexistence of man and nature, salt and culture, history and the present day. Lera forms another conservation zone in accordance with to the zonation of the Nature Park, where continuing the traditional salt-making process is a mandatory requirement in order to maintain the saline ecosystem and its functions and to meet relevant biodiversity, cultural heritage and landscape conservation objectives.

Of the once numerous salt-pans in the Gulf of Trieste, only those at Sečovlje and Strunjan have been preserved. They are therefore of exceptional representative value in terms of the area’s ethnological, technical, historical, settlement and landscape heritage.

The cultural heritage of the Piran salt-pans reflects the centuries-old life and work of the salt-workers on the north-eastern coast of the Adriatic Sea. The oldest heritage has been preserved in the Fontanigge basin of the Sečovlje Salina, where ruins of the old salt-pan houses and traces of salt-fields, levees and channels are still present. The Old Piran salt-pans’ cultural heritage has been preserved and exhibited in the Museum of Salt-making on the banks of the Giassi Channel. This museum was housed in a complex of restored traditional salt-workers’ houses, and includes restored salt fields demonstrating traditional methods of salt production. The reconstructed buildings and salt fields initiated an educative type of tourism in this part of the salina. The salina’s history is closely related to that of the town of Piran and to the local people. The remains of around 400 houses in which the salt-workers and their families once lived (in the warm half of the year) are to be found on the site.
The tangible heritage of the salt pans includes still-functioning as well as abandoned salt-fields, channels and levees with stone walls, steps and sluice gates (with only their stone parts preserved), salt-pan houses and their immediate surroundings, paths, bridges and wind pumps.

The Strunjan and Sečovlje salt pans are unique on the eastern Adriatic coast in producing salt by means of an entirely traditional process which involves the daily gathering of the brine on the biosediment – the petola. During the physical and technological development of the Slovenian coastal salt pans, there have been several important turning points. One of them was in the fourteenth century, when ‘petola’, an artificially grown crust, was introduced into the crystallisation basins of the salt fields. The crust consists of green algae, gypsum, carbonate minerals and – to a lesser extent – clay, and has two functions: it prevents the mixing of the salt and the sea mud on the bottom of the crystallisation basin, and it functions as a biological filter.

In 1993, Sečovlje Salina was designated Slovenia’s first Ramsar Site (Škornik et al., 2004).

**Management and current situation in the area**

Several changes have occurred in the area of the Sečovlje Salina Nature Park (SSNP) since 2003, when the management of the area was entrusted by the Government of the Republic of Slovenia to the salt-making company SOLINE Pridelava soli d.o.o.

Sečovlje Salina Nature Park is the first state-designated Park in Slovenia whose management has been handed over to a commercial company. The site is managed according to guidelines included in the decree establishing the Nature Park and implemented through a management plan approved by the Government. In exchange for its contributions to the protection and management of the heritage of the area, the management body (Soline company) is granted the right to exploit the income-generating potential of salt-making, tourism and other activities in the area within the limits laid down in the decree establishing the Nature Park. By taking special measures to safeguard various natural processes in the area, the company can thus engage in sustainable development, while its implementation of measures concerning the protection of natural and cultural heritage raises awareness of the importance of protecting the Nature Park. The management of the area and its potential impact on the region’s natural and cultural heritage is overseen by national institutes for the protection of nature and the protection of cultural heritage.

Due to changing conditions in the European market for salt in the twentieth century, especially after World War II, operators of traditional salinas in the northern Adriatic found themselves in the difficult position of having to compete with salt producers in North Africa, who began to enter the European market.
The cost of producing salt in Africa is lower than in the northern Mediterranean, the production rate is higher due to the warmer and sunnier climate, and industrialised salt production methods also reduce costs. This is why many of the northern Mediterranean salinas were abandoned, including that in the Fontanigge part of Sečovlje Salina. In Lera, salt production was somehow maintained, but at the cost of little or no maintenance being undertaken on the sea-walls, dykes and embankments; due to the lower prices of North African salt, traditional salt production almost stopped even here. The new management has developed new marketing strategies. Sečovlje Salina is now known as the area where ‘only the clothes of the salt-workers have changed in the last 700 years’, and where salt is still produced in the way it was several hundred years ago using traditional skills and tools. The salt produced is considered a purely ‘natural’ product (with no additives or grading) and therefore occupies a distinctive ‘niche’ in the market. Around 25 salt-fields have been reconstructed, together with tens of kilometres of defence walls and dykes. Several young people were employed to work as salters, learning the techniques from older people in possession of the traditional knowledge. In 2003, there were only some 15 employees, but today over 80 people are employed full-time in the production and marketing of salt and in the management of the Nature Park; and an even larger number find temporary work (especially during the salt harvesting season), while indirect employment is created in the local community, through services supporting the salina or visitor-related services. Annual visitor numbers have increased five-fold over the past seven years, and have reached 40 000 visitors per year. The Lera area has been revitalised, along with some 20 associated historical buildings, including storage houses and salters’ huts, an exhibition area and gift shop. Depending on weather conditions, in good years up to 3000 tons of salt can be harvested per season. It should be stressed that in Sečovlje Salina, salt is harvested daily between July and September in a non-mechanised process using only traditional wooden tools.

Fig. 3.33 Lera – active salt fields in Sečovlje Salina.
The situation is different in Fontanigge, the other part of Sečovlje Salina. This area is still used for collecting water for use in salt production at Lera, but the crystallisation fields no longer exist (with the exception of the area where the Museum of Salt-making produces salt exclusively for demonstration purposes). The most important relics of cultural heritage are also found at Fontanigge. Remains of the typical salters’ houses are still present, along with traces of salt fields and channels. There are very few salinas like this where salters once lived (with their families) in stone houses built along the channels of the salinas. Thanks to the efforts of enthusiastic professionals, the non-material values of the salters’ culture is also relatively well-documented.

Until recently, when the salina was allowed to decline almost to the point of destruction, there was very low interest in the area. Now this situation is changing; many investors are coming to explore the area and to assess its potential for economic development. Unfortunately, the majority of proposed investments have little or no connection with the safeguarding of natural or cultural values. Most include extending the facilities of the nearby airport into the area of the SSNP, and converting the ruins of the salters’ houses into apartments for tourists or residents.

Luckily, all these plans will have to be developed elsewhere as the EU has approved funding under the ‘LIFE+’ scheme for an extensive restoration project in the area which will seek to secure water control regimes that will be of particular benefit to endangered species and habitats. The area’s cultural heritage will benefit from the project, too, which also seeks to address the uncontrolled flooding that has caused severe damage to some cultural monuments in the past. EU money for reconstruction of the dykes and embankments also means that no unsustainable investments that might be harmful to the character of the area will be introduced here in the next few years at least.

**Cultural activities of particular importance**

**Traditional salt production**

Traditional salt production is an essential element in the conservation of both the natural and cultural heritage of this area. A prerequisite for well-managed salt production is an appropriate infrastructure including ‘on-site’ activities (such as well-prepared basins, properly controlled water inflows and outflows, groundworks, ‘petola’ growing etc.), as well as other activities on a wider scale (measures to prevent the flooding of the salt-pans, maintenance of the system of channels, etc.). All these activities can support the cultural traditions of salt production (with the use of traditional techniques and tools, the maintenance of infrastructure facilities, and high quality standards for the salt product). The management of water regimes and habitats is also essential for the production of salt, as well as being vital for valued habitats and species.
This traditional coastal salt production is one of the few economic activities which only have a minor impact on the natural environment, and in fact have some favourable consequences for the conservation of biological diversity and for the area’s natural equilibrium. The daily manual collection of salt produced from saturated marine brine by solar evaporation in pans lined with a layer of ‘petola’ biosediment is a method that is centuries old. It is also essential to keep the canals that are part of the characteristic landscape of the salt pan areas free and navigable. These methods of salt collection are still used in the salt pans of Sečovlje and in nearby Strunjan. Minor modifications to the method of salt making were introduced in 1904, when the Istria Region was administered by the Austro-Hungarian empire.

![Image of visitors at Sečovlje Salina](image)

**Fig. 3.34 Visitors of the Sečovlje Salina are offered the experience of traditional salt work.**

**Cultural events, portrayal of traditional salt-making in the Museum and other activities related to the cultural values of the area**

The area of Sečovlje Salinas is embedded into the typical cultural landscape of the Istrian peninsula. The area is linked to the Dragonja River valley by a landscape mosaic of arable land, vineyards and grasslands containing picturesque villages such as Krkavče and Koštabona. Local tourist events are common in these settlements, and a network of walking and cycling paths and ‘wine-roads’ is well-established. A typical feature of this part of Slovenia is the osmice, when for a few days of the year some farmhouses open their doors to visitors and offer traditional food and wines.

The arrival of the salters at the salt-works (on the last weekend in April), the beginning of the salt harvest (on the first weekend in July) and the return of the salters to their homes (on the last weekend in August) are celebrated as ‘The Fiestas of the Salters’. The local community and the municipality of Piran organise special cultural and folk events on these occasions.
The cultural heritage of the area also attracts artists to work there. Each year, their work is exhibited in Lera as part of the Lera Genius Loci event. Hundreds of visitors enjoy the combination of historical heritage and contemporary artworks in this exhibition. The artists involved include painters, photographers, dancers, singers and poets.

The salters of the Sečovlje Salina are known for their particular folk traditions. They played their own distinctive games and sang their own particular songs. This is all now presented in a new way to a particular type of visitor in a context of ‘team-building’, whereby companies bring their employees to the area for a day to learn about and role-play the traditional salters’ life as a training exercise.

One particular salt-field area has been reconstructed specifically to demonstrate the salt-making process to visitors. Here, a programme known as ‘become a salter for a day’ has been developed. Visitors wishing to learn about traditional salt-making are welcomed by experienced salters who demonstrate the production process; the visitors are allowed to take a sample of the salt they gather home with them.

In the Museum of salt-making, there is a long tradition of organising workshops for young people from all over Europe who are interested in learning about the traditional life of a salter. These young people are invited to engage in every phase of the salt-production process, allowing them to share their experiences of the cultural and natural values of the area with others on their return home.

**Conclusions**

Sečovlje Salina is regarded as one of the ‘crown jewels’ of Slovenia’s natural and cultural heritage. The strategy of investing in heritage conservation and the main-
The maintenance of traditional salt production has proved an effective one, which produces benefits both for the operating companies and the local community. Traditionally-produced salt is marketed as a ‘green product’, which generates revenue for the management authority and supplements the incomes of people in the protected area. These benefits are largely based on a visitor-driven market, which in turn depends on the cultural values of the area being maintained.

Ad hoc surveys conducted by the management authority in recent years among visitors to the area have shown that interest in nature and the traditional salt-making process is one of the key reasons for visiting the Sečovlje salt-pans. Visitors generally declare themselves very satisfied with their visit, though many also express a wish for enhanced visitors infrastructure and the provision of additional information on the site.

By combining ecotourism, which takes into account the primary management objectives of protecting biodiversity, with cultural heritage and methods of organic production, traditional productive activities (such as salt-making) can be sustained both financially and socially.

The management model of the Sečovlje Salina Nature Park indicates that the role of the private sector in managing protected areas can be accepted and encouraged, especially in this financially difficult period, when governments need to reduce expenditure, and the protection of natural and cultural assets does not rank high on government agendas.

Reference
3.5 Water supply and use

Water is the basic constituent of wetlands. On the one hand, the functioning of wetland ecosystems depends on water, meaning its quantity, quality, degree of salinity, but also its seasonal and extraordinary variations. On the other, freshwater in wetlands is an invaluable resource for domestic use, for irrigation in agriculture, for watering in stockbreeding and as a major component in various industrial processes. The Greek Public Power Corporation used water from Lake Vegoritida to cool its nearby thermal power plants for many years, leading to a substantial lowering of the lake level. These multiple uses have often led to conflicts.

The importance of water has been widely recognised in the Mediterranean, reinforced in particular by the scarcity of this natural resource in the South and East of the Basin. This has led to the development of collective social structures for managing water equitably and efficiently in relation to land use. Although the emergence of centralised nation states has greatly weakened these structures, especially in the more technologically developed countries, they still exist, incorporating valuable knowledge and experience and remaining valid in more modern contexts. Traditional water-management structures retain a variety of values ranging from tangible infrastructure works to intangible social practices. Nowhere is this more striking than in the oases of Algeria and Tunisia (Perennou, 2008).

Ramsar Guidance

The Ramsar Guidance (Ramsar Guidance, p. 53) provides for the preservation and appropriate use of traditional management systems, as indicated below.

O.2.8 –
To preserve collective water and land use management systems associated with wetlands

Among the actions required are the following:

a) identify, analyse and record collective water and land use management systems;
b) assess the possibility of the maintenance of such systems or, if this is not possible, their partial integration in contemporary management systems;
c) preserve and enhance the tangible elements associated with these systems;
d) incorporate the results of these actions in educational and public information activities; and
e) work with local government structures and civil societies to enlist their participation in the maintenance of these systems.
This advice could perhaps be more explicit with regard to the preservation of the cultural aspects associated with particular traditional management systems. Thus, physical structures for the management of water (such as canals, weirs, jetties, water mills and wheels) could be kept in use, while their operation and role should be interpreted in wetland visitor centres and eco-museums. The intangible implications they have for social structures, as well as their evolution and functioning, should be studied and documented, and lessons learned from this should be factored into the design and operation of contemporary management systems.

As water plays an important role in various religions, for example for purification and baptism, such spiritual aspects must also be considered in the management of this vital resource. This issue is dealt with extensively in Section 5.3 of this book, p. 343.

**Water management and wetlands**

George Parisopoulos of the National Agricultural Foundation of Greece provides an expert view of water management challenges in the Mediterranean region. Land reclamation, malaria eradication and urbanisation continued to encroach massively on Mediterranean wetlands until the late twentieth century, while the same wetlands face a host of other serious threats. Parisopoulos proposes that people must tackle these threats quickly using adaptive management techniques, and take measures that boost the resilience of wetlands by making use both of traditional knowledge and contemporary scientific research.
Water management challenges in the Mediterranean: past, present and future

George Parisopoulos

Abstract
The Mediterranean Basin exhibits significant climatic, geomorphic, cultural and socioeconomic variability. Water resources in most parts of the basin are limited and fragile. The basin hosts numerous important wetlands, ecosystems known to be strongly dynamic and sensitive to water availability. Water management of a wetland, which is designed to secure adequate volumes of good quality water to support all internal processes (physical, chemical, physicochemical, biological and biochemical) that are necessary for the wetland’s functions, should be based on a water management plan for the entire catchment to which the wetland belongs. The catchment’s hydrology and water resources management and allocation determine the wetland’s boundary conditions.

Massive losses of wetlands in the Mediterranean region occurred until the late twentieth century, primarily due to land ‘reclamation’ for agricultural production, malaria eradication and urbanisation, along with water pollution, dam construction, water transfer schemes and groundwater abstraction at rates exceeding the aquifers’ safe yield. Present and future wetland water management is challenged by increases in water demand mainly due to population growth, the rise in living standards and the expansion of irrigation and tourism, but also by the impact of climate change, mainly in relation to sea level, temperature and precipitation. Priority should be given to adaptive management plans for quickly responding to changes, as well as measures designed to enhance the wetlands’ resilience.

Keywords: Wetland, wetland management, Mediterranean wetlands, water management

Water resources in the Mediterranean Basin
The climate in the Mediterranean Basin, which extends from 5°W to 40°E and from 25°N to 45°N, is characterised by dry hot summers and cool wet winters. In the northern and north-western regions, precipitation reaches 900 mm/year, whereas in the southern regions it can be as low as 100 mm/year (Ornat and Morales, 2002). The seasonal variation in rainfall is significant (Mehta and Yang, 2008). The mean monthly precipitation distribution pattern during
a calendar year has a ‘U’ shape, with its minimum in summer, while monthly temperature distribution has an inverse ‘U’ shape with its maximum in summer. In the south-eastern part of the basin, the distribution of precipitation events in time and space is markedly uneven, and a significant proportion of the annual precipitation may come from a few stormy rain events, typical in arid regions, which generate flash floods in wadis (Wheater et al., 2008).

The potential evaporation in the Mediterranean Basin is higher than the precipitation, and water deficit averages 2.4 mm/day; however, there is a significant east/west gradient ranging from 3.5 mm/day in the eastern part of the basin to about 1.1 mm/day in the western part (Romanou et al., 2010).

This deficit is the main natural cause of the limited water availability in the basin. Traditional societies were adapted to this condition and had developed a compatible—and thus wise—water-use culture which resulted in the conservation of available water resources. Some water works, dating back centuries, incorporate significant relevant knowledge on these issues as well as impressive technical skills.

One very well-known traditional and sophisticated water management system used in arid and semi-arid regions is the qanat (known as foggaras in North Africa). Qanats are underground water works which intercept the ground-water and transport water to human settlements or fields with limited evaporation losses (Todd, 1980). They are constructed as a series of well-like vertical shafts connected by gently sloping tunnels. The technology is known to have been developed in ancient Persia, but it has been used all over the southern and eastern Mediterranean (North Africa and the Middle East). Another example of the wise utilisation of available water resources, which is found on most of the Aegean islands and in the Middle East, is the harvesting and storage in underground cisterns of the rainwater runoff from the roofs of houses. This decentralised and carefully-husbanded management approach has often been ignored in recent decades by contemporary government authorities, engineers and planners. What is more, typical contemporary practice involves excessive pumping from aquifers, construction of dams, water transfers by ships, or installation of desalination plants for the satisfaction of an increasing demand for water which is partly driven by irrational or even provocative uses such as the irrigation of lawns belonging to luxury hotels and villas in even the driest areas.

Water resources in the Mediterranean Basin are thus overexploited at present to satisfy the continually growing water demand driven mainly by population growth, the increase in per capita consumption due to rising living standards, expanding irrigation, fast-growing tourism activities and industry (Isendahl and Schmidt, 2006). The use of water in many parts of the Basin—despite relevant scientific knowledge and technology being available—is still irrational and short-sighted, as consumers tend to consider all their water demands to be legitimate and to demand that they be met at any environmental or economic cost. This approach has led to strongly adverse
or even catastrophic consequences both for surface waters (construction of too many reservoirs, overexploitation of natural lakes and wetlands) and groundwaters (dramatic lowering of water tables and seawater intrusion into coastal aquifers).

Domestic and industrial wastewater effluent and runoff from intensively cultivated land where agrochemicals are extensively used have also resulted in the pollution of water resources (surface and underground) to an unprecedented extent. In order to alleviate this, wastewater treatment plants have been constructed primarily in the wealthy countries of the north, and reclaimed water is often re-used. One notable treatment technology used currently (constructed wetlands) is based on processes occurring in natural wetlands. It should nevertheless be emphasised that the quality of a water body (especially an aquifer or lake) is not generally recovered until some time after the elimination of the polluting source. Precautionary measures for pollution control are therefore of immense importance in ensuring that a water resource and its related ecosystem are not degraded in the first place.

Future water resources availability in the Mediterranean is likely to continue to decline, due to the expected significant increases in population and economic development, and the consequent increased demand for water (Cudennec et al., 2007). Under these conditions, wetlands will experience severe pressure, and their survival will ultimately depend on the value that society assigns to them: only with proper attention and conservation will they be able to compete successfully with all the other demands that will be made on water and land.

**Mediterranean wetlands: Causes of loss and threats from climate change**

Wetlands are unconfined, water-dependent, dynamic ecosystems, many of which change naturally over time due to internal processes as well as changes in their boundary conditions29 (Mitsch et al., 2009). Natural changes are often gentle enough to allow the system’s functions to adapt. Typical cases are the filling up of inland wetlands with sediments entering from surrounding areas and inflowing rivers30, and analogous changes caused by sediment deposition in coastal wetlands, especially in the deltas of large rivers. Flow features of input waters such as discharge, velocity, sediment load, water quality (e.g. temperature, pH, nutrients, metals, micro-organisms) as well as site characteristics (e.g. geological, morphological) determine the evolution and ‘life-span’ of many wetlands. As long as the natural processes remained undisrupted, the evolution of wetlands in the Theraikoas Bay in Greece (Fig. 3.36) constitutes a typical example of the sedimentation effect on wetlands (Poulos et al., 1994; Day et al., 1995).

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29 Boundary conditions are the physical conditions at the limits of wetlands: e.g. no-flow, constant flow, constant pressure etc. When the water table in the greater area is lowering, we get changes in the boundary condition.

30 Non-point runoff /sedimentation as opposed to point-sources runoff / sedimentation (entering through a concrete conveyance, such as a pipe or ditch).
In the Mediterranean, despite the restricted availability of water, especially in the south, numerous wetlands exist all around the Basin in both inland and coastal situations, and of all sizes (Papayannis, 2008). Most of these wetlands are used intensively by local people who have evolved sophisticated systems for regulating them. The presence of wetlands has for thousands of years been incorporated into every form of expression of the region’s cultural heritage. Their number has, however, been falling in recent decades, while a significant proportion of those that are left are facing reductions in size and a degradation in quality.

Humans have attempted to transform wetlands into agricultural or urban land throughout history. In pre-industrial times, however, such interventions in the natural world were generally limited in number and size due to financial and technical limitations, and did not generally threaten the condition of wetlands. Some drainage projects were nevertheless of an impressive size. For example, in ancient Greece, the land ‘reclamation’ of Lake Kopais in the fourteenth century BC by the Mycenaeans (Tassios, 2006), involved:

(a) a dam (1 km long), north of Orchomenos, for storing the waters of the Melas River in an artificial lake (12 sq km); and

(b) a diversion, 2 km north-east of Orchomenos, of the Kephissos River into a 25 km long channel which conveyed the water along the northern side of the valley to exit at its eastern end: this karstic limestone channel had a width of 40 m and a depth of 2.5 m.

It is interesting to note that the Lake Kopais re-established itself after the abandonment of these drainage works. Subsequently, the lake survived for centuries until late in the nineteenth century, when it was drained once again in order to provide 24 000 ha of fertile land.
Losses and degradation of wetlands by human actions increased drastically after the Industrial Revolution (eighteenth-nineteenth centuries), as humanity’s capacity to undertake huge works with the use of engines allowed the exploitation of natural resources to an unprecedented extent. The loss of wetlands over the last 100 years in Thermaikos Bay in Greece, as one example, is shown in Fig. 3.37. Today, the remaining areas are still in danger despite their designation as protected areas under national, European and international law.

![Fig. 3.37 Loss of wetlands over the past 100 years in Thermaikos Bay, Greece.](image)

The main causes of wetland loss due, directly or indirectly, to human actions can be summarised as follows (Dugan, 1990):

**Direct human actions:**
- Drainage for agriculture, forestry, urbanisation and mosquito control.
- Dredging and stream canalisation for navigation and flood protection.
- Infilling for solid waste disposal, roads and commercial, residential and industrial development.
- Construction of dykes, dams, levees and sea-walls for flood control, water supply, irrigation and storm protection.
- Construction of pumping stations and wells for water supply and irrigation.
- Discharge of pesticides, herbicides, nutrients and heavy metals from domestic and industrial sewage, agricultural runoff and soil erosion.
- Mining of wetland soils for peat, coal, gravel, phosphate etc.

**Indirect human actions:**
- Sediment diversion by dams, dredged channels and other structures.
- Hydrological alterations by canals, roads, urbanisation and groundwater abstraction.
- Subsidence due to the extraction of groundwater, oil, gas and minerals.

In recent decades, fast-growing demands due to social change have instigated a move away from traditional, carefully-husbanded uses of water to modern, affluent, often irrational and wasteful uses. This has led to more intensive water resource exploitation, with wetlands as its first victim. The underlying reason why wetlands have been allowed to be destroyed is, as Dugan (1990) asserts, that ‘society has viewed eliminating them as either good in itself or as a small price to pay for the
benefits expected from wetland conversion’. Now that the impact of wetland elimination on water resources and ecology are indisputable, thanks to the work of the scientific community and international environmental organisations, such policies and the plans associated with them are socially and economically indefensible.

Nevertheless, future challenges to the survival of wetlands in the Mediterranean may now have more to do with regional climate change projections based on global and regional climate models. The critical factor affecting each simulated outcome is the greenhouse gas emission scenario which has been adopted. Climate projections for twenty-first century Mediterranean and Europe (Christensen et al., 2007) are extremely worrying, as it is anticipated that:

- Annual mean temperatures in Europe are likely to increase by more than the global mean.
- Seasonally, the greatest warming is likely to be in northern Europe in winter and in the Mediterranean area in summer.
- Maximum summer temperatures are likely to increase in southern and central Europe more than the global average.
- Annual precipitation is very likely to increase in most of northern Europe and decrease in most of the Mediterranean area.
- The annual number of precipitation days is very likely to decrease in the Mediterranean area.
- The risk of summer drought is likely to increase in central Europe and in the Mediterranean area.
- The duration of the snowy season is very likely to shorten, and snowfall is likely to decrease in most of Europe.

Based on simulations, the temperature is predicted to rise by between 1.6 and 3.1 °C by the year 2050, and between 2.5 and 4.8 °C by the year 2100. Predicted spatial and seasonal temperature and precipitation changes are shown in Fig. 3.38.

Fig. 3.38 Temperature and precipitation changes (annual, winter, summer) for 1980-1999, and projected changes for 2080-2099.
Water management challenges

Wetlands are biological systems with internal biochemical cycling and metabolic productivity (Wetzel, 2001), the sustainability of which is the ultimate goal of an effective management regime. The physical, chemical, physicochemical, biochemical and biological processes in wetlands are often particularly complex and strongly dynamic, and therefore understanding and managing such ecosystems can constitute a real challenge.

Fig. 3.39 Schematic representation of wetlands in a catchment.

Any wetland, whether inland or coastal, forms part of a drainage basin (Fig. 3.39). As a result, wetland hydrology studies and water management plans can neither be conducted in isolation nor implemented independently from the basin context (Hollis, 1992). Hydrological processes, water uses and infrastructure in the upper as well as the lower parts of the basin determine the boundary conditions of a wetland site and affect its water mass balance. Both the quantitative and qualitative hydrological characteristics of a given site are space- and time-dependent. Space refers to surface, sub-surface, upstream and downstream features of the water resources, while variation in time suggests that systems analyses have to be considered in both the short and long terms.

According to Mitsch and Gosselink (2007), climate, hydrology, mineral sediments, organic matter, flora, fauna, related human activities, water ethics and the culture of the region are some of the many important components of a wetland and its environment that would have to be examined in any management study, although ‘hydrology is probably the single most important determinant for the establishment and maintenance of specific types of wetlands and wetland processes […] when hydrological conditions change even slightly the biota may respond with massive changes in species richness and ecosystem productivity’.

The simplest—and most important—function in the successful water management of any system, independently of its size, is the mass balance of the water stored
The general expression of this for a time period $\Delta t$ (between time steps $t-1$ and $t$, noted as $t-1,t$) is given in Eq. 1.

$$\Delta V_{t-1,t} = Q_{in, t-1,t} - Q_{out, t-1,t}$$ (1)

where:
- $\Delta V_{t-1,t}$ is the change in water volume stored in the wetland
- $Q_{in, t-1,t}$ is the total water volume entering the wetland (inflow)
- $Q_{out, t-1,t}$ is the total water volume leaving the wetland (outflow).

Water mass balance can be expressed in a more analytical form, exemplified in Fig. 3.40, as presented in Eq. 2.

$$\Delta V_{t-1,t} = (P_{t-1,t} + O_{in, t-1,t} + GW_{in, t-1,t}) - (ET_{t-1,t} + O_{out, t-1,t} + GW_{out, t-1,t})$$ (2)

where:
- $P_{t-1,t}$: Precipitation
- $ET_{t-1,t}$: Evapotranspiration
- $O_{in, t-1,t}$: Overland inflow
- $O_{out, t-1,t}$: Overland outflow
- $GW_{in, t-1,t}$: Groundwater inflow
- $GW_{out, t-1,t}$: Groundwater outflow

Note: $X_{t-1,t}$ is the volume of water of component $X$ entering or leaving the wetland during a time period $\Delta t$ (between time steps $t-1$ and $t$)

Mass balance analysis applies also to water quality components (e.g. sediments, nutrients, metals, biomass), although in most of these cases internal processes (chemical, physicochemical and biochemical reactions) strongly affect the ultimate outcome.

Climate change-induced hydrological changes in the Mediterranean region should be examined at catchment scale when aiming to estimate the impacts on wetlands. It is important to note that rainfall reduction, temperature increase and sea level rise will affect water availability (Mariotti et al., 2008). Net effects on water availability from rainfall reduction are likely to be larger than the amount of the reduction itself, since overland runoff occurs only once soils are saturated. For example, a 10% rainfall reduction may cause a 20% or 30% reduction in...
overland flow. Temperature rise will result in higher evapotranspiration and, both directly and indirectly, to a consequent increase in risks of water deficit (for example, due to higher demand for irrigation). Aquifers, many of which are already overexploited, are expected to suffer additional pumping, which may lead (especially in coastal cases), to their permanent destruction.

Sea level rise is of immense importance for the future of coastal wetlands, due to consequent changes in hydrological conditions which are represented schematically in Fig. 3.41, and to changes in salinity. Measures to reduce adverse impacts such as the construction of coastal embankments can sometimes be environmentally questionable, costly and ineffective at addressing subsurface salt-water intrusion.

![Fig. 3.41 Schematic representation of surface and groundwater changes in coastal wetlands due to a rise in sea level.](image)

The continuous increase in water demand due to human activities related to economic growth, in conjunction with the existing stresses on water resources in the Mediterranean Basin, often lead to water catchment management plans that undervalue wetland water needs and focus only on urban, industrial and agricultural water demands. This anthropocentric approach is expected to be less prevalent, particularly in EU Member States, following the implementation of the Water Framework Directive (EU-WFD, 2000), which sets out water management objectives including:

– protecting all forms of naturally occurring water in the environment;
– preventing further deterioration, and protecting and enhancing the status, of aquatic ecosystems and (in respect of their water needs) terrestrial ecosystems.

In addition to the importance of securing adequate water volumes of good quality for wetlands through water management at the catchment scale, there are many other water management issues within a wetland that are of vital importance for sustaining it in a healthy condition. These can include water level fluctuation, the flooding of wet meadows, outflow discharge and its distribution across the year, the rate of water renewal (hydraulic retention time), internal water circulation and thermal stratification, among others, all of which should be analysed, and (if possible) controlled, through a meticulous management regime for the wetland itself (Parisopoulos et al., 2009). In Greater Prespa, an interna-
tional, natural lake of great ecological value shared by Greece (90%) and Albania (10%), the temporal variation in water level as well as the rate at which it rises or falls impacts decisively on most functions of the ecosystem. The lake is also a water resource which covers the area’s agricultural water demands. However, the water-level requirements for sustaining a good ecological status and a healthy local economy (farming, fishing, tourism) are not fully compatible. Thus, in order to secure both of these important values for the area, a lake water-level management plan was formulated following extensive dialogue between local stakeholders and implemented in 2004 with the construction of four sluice gates to control outflows and thus the lake water-level. The project has proven particularly successful, and has enhanced understanding and cooperation between the stakeholders.

A holistic river basin management approach aimed at the sustainability of water resources and the natural environment is now often a goal shared by the scientific community and water authorities (Mays, 1996; EU-WFD, 2000). Adaptive management is an attractive approach, though it relies on being able to continuously monitor the responses of both society and the environment, and then analysing them to permit rapid and well-documented management modifications (European Environment Agency, 2007).

The water management principles for securing the essential ecosystem services which wetlands provide human society can be condensed into two: the limitation of all non-climate stresses by exercising best practices, and a fair allocation of available water resources to different uses. The aim is to reserve enough water for the critical factors supporting a wetland system to be sustained at a level that can support its good ecological status. The most important of these factors (Ibáñez et al., 1997) are:

- Freshwater inputs, either surface or subsurface, of an adequate volume and good quality of water, with a seasonal distribution corresponding to the unmodified hydrological processes of the region.
- Sufficient water storage, and outflows to downstream natural watercourses, ensured by controlling direct and indirect water abstractions.
- Activities within the wetland being compatible with the hydrobiological functions and characteristics of the ecosystem.
- Conservation of hydrological connections and interactions with nearby bodies of water (streams, rivers, lakes, springs, etc) which directly or indirectly affect the functions of the ecosystem.
- Preservation of geomorphological features within the wetland, such as shore structure and bottom relief.
- Undisturbed sediment balance.

Since wetlands are complex systems and the Mediterranean Basin displays hydrological sensitivity, the success of case-specific wetland water management
depends on knowledge of the dominant processes, early identification of changes and associated threats, and the concentration of efforts and available resources to secure the specific processes that are critical for each wetland.

Measures to alleviate water resource depletion caused by climate change usually focus on improving the infrastructure (repairs and technical upgrades), expanding water-use systems and constructing new reservoirs rather than controlling the continuing increase in water demand (UNECE and WHO-Europe, 2008). The construction of new reservoirs and expanded distribution infrastructure is often incompatible with wetland conservation, and such an approach, if adopted as general practice, will certainly lead to further wetlands loss or deterioration.

Current operational water management decisions should secure reliable monitoring, demand management, operating rules for infrastructure, fair water allocations to all uses and the re-use of reclaimed water. To address climate change impacts, there is an urgent need for capacity building, development of reliable forecasting models, better planning of land use and socio-economic strategies, and more thorough impact studies in relation to proposed infrastructure developments. In addition, the water management of traditional societies, which handled available water carefully and respectfully (irrespective of whether this management was mainly driven by those societies’ limited means to develop and control water resources), should be studied and analysed in depth in the context of efforts to redirect the contemporary approach to water use, which has grown ever more wasteful over the last fifty years.

Community participation, although often undervalued by technocrats, is a key element in the successful implementation of adaptive measures, if these are to be developed through bottom-up as well as top-down approaches (Reid et al., 2009). Knowledge and strategies used by local communities in the past to cope with acute incidents of water shortage due to weather variability are of particular value, and should be studied and incorporated into management plans where appropriate. Requirements under legal frameworks such as the EU Water Framework Directive (EU-WFD, 2000) to involve the public in the water management decision-making process often go little further than meetings among bureaucrats. Therefore, there is a risk that wider society will perceive its views as not really being taken into account and consequently the measures to be implemented as ineffectual.

Although robust scientific knowledge concerning the values associated with wetlands has grown significantly in recent years, the goal of translating this into plans, measures and actions has rarely been achieved. Efforts to communicate the fact that it is in the interest of society as a whole to learn from the wise water use of traditional societies, and to share water with the natural environment, should be strengthened in the years to come, when water will be scarcer and even more precious.
Acknowledgements
The author gratefully acknowledges the helpful suggestions and comments of his colleagues V. Roumeliotou and D. Mantziou from the Society for the Protection of Prespa.

References


Secondary use of wetland resources

In Chapter 3, some of the direct uses by human beings of wetland resources were analysed. There are also secondary uses of these resources that provide benefits to human beings and are of economic interest. These include the following:

- Processing food from materials derived from wetlands such as fish, birds, frogs, plants and salt.
- Producing and using artefacts necessary for wetland-related activities—principally boats and associated craftsmanship.
- Using wetland materials—especially reeds—in building construction and heating.
- Tourism, leisure and sports activities in and around wetlands.

Most of these activities are set in a context of long-established traditions. Some of them have been abandoned or replaced in the contemporary era, or have mutated into other forms. Thus, traditional wetland boats, which were initially made from wood and reeds, have almost disappeared, as boats made industrially from artificial resins—which need less maintenance and are more economical—have supplanted them.

**Traditional wetland boats in Greece**

Special boats were developed in the Greek wetlands down the centuries which were characterised by their lack of a keel, so they could navigate in very shallow waters and could easily be pulled out onto dry land. They were called *gaites*, *stafnokaris* or *priaria* in western Greece (Pergantis, 1988d) and *plava* in northern Greece.

These boats were initially powered by a special form of sail and oars, although many fishermen now use outboard motors. The boats are pulled out of the water regularly and are coated on the outside with hot tar once or twice a year. Vassiliadis points out the similarities in construction between lacustrine dwellings and the fishermen’s boats. ‘... Building with wood, sailing on wood in a boat’ (p. 241).

Usually the boats are small, holding one or two fishermen. But on larger lakes such as Megali Prespa, larger boats with eight oars and four oarsmen were common before World War II. These boats were made by digging out a single log as late as 1924 (Athanassiadis, 1924).

<Fig 4.0 Traditional ladje boats, Neretva Delta, Croatia.>
Fishing [in Greek lakes] has not changed in its basic form through the ages. Various types of nets, hooks, lines and spears are still used (see Vafiadis, 1940, p. 48-56). In many of the wetlands of the area, fisheries were installed and the fish were usually caught at inlets. Most of the traditional fishing methods, equipment and boats still exist today, but they are disappearing fast. An effort should be made to preserve them in the major wetlands (especially in Messolongi, Amvrakikos and Prespa) for cultural reasons and as part of the ecotourism appeal of these areas.


Other references
Vafiadis, L. (1940,) Prespa and its Beauties, Athens (in Greek).

A new factor has now made its appearance: the synergistic combination of different secondary uses. The traditional heritage elements of wetlands attract visitors who are fascinated by each region’s amalgam of cultural and natural wealth. In the Neretva Delta (Croatia), for example, tourists participate in daily events that combine a guided visit to the wetland in traditional wooden boats with a tour of the adjoining archaeological site of Narona and a copious lunch featuring wetland-sourced foodstuffs (frog’s legs, eels, black hens) (Papayannis, 2008). This would seem to be a positive contribution to wetland conservation, which also provides additional income at the local level.
4.1 Food processing

Perhaps as a reaction to globalisation, interest in local and traditional gastronomy is growing around the Mediterranean, especially among the numerous visitors who come in search of meaningful experiences. Visitors who prefer to avoid mainstream tourist destinations and look for quality experiences during their vacations often appreciate original traditional food made using fresh ingredients produced by local farmers, as opposed to imported mass-produced food. This trend has been fuelled by the spreading ‘slow-food’ movement and concerns about healthy eating. In such a promising framework, wetland gastronomy occupies a relatively small niche, but its importance is growing, with both traditional and new products and dishes being developed.

The famous fish roe produced by fishermen from grey mullet in Orbetello Lagoon (central Italy) and the Messolongi wetland (western Greece), both Ramsar sites, is a good example. The *bottarga* or *avgotaracho*, smoked and sealed in wax, is an expensive high-quality delicacy which can be consumed as an appetizer or combined in more complex dishes (such as the delicious *linguine al bottarga*).

A number of interesting recipes based on wetland products have been recorded (Papayannis, 2008) such as carp onion soup (from Prespa Lakes, Greece), potato salad with pickled water-lily leaves, flowers and roots (from Neretva Delta, Croatia), and black rice (from Catalonia, Spain).

**Ramsar guidance**

Based on the work carried out in the Mediterranean, a new objective concerning the promotion of gastronomy based on wetland products is proposed for addition to the Ramsar Guidance (see Annex II, p. 411). This can be achieved by collecting and testing recipes in schools of gastronomy, and making them more widely known through appropriate means of communication and in wetland visitor centres. Tasting the local cuisine is one of the most basic elements of the travelling experience. Traditional local cuisine can, if promoted effectively, evolve into a central element of a tourist destination. Local restaurants in the vicinity of wetlands could benefit from including recipes involving wetland products on their menus. In addition, tourism organisers should be encouraged to include wetland gastronomy in their service packages.

It is hoped that the actions suggested above will increase interest in wetland gastronomy, with multiple benefits for all the parties involved.

In the first paper of this chapter, the social anthropologist and Med-INA associate Irini Lyratzaki describes how wetlands have been sustaining life for thousands of years and how food resources and culinary heritage are deeply embedded in human culture. Focusing on the Mediterranean region, she examines how local gastronomies can become a basic component of sustainable development and can benefit local economies, as ecotourism and cultural tourism gradually increase their share of the tourist market.
Food and culture, food and nature: food resources and culinary heritage in Mediterranean wetlands

Irini Lyratzaki

Abstract
Since prehistoric times, people have chosen to live near wetlands because the resources of these areas satisfied many of their needs. Wetlands provided an abundance of plants, fish and birds. Archaeological evidence indicates that our remote ancestors hunted, fished and cultivated fields around wetlands since the Early Palaeolithic era. These activities were mostly practised in environmentally sustainable ways, and were largely beneficial for both humans and nature. The peoples of the Mediterranean Basin share a lot of cultural—including culinary—heritage. Food is deeply rooted in the culture of each society, satisfying both the need for nutrition and more general well-being. Since ancient times, food has served as a means of communication with Mother Earth, family members and the broader community. A symbol of prosperity and abundance, it is ever-present at the most important moments in individual lives, symbolically connecting humans and their culture with the world of nature.

Keywords: Wetlands, wetland resources, food, culture, culinary, gastronomy

Wetland services
When we think about human habitation near wetlands, one question that comes to mind is why people chose to live near them thousands of years ago? Wetlands have tended to be considered as dangerous and hostile. They are mystical places, where land meets water and the natural approaches the spirit world. People have often told tales about otherworldly creatures appearing at night near lakes, rivers and springs, while numerous other superstitions and myths have always been associated with these places. The threat of malaria has also often been present.

On the other hand, wetlands provided ample supplies of the most important commodity, the one all life forms need to survive: water. Water availability has always been a prerequisite when people select locations suitable for habitation.

They have chosen to live near water and wetlands for a number of other reasons too: wetlands offered protection against fires; because the huts were built on wooden poles a few metres from the shore and connected with the mainland by temporary bridges, they offered protection against animals and other people; moreover, transporting goods and people by water was easier than doing so overland. Rafts, boats and canoes were in use, and wetlands would have been
easier to cross by boat than walking around them. Wetlands have also been considered places where the profane meets the sacred, where people came closer to gods and spirits, which made them suitable for burials and sacrifices (Ramsar Convention Secretariat, 2001a).

The most important factor that attracted people to wetlands, though, was that they were both suppliers of fresh water and could fulfil most human dietary needs. Wetlands, likened to ‘the kidneys of the landscape’ (Macaskill, 2009), were providers of the clean water which was essential for people’s health. In addition, all sorts of plants, fish and game were abundant as wetlands offered fertile, organic-rich, moist soils for vegetation and attracted fauna that came to quench their thirst. During the Neolithic Age, when people ceased being nomads and started to build settlements and to domesticate animals, wetlands became even more appealing, as they could be used for irrigation and for grazing lands which are five times more nutritious per unit area than terrestrial grasslands (ibid.).

![Fig. 4.1 Traditional dried bleak in Brajcino village, Prespa Lakes, FYR of Macedonia.](image)

**The wetland food chain**

Why are wetlands such excellent food providers? The factor that differentiates them from other types of ecosystem is the presence of large quantities of water that create favourable conditions for a large variety of species. Wetland ecosystems embody a ‘wetland food chain’. They provide an abundance of plants which are primary producers and form the basis for the food chain. Plants are eaten by herbivores (mice, rabbits, deer, some insects, fish, ducks and other waterfowl) who constitute the primary consumers. The primary consumers are eaten by secondary consumers (birds of prey, snakes, foxes, fish, wild cats etc), and the secondary consumers are eaten in turn by tertiary consumers-predators including turkey vultures, crabs and people (Kalman, 2007).
Of course, people are also part of the wetland food chain. Wetland products such as fish and shellfish support many local economies. In addition, other animals such as deer and waterfowl, which subsequently constitute a source of food and income for people, make use of wetlands for habitat and food.

**Healthy wetlands – healthy food**

Healthy wetlands provide healthy food for people and all the creatures that live on and around them. The quality of coastal and inland waters must, for that reason, be safeguarded. Globally, more than a billion people, most of them in developing countries, consume fish on a regular basis because they depend on fish for the majority of their animal protein needs (Ramsar Convention Secretariat, 2008). While a reduced availability of fish may sound alarming enough to westerners, poorer populations are directly threatened by malnutrition caused by a diminished protein intake, which is further compounded by increased susceptibility to disease.

Some 62% of the fish we eat comes from capture fisheries and 38% from aquaculture (ibid.). The principles of sustainability must be applied, as three quarters of the commercially important marine and inland fish-stocks that provide the food on our plates are over-fished. For its part, aquaculture, if not practised soundly, can cause pollution, habitat destruction and the escape of non-native species into the wild.

**Traditional food resources**

The food resources in Mediterranean wetlands have always been important. Plants, animals, soil and water have been used to fulfil fundamental human needs around the Mediterranean basin for thousands of years. Wetlands have provided fish, game, fodder and other resources. People have used these resources to survive and, later on, to obtain economic benefits by trading these products (Zalidis et al., 1999). They developed several methods, tools and techniques associated with food that allowed them to take full advantage of the wealth these places can offer.
Game
Archaeological evidence including elephant bones from the Torralba marshes in Spain and long wooden spears unearthed in Schöningen, Germany, confirm that our remote ancestors were already hunting in wetlands in the Early Palaeolithic era (Ramsar Convention Secretariat, 2001b). Neolithic finds around the Mediterranean Basin testify to the hunting of birds: wild ducks, white-tailed eagles (*Haliaeetus albicilla*), peregrine falcons (*Falco peregrinus*), tawny owls (*Strix aluco*), partridges, turtle doves (*Streptopelia turtur*) and pigeons.

Hunting has been an important activity in every major civilisation around the Basin throughout history. The Egyptians had a great respect for the animals they hunted, and would pray to the images of the god and goddess of the animals they hunted to guarantee their safety and the success of the chase. Hunters had a vast knowledge of animal habits, diseases and diets, and were very successful as a result. The ancient Greeks hugely appreciated delicacies such as pheasant, quail, wild guinea fowl and all kinds of small birds, as well as seagulls and pelicans. They even consumed various nocturnal birds, which they cooked with herbs, including some owl species but not the little owl (*Athene noctua*) associated with the goddess Athena—to avoid possible mistakes, hunting at night was therefore forbidden in the Athenian territory (Toussaint-Samat, 1992). In Roman times, hunting was considered a sport. Game birds were eaten only by the privileged, while in the countryside only land owners and freemen were allowed to hunt. Slaves were forbidden from the activity and were sometimes executed for defying this rule. The Gauls enjoyed natural game reserves in their magnificent forests and also hunted in the marshes and in adjoining rivers, where passing migratory birds (geese, ducks and cranes) were abundant (ibid.).

Fish
Fish bones and shells found during archaeological excavations also testify to the importance of fishing to people’s diet. In the Cosquer cave in Southern France, cave paintings from over 16 000 years ago have been found, some with drawings of seals that seem to have been harpooned (Clottes et al., 1996). Ancient Egyptians by the River Nile invented several fishing techniques and tools which are illustrated in tombs, drawings and papyrus documents. An ancient Greek wine cup from 500 BC depicts a boy crouching on a rock with a fishing rod in his right hand and a basket in his left. Romans are depicted in mosaics which show them fishing from boats with both rod and line and nets. Thousands of years of fishing practices have resulted in an immense cultural wealth of traditional techniques and equipment used for the exploitation of this resource; having been passed down from generation to generation, this cultural repository merits protection.

Rice
Wetlands have provided fertile arable ground since the Neolithic era, when people first settled and cultivated land. Of the many crops that flourished around them, the
most characteristic was rice, a crop which requires large quantities of water. Rice has been produced in the Mediterranean area since Roman times, but became a staple food mainly after the Arab invasion. The seven thousand varieties of rice can be grouped into three categories: short, medium and long-grain rice. Rice provides 20% of the world’s dietary energy needs (WWT, 2008) and forms the staple diet for 3 billion people globally (Ramsar Convention Secretariat, 2001b). Rice is also used to make flours, starches and thickenings, as well as having industrial uses in, inter alia, cosmetics, paper and plastics. It has been considered a gift from heaven, demonstrating that the gods care for mankind. The multitude of its grains symbolises fertility and abundance, so handfuls are thrown at weddings, an ancient custom originating in the East which is now widespread in the western world, as well. Two of the most important rice cultivation areas in the Mediterranean are the Camargue in southern France, and the Albufera de Valencia in eastern Spain (Toussaint-Samat, 1992).

Rice-growing as practised in the past was generally environmentally sustainable, giving mutual benefits to humans and nature. People shaped the environment around wetlands in a way that allowed them to harvest what they needed for their sustenance and small-scale trade.

**Traditional wetland products**

The cultural heritage of all the great civilisations that flourished in the Mediterranean region—including its culinary heritage—is incredibly rich. People living near wetlands have created and developed a number of characteristic traditional delicacies that are prepared using methods handed down from generation to generation, and which enrich the cultural heritage of each region. Examples include smoked eel and bottarga from Orbetello Lagoon in Italy (Lenzi, this volume, p. 172), paella from Albufera de Valencia in Spain, fish-roe from Messolongi Lagoons (Syratos, this volume, p. 182) and Prespa beans from Greece (Malacou, this volume, p. 329).

**Recipes using traditional wetland products**

<table>
<thead>
<tr>
<th>Traditional paella from Valencia¹</th>
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<tr>
<td>When the Moors conquered much of Spain one thousand years ago, rice cultivation was introduced into the Albufera de Valencia. The Moors also introduced the technology that went with it: irrigation channels, sluice gates, dikes and irrigation wheels, all of which are still in use today. Paella was a peasant dish cooked over an open fire in the fields and eaten directly from the pan using wooden spoons. Seafood is not easily found in the Valencia area, so the impression that seafood is used in the traditional paella recipe is incorrect. Instead, chicken, rabbit, duck and snails were used, with snails the most common of all</td>
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proteins. For special occasions rabbit or duck would be added, with wealthier people using chicken.

**Ingredients (serves 6)**

- 1 medium-sized chicken
- 1 medium-sized rabbit
- 2 medium-sized ripe tomatoes, chopped
- 165 g broad green beans (bachoqueta)
- 130 g large white Lima beans (preferably ‘garrofón’ – Valencian white beans)
- 1 level teaspoon of saffron
- 3 cups of medium-short-grained rice (preferably Spanish rice, or alternatively Italian Arborio)
- 8 cups of hot water or chicken broth
- olive oil (enough to cover the bottom of the paella pan)
- salt (to taste)
- 1 tsp of sweet red paprika

Heat the oil. Add the rabbit and chicken (lightly salted) when it is quite hot, and cook until golden. Add the white and green beans and, while they are being cooked, scoop a hole in the middle of the paella pan and cook the chopped tomatoes there. Add the paprika, stirring quickly, and immediately add the hot water or broth, which should almost reach the top of the paella pan.

Cook all the ingredients for about 20 minutes over a fire and taste for salt. Add the rice, distributing it evenly and make sure it is covered with liquid. The fire should be fairly high, maintaining the boil. Cook for 20 minutes and do not stir the rice once added to the pan, just change its position frequently to distribute the heat evenly. The broth should be absorbed when cooking is finished. Take the paella off the fire and let it stand for about 10 minutes, covering the top of the pan with a napkin. Decorate the pan border with small wedges of lemon and add branches of romero (aromatic herbs) in the centre.

**Fig. 4.3** Paella being cooked over an open fire.
Roast Prespa beans

The broader Prespa Lakes area is well-known for the cultivation of many varieties of beans. Climatic conditions and soil composition add a unique taste to the beans, which carry a P.D.O. (Protected Designations of Origins) label. This is a typical traditional recipe which uses Prespa elephant beans.

Ingredients (serves 6)
500 g Prespa elephant beans
2 carrots (cut into rounds)
1 large onion (sliced)
1-2 red peppers (chopped)
2 garlic cloves
2-3 tomatoes or tomato paste
parsley
mint
1 tsp salt
3/4 cup olive oil

Soak the beans overnight. Wash them and boil them for 5 minutes. Drain them and put them in a cooking pot, adding 5-6 cups of boiling water. Add the carrots and cook them on a low heat until tender. In another pot, cook the onion until golden-brown in 3-4 tablespoons of oil, and add the peppers, garlic, tomatoes, parsley, salt and mint. Drain the beans and carrots, put them in a pan and add the tomato sauce and the rest of the oil. Bake for 30-40 minutes at 180-200°C.

Fig. 4.4 Traditional baked Prespa beans.

Couscous with octopus

This is a very typical recipe of the Kerkenna Isles in southern Tunisia. The Kerkenna archipelago is a marine-coastal wetland characterised by very shallow waters, typical traditional fishing practices and an abundance of octopus. The most famous local speciality is a couscous with octopus dish unique in all North Africa.

Ingredients (serves 8)
2 kg octopus
2 medium white onions
4 tomatoes
4 green papers
6 cloves of garlic
200 g tomato puree
1 tbsp curry powder
1 tsp salt
1 tbsp chilli powder
500 g carrots (sliced)
1 kg potatoes (in chunks)
500 g green beans
200 g pumpkin (in chunks)
25 ml olive oil
1 kg couscous

Clean the octopus and boil for 10 min. Heat the olive oil in a separate pot and add the octopus, onions, tomatoes, green papers, crushed garlic, tomato puree, salt, chilli powder and the spices and leave to cook over a medium heat for 30 min. Add the carrots, potatoes, green beans and pumpkin.

Wash the couscous and put it in a steaming basket on top of the pot. Leave to cook for 35 min. Mix the sauce with the couscous and serve.

Wetland food products and sustainable local economies

‘In the age of tourism, place has become a consumer commodity and food a major part of the anticipations of pleasure that the traveller brings to a new country’ (Urry, 2002).

But this has not always been the case; two hundred years ago, regional cuisines did not enjoy much respect; instead, they were considered poor and uninviting.

3 Personal communication, Nejib Benessaiah.
(Téchoueyres, 2001). Additionally, as a result of industrialisation, artisan producers were threatened and their traditional techniques were abandoned (Barcelona Field Studies, 2009). In early twentieth century, this trend started to reverse. Rural space became equivalent to health, local place was considered heritage, and local traditions began to be promoted.

Later in the century, cultural tourism started to flourish. Many travellers were progressively interested in delving into a region’s culture and learning about the local way of life, history, customs and traditions to satisfy their cultural needs (Ritchards, 1996). Among the things cultural tourists pursue are a well-being lifestyle, authenticity, environmental protection, gastronomy and enjoying a high-quality experience. Foods incorporate characteristic elements of the tradition and culture of a region, and cultural tourists look for a cuisine that places emphasis on the heritage of a place (Barcelona Field Studies, 2009). Consuming local foods is like taking in a soupçon of the identity of a place (Téchoueyres, 2001).

In more recent years, cooking and local cuisines have been broadly advertised in the media. Food programmes, TV channels and magazines promote homemade cooking and good quality food. The ‘celebrity chefs’ beloved by the public support the use of local products and praise regional cuisines.

These changes in mentality and people’s newly developed social needs can benefit the local economies of the Mediterranean. In a place where so many great civilisations interacted over time, the resulting gastronomy is unique and considered one of the most balanced, nutritious and healthy diets in the world. As part of its cultural heritage, the culinary heritage of each region offers an opportunity for visitors to explore it in pleasant and interactive ways.

There are a great variety of wetland products: seafood, game, dairy products from animals grazing in wet meadows, rice, fresh fruits and vegetables, legumes... the list is nearly endless. Wetland visitors are presented with many opportunities to taste these products and take some of them back home. Traditional drinks and sweets, fish and game products, legumes and cheese are often sold locally near wetlands. Tavernas and traditional restaurants can be also found in considerable numbers around wetlands, where visitors can savour the tastes of the region.

These economic activities, which usually have a low environmental impact, can support local economies in an efficient way, especially if they are successfully integrated into local ecotourism initiatives. It is generally agreed that cultural tourists spend much more on average than standard tourists (Gunlu et al., 2008). High-quality wetland products, if promoted wisely, can find their place in international markets and stand out from other mass-produced commodities (as in the case of Fleur du Sel de Camargue).

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4 For example, each time a popular TV food show was broadcast, an extra 1.3 million eggs were sold in Britain.
5 Barcelona Field Studies Centre, 2009.
The importance of food in culture

All animals eat, but only humans cook (Fox, 2009). Food, therefore, is part of what differentiates people from animals, and it satisfies more than people’s need to survive. It is deeply embedded in the culture of each society, and interrelated with its history, geography, language, religions and art.

The study of history reveals dietary habits of the past, and teaches us about rural revolutions and the way people fought to obtain food (the Neolithic Revolution, the Muslim Agricultural Revolution and the British Agricultural Revolution). It is also a valuable source of information about past climatic conditions and how they have affected food supply.

Studying geography allows us to compare the dietary habits of different regions, dissimilarities between people of the South and those of the North, and the financial dependence of different societies on patterns of cultivation. Food also represents the identity of a people, a nation or a region. A typical example is the Mediterranean region and its diet, which encompasses more specifically characteristic cuisines (such as Italian, French and Lebanese).

Language discloses a large variety of connotations of food in all kinds of texts, in literary prose and in poetry.

Food is also linked to all world religions and spiritual traditions. There are foods which the faithful are not permitted to eat, periods of fasting (Ramadan, Lent), and food that is traditionally consumed during religious ceremonies.

Finally, food preparation has always been considered an art. Cooking, as mentioned above, became a mark of our humanity and our differentiation from other animals. Its ability to satisfy a very basic need, that of nutrition, combined with the ability to please, to entertain and to uplift body and the soul, has made food and its sharing a central feature of people’s lives.

Conclusions: food, society and culture

It has been said that throughout the course of human civilisation, food has been considered sacred because it feeds and sustains human beings and is produced by human labour, which is considered sacred in itself (Skouteri et al., 2005).

Satisfying more than hunger, food is central to a profound social urge. Food is usually shared: families eat together, larger groups of people celebrate by feasting together, sharing, distributing, giving, making food a focus of symbolic activity and altruism; a stranger is offered a plate of food; milk —the product of her own body— is the most important thing a mother can give her child, making food a symbol of love and security (Fox, 2008).
It is this symbolic quality of food that has served since ancient times as a means of communication between family members, members of a community and— at an even broader level—with Mother Earth (Machairopoulou, 2003). Feasts have always had one common element: the consumption of food. Food has also served as an excuse for a celebration to begin. It has constituted a symbol of prosperity and abundance, and has been present at the most important moments in the cycle of life, at baptisms, weddings and funerals. In this manner, the products of the Earth and of the creatures the Earth sustains symbolically connect humans and their culture with the world of nature.

References


4.2 Craftsmanship

Traditional activities in wetlands have resulted in the construction of a large variety of artefacts and in the development of sophisticated craftsmanship. Nowhere is this more evident than in the construction of the traditional boats that are still in use in a few Mediterranean wetlands, especially in developing countries.

These artefacts are closely related to forms of local knowledge, such as fishing methods and practices. The abandonment of these practices –usually for economic and social reasons– has made the corresponding artefacts redundant and their production in many wetland sites has stopped, resulting in the seemingly irreversible loss of valuable knowledge and craftsmanship.

The situation is not entirely lost, however, as public interest in wetlands may maintain such artefacts in use. Thus, traditional boats are being used for guided visits to certain wetlands or for sports events. Neretva Delta in Croatia is the site of one such example, where rowing contests are organised (Ladje Marathon, and ladje, traditional wooden boats, are used in eco-tourist boat trips to the Delta (Fig. 4.6).

![ladja](image_url)

Fig. 4.6 The ladja: a traditional boat.
Ramsar guidance

In this spirit, the Ramsar guidance on culture and wetlands attempts to protect the ‘mobile material heritage’ of wetlands, preferably by keeping it in use, which would also ensure the continued production of artefacts. If this proves impossible in a given situation, the related knowledge must at least be carefully recorded and documented, while physical remains should be preserved and presented in appropriate visitor centres and museums.

O.3.2.1b – To protect and preserve wetland-related artefacts (mobile material heritage)

The following actions may be required:

a) identify and compile inventories of wetland-related artefacts and tools of heritage significance used in wetland sites;
b) consider ways and means to maintain such artefacts and tools in use, if at all feasible, especially in the case of traditional boats;
c) develop projects to ensure that the know-how to produce and use such artefacts and tools is suitably recorded and maintained;
d) identify and apply appropriate incentives for the maintenance, use and production of such artefacts and tools;
e) collect ancient artefacts, restore and conserve them, and mount exhibitions in local museums or in wetland visitor centres; and
f) organise thematic museums, preferably close to wetland sites, if rich material of this kind is available.

The actions outlined above seem to cover the issues satisfactorily, but they require systematic implementation. In addition, higher education institutions should be encouraged to launch research projects and programmes on traditional activities in wetlands and on the artefacts used in them.
4.3 Traditional building construction

Reeds have had multiple uses in wetland areas, including as fodder and as a building material. The common reed (*Phragmites australis*) has been the most commonly used perennial flood-tolerant grass for this purpose. While building with reeds has been practised in many parts of the world, it is in the Iraqi marshes of Mesopotamia that some of the most brilliant examples of reed architecture are to be found, including large meeting halls, the *Mudhif*, assembled from bundles and mats of reeds (Thesiger, 1964; Young, 1977). Abandoned during the years of persecution of the Marsh Arabs by the Saddam Hussein regime, efforts are now being made to regenerate the technical knowledge and aesthetics of this traditional architecture.

The ancient method of thatching for the construction of roofs is still practised in traditional building construction. In fact, reeds for roofing are still exported from Mediterranean wetlands –especially from Turkey– to northern European countries that maintain buildings with thatched roofs. In the United Kingdom, for example, it is estimated that 4000 tonnes of reed are imported per year, as approximately 60 000 such buildings exist with roofs requiring yearly maintenance and replacement every 50-80 years. Once a sign of poverty, houses with thatched roofs are now preferred by prosperous and discerning home owners, in spite of the higher costs, including high fire insurance premiums.

![Fig. 4.7 Traditional thatched hut, Zaroshka, Albania.](image)

Reeds have also been used in traditional buildings around the Prespa Lakes. To protect this invaluable heritage, the Society for the Protection of Prespa has prepared a detailed design and construction manual to encourage local architects, builders and home-owners, though with only limited success to date.
Little progress has been made in using reeds and other wetland materials in modern building construction and as a means of heating and energy production; though developing techniques for using different kinds of straw bales offer some promise.

Another interesting recent development is ‘wetland roofs’, a system of green roofing invented in Germany\(^6\) which is based on mats of wetland plants which are watered daily to provide natural air-conditioning: during warm months, the heat in the spaces covered by the wetland roof is dissipated by the evaporation of the water on the roof. In winter, the wetland vegetation provides excellent insulation and protects the building from excessive heat loss. The aesthetic and biodiversity aspects of such roofs are evident.

The manufacturing of lightweight, high-insulation building panels from reeds has been considered, but has yet to be commercially exploited.

On the other hand, the transformation of reeds and other wetland perennial grasses into heating pellets, briquettes or cubes has been practised in many countries including Finland, Poland and the United States in both a commercial and a residential context. Reeds and other grasses have a thermal production equal to 95% of that typically given by wood, although they require special combustion equipment on account of their higher ash content and chlorine and potassium levels (Komulainen et al, 2008).

It is important to harvest reeds only during the winter months in order to avoid interfering with the nesting period for birds. Harvesting reed-beds is ecologically important –within certain limits– as it helps to maintain the extent of wet meadows, which are important breeding habitats for fishes and birds.

**Ramsar guidance**

Most of the aspects referred to above are covered in the Ramsar guidance (Ramsar Guidance, p. 50).

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\(^6\) See www.blumberg-engineers.de, checked 8 April 2011.
c) to study the technical and financial aspects of sustainably using wet-
land biomass as a fuel for heating or for the production of energy.

The advice given is sound, but it does not seem to have been implemented because it would require academic institutions covering various disciplines (including Archaeology, Architecture, Biology and Engineering) to collaborate more than they do at present with industry and commerce.

References


4.4 Tourism, leisure and sport

In most countries, wetlands have become a pole of attraction for visitors, whether they be local inhabitants, ecologists, tourists, schoolchildren or other interest groups. They usually arrive at a wetland entrance point—perhaps where a visitor centre has been established—and continue on foot, in 4-wheel drive vehicles or in boats; or sometimes on horseback, as in the Camargue.

As long as the ‘visitor flow’ is properly managed according to the carrying capacity of each area within the wetland (Papayannis, 2004) and zoning and transit regulations are respected, such field trips cause little damage and can have major benefits in terms of increased awareness and pleasure. This last aspect merits attention, as more and more visitors enter wetlands for their beauty and interest, and to enjoy the calm natural surroundings. This is a leisure activity that needs to be respected and taken into account in wetland management planning. Visitor centres play a crucial role in sensitising and educating people about the natural and cultural wealth of wetlands, and increasing public awareness of wetland-related issues. Increased public awareness, in turn, leads to public pressure for more effective protection and conservation of wetland sites.

There are other activities, however, that are of a more controversial character, including wetland sports. Some sports are respectful of the wetland surroundings and cause little damage or noise. Thus, as long as they adhere to the appropriate regulations, kayaking, sailing, underwater diving and rod and line fishing can be compatible with the principles of wetland wise use. Others, however, such as hunting and use of motor boats are more problematic and need to be carefully and strictly regulated in order to prevent degradation of wetland sites through noise, pollution and unsustainable harvesting.

It has been established that, over the last two decades, a considerable number of travellers choose ecotourism destinations over mainstream traditional tourist resorts7 because of a desire for original, high-quality experiences. In the vicinity of wetlands, sustainable ecotourism activities can be developed with the potential to boost local economies and create opportunities to build public awareness: small-scale tourist facilities, for example, that produce and serve traditional dishes using organic ingredients, involve guests in daily local activities and offer them the chance to experience additional aspects of the local wetland environment at first hand.

In every case, efforts must be made to balance the benefits to visitors with the needs of conservation. Incorporating cultural aspects in all these activities can increase visitors’ interest and pleasure and provide a fuller experience. Care must

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7 Ecotourism is reportedly growing three times faster than the tourism industry as a whole (Honey, 1998).
be taken, however, to ensure that the introduction of cultural heritage elements is done in an intelligent, informative and authentic manner and not in a simplistic ‘Disneyland’ fashion. The Sámi Eco-museum in Aanaar/Inari (Finland) provides a brilliant example of how this can be done.

**Ramsar guidance**

In view of the need to balance the benefits to visitors with wetland conservation needs, a new objective is proposed for the Ramsar Guidance concerning the management of sustainable visitor and tourist activities in wetlands (see Annex II, p. 411). This would be based on identifying the environmental impact of such activities, and relating this impact to the carrying capacity of the wetland sites concerned. Specific regulations should then be developed for each activity, including effective means of enforcement and payment for services provided. In addition, a communications campaign should be addressed to prospective visitors promoting both the natural and cultural values of wetlands, and sensitising them to the specificities of wetland sites and the need for appropriate behaviour.

The Head of Protected Areas for the Royal Society for the Conservation of Nature of Jordan, Ma’en Smadi, illustrates Jordan’s biodiversity and describes both the Society’s mission and the way in which the country’s remarkable protected areas system was established. This success story teaches us how community culture can be integrated into ecotourism activities that support local economies, protect local identities and empower community members while simultaneously promoting nature conservation goals.

In the next paper, Vanja Debevec-Gerjevič, an environmental education coordinator for the Škocjan Caves Regional Park in Slovenia, describes how biodiversity richness and cultural heritage complement each other in Mediterranean wetlands, and how this wealth can be successfully interpreted by visitors. Good interpretation requires knowledge of natural phenomena and of the values of the site, as well as involvement of the local people who are key stakeholders in conservation processes. Sustainable ecotourism should be promoted through management plans which support conservation of the environment and take account of the carrying capacity of each site.

**References**


Integration of cultural aspects in ecotourism programs in Jordanian protected areas

Ma‘en Smadi

Abstract

There is a new perspective in managing protected areas in general and protected wetland areas in particular which focuses on integrating the cultural values of the local communities living in and around wetlands areas with ecotourism activities. In this way, socio-economic development is combined with ecotourism programmes in protected areas that provide economic returns for local communities and can help ensure that true ecotourism initiatives are taken which can protect local cultures and empower local people while providing visitors with unique opportunities to learn about native communities while contributing to the local economy and local livelihoods. This paper provides a detailed description of the Jordanian experience in managing protected wetland areas; it includes the planning and designing of ecotourism and ecotourism activities and contains examples of ecotourism projects developed in Jordan.

Keywords: RSCN, ecotourism, protected areas, zoning plan, wetlands,

Country background

Jordan is a small country covering 90,000 square kilometres, of which more than 80% is classified as desert, and a population of 5.5 million. Its topography, geological structure and climatic regime are remarkably varied and have produced an equally disparate range of ecosystems ranging from evergreen oak forests to desert sand dunes.

Jordan is one of the three driest countries in the world. With increasing water use, virtually all marshes, rivers and lakes have disappeared in recent years, with impacts on nature and people. Wetlands are the most endangered ecosystems in Jordan, yet important in terms of biodiversity and livelihoods.

RSCN and conservation

The Royal Society for the Conservation of Nature (RSCN) is an independent NGO devoted to the conservation of Jordan’s natural resources. Established in 1966 on a not-for-profit basis under the patronage of His Majesty the late King Hussein of Jordan, the RSCN has been charged with protecting the nation’s natural heritage by the government of Jordan, making it one of very few voluntary organizations
to be given a public service mandate of this sort in the Middle East. Since its inauguration, the RSCN has achieved international recognition thanks to its groundbreaking conservation work.

The RSCN aims to integrate its biodiversity conservation programmes with socio-economic development, raising public awareness of the need to protect the natural environment, and gaining support for such protection in Jordan and neighbouring states.

The RSCN approaches its role by:
- establishing and managing protected areas to protect Jordan’s natural environment and biodiversity;
- conducting research to contribute to the scientific knowledge-base relating to conservation efforts;
- running captive breeding programmes to save endangered species from extinction;
- enforcing wildlife protection legalisation and policing illegal hunting;
- raising environmental awareness among schoolchildren by setting up nature conservation clubs, running education programmes in nature reserves and integrating biodiversity concepts into school curricula;
- promoting the socio-economic development of rural communities by creating jobs in ecotourism, craft production and other nature-based businesses;
- providing training and capacity building for environmental practitioners and other institutions in Jordan and throughout the Middle East;
- encouraging public participation in its activities by means of membership activities;
- promoting public action for environmental protection via campaigns and activities run by a committee consisting of volunteers from different sectors.

**Planning and design for ecotourism**

The zoning plan is one of the main tools the RSCN uses when planning ecotourism operations. The zoning plan identifies which parts of a given protected area can be open to visitors, and which can host facilities. These areas are demarcated in line with detailed ecological surveys marking the relative ecological value and sensitivity of the component parts of a protected area. Three types of zones are usually delineated: ‘wilderness’ or ‘core’ zones, where neither public access nor construction is permitted; ‘semi-intensive use’ zones, where limited access and small-scale facilities are permitted; and ‘intensive-use zones’, where greater access and construction are possible, though still tightly controlled. Daily access limits are set for the latter zones: the daily limit for the Rummana campsite in the popular Dana Biosphere Reserve, for example, is set at 60 people per day. Monitoring of the general impact indicates that this has not to date caused unacceptable damage to the area’s important habitats and landforms. As a rule, only a tiny
fraction of any given protected area can be visited; while visitors themselves are usually unaware of the restrictions, they ensure that wildlife can flourish undisturbed in the vast majority of the protected area.

Construction-wise, the lodges, campsites and other facilities in all RSCN protected areas are individually designed to reflect the popular architecture and cultural history of the locale, or aspects of the landscape. The unique character and atmosphere this imparts adds to the visitor experience. In Dana, for example, the campsite buildings mirror the shapes of nearby rock structures, while the Feynan Eco-Lodge is modelled after a caravanserai, and the Lodge in the Azraq wetland reserve incorporates military motifs by way of acknowledging its prior function as a military field hospital.

Environmentally-friendly design features are introduced wherever possible into our tourist facilities, although some were built in the early days of ‘green architecture’ when the appropriate technology may not have been available. Every structure reuses local building materials and features both high standards of insulation and solar-powered hot water systems. A more recent structure, the Feynan Eco-Lodge also boasts solar-powered electricity in its bathrooms and kitchens. Aware that there is still a long way to go in a number of key areas including waste management and energy conservation, we are currently developing still more stringent standards.

Ecotourism activity development: RSCN principles

– Ideas for new activities should be achievable, realistic and not impact negatively on the area.
– The new activity has to be compatible with the main goals and objectives of the reserve and respect the culture and traditions of the local community.
– Approval for the new activity should be sought from the local community, which should be involved in every stage of the design process.
– The planned activity should match the local landscape and topography.
– The planned activity should be safe for both visitors and staff.
– The planned activity should generate profits for the local community, the organisation implementing it and any tourism companies involved.

‘Wild Jordan’ is the commercial branch of the RSCN, which considers it a major tool for supporting conservation in these areas. Responsible for developing ecotourism in RSCN protected areas, it operates in line with principles enshrined in the International Ecotourism Society (TIES) definition of ecotourism:

‘Responsible travel to natural areas that conserves the environment and improves the well-being of the local people’.

More specifically, ecotourism initiatives and facilities in protected areas impact positively on nature conservation by creating:
– jobs and revenue for local communities. This increases local support for conservation and provides alternatives to ‘harmful’ land uses like inappropriate grazing and hunting;
– a substantial income for investment in the protection of biodiversity;
– additional support from decision-makers and the general populace by rendering tangible the social and economic values of nature conservation.

Ecotourism projects to date

Ecotourism facilities and activities have been set up in four Jordanian protected areas to date: Azraq, Mujib, Ajloun and Dana, the first two of which are wetlands. The four areas feature a wide range of habitats and landscapes, from rugged mountains to Mediterranean forests and desert oases.

The Azraq Wetland Reserve lies in an oasis famous for migrating birds in the Eastern Desert. In 1977, the Azraq Wetland and its adjacent (Qa Al Azraq) mud-flat were declared a major station for migratory birds on the African-Eurasian flyway under the Ramsar Convention. The Jordanian Royal Society for the Conservation of Nature (RSCN) subsequently declared the Azraq Wetland a reserve of national and international importance.

The Azraq Wetland Reserve is home to one of the most unique habitats in the world. Although it is located amidst desert in the Saharo-Arabian bio-geographic region, it contains a variety of habitats and microhabitats that are only to be found in wetland environments (Azraq Wetland Reserve Management Plan, 1998). The Azraq Wetland Reserve contains five major sub-ecosystems; the lake with its fresh water, the marshes with their moderately saline water and soil, the seasonal stream water, the silt dunes with their arid and highly saline soils, and the mudflats (Qa) with their highly saline water and soil.

Fig. 4.8 Azraq Wetland Reserve.
In 1994, the Jordanian RSCN initiated a project funded by the Global Environment Facility (GEF) and United Nation Developing Program (UNDP) to restore part of the wetland which successfully rehabilitated 5% of the former habitat. Subsequently, the reserve has received about 1.5 MCM/yr from pumping wells maintained by the Ministry of Water.

In 2000, artificial pools were constructed to breed Aphanius sirhani, an endemic species, as part of a program aimed at its conservation. The fish were released back into the wild in 2002, and the artificial pools were replaced by natural pool in 2004, with the fish being released from the new pools in February 2006.

In 2004, a second rehabilitation and restoration program began which sought to return the wet habitats to 10% of their former habitats. The first phase of the new program had been completed by the end of 2005. The second phase, which seeks to expand the restoration work to the all five Azraq Wetland Reserve habitats, began early in 2006.

A unique lodge created in a nearby renovated British Field Hospital from the 1940s offers a comfortable and unusual base from which to explore the wetlands and the Eastern Desert.

In addition, the RSCN has developed hiking and biking trails around the lodge and the wetland reserve which serve to connect the reserve and the lodge with the surrounding community and cultural sites, and to enrich the visitor experience.

The RSCN collaborated with Wetlands International in attempting to maintain the Mujib River, one of the last permanent rivers in Jordan, and to show that water use and pollution can be reduced without impacting on the local economy.

The Mujib River has a unique biodiversity which includes a fish species that only occurs in this river. Its waters are also crucial for the Mujib Nature Reserve which lies downstream on the Dead Sea.
River trails have been developed in the reserve which take the visitor through deep red sandstone gorges lined with palm trees and —with the aid of ropes— down high waterfalls. A ‘chalet village’ was opened in 2008 on the shores of the Dead Sea, which offers overnight accommodation with spectacular sea views.

The Dana Biosphere Reserve is the most developed in terms of its tourist facilities, boasting a guesthouse, campsite and eco-lodge along with a range of trails and tour programmes. Although many visitors come simply to enjoy the dramatic mountain scenery and to experience local culture, hiking is the main activity in Dana.

The Ajloun Forest Reserve offers a complete contrast; set among tranquil wooded hills in the north of Jordan, the reserve offers the visitor a choice of a tented lodge or individual cabin. A range of trails and tours has been developed which allow visitors to visit important archaeological sites and experience local village culture.

Protected areas and people

Balancing the interests of conservation with the interests of local people is not easy. Over the years, the RSCN has developed a careful stepped approach to resolving potential conflicts when a new protected area is planned:

Firstly, conduct a thorough socio-economic survey of the communities living in and around the proposed protected area. The survey should identify how the communities function, what their livelihood is based on, and what their relationship is with the site. The extent to which they depend on the site’s natural resources for their living is critical, and allows target groups to be identified: for example, new socio-economic initiatives will prioritise people who are highly dependent. The survey should also help to identify the communities’ resident skills and the potential for new sources of livelihood.

Secondly, relate the knowledge gained on community livelihoods to ecological information about the protected area (also gathered from extensive surveys). See if there are any significant associated threats to the ecological value of the area. The relationship is usually clear; the most common issues faced are excessive grazing by goats, hunting, fuel collection and the expansion of agriculture.

Thirdly, bring key stakeholders together to discuss the establishing of the protected area and to explore all the main concerns and issues. Local activists and decision-makers usually emerge from these meetings who can act as focal points for ongoing discussions and participation. Steering groups can also be formed to guide and support the setting up of the protected area, and to help resolve resource management issues.

Fourthly, begin work developing ideas for ‘fast-track projects’ with the target groups identified in step one. Such projects often include handicraft or tour-
ism ventures that can be up and running relatively quickly and bring immediate financial benefits. Look into sources of funding, and develop craft workshops or tourism facilities with the support of external experts and the ‘Wild Jordan’ team.

All the data and experience gathered during the above process can subsequently be used to support the development of a management plan setting out the longer-term biodiversity conservation and socio-economic development. Finally, the zoning scheme—which can, for example, identify which economic activities can take place in which areas without damaging sensitive habitats or species—is a critical tool for negotiating compromises between competing interests during the planning process.

Incorporating community culture into ecotourism activities

The ecotourism operations run by the RSCN seek to incorporate community culture by the following:

i. Combining recreation, traditional culture and responsible tourism.

ii. Only employing local community members in the protected areas who:
- know the area and its features;
- provide a knowledgeable interface with their community;
- stand to benefit financially from the eco-tourism operations.

iii. Exploiting a site’s tourism potential based on the RSCN zoning plan draw up to avoid the existing sites and areas used by the community and heavily visited sites in the core area; ensuring all the facilities are confined to the used areas.

iv. Ensuring that infrastructure is designed to fit harmoniously into the landscape.

v. Respecting the community’s traditions in relation to dress, language, religious practices, music and attitudes to smoking and alcohol.

vi. Respecting cultural and traditional values in the design of ecotourism activities:

   When designing any ecotourism activity, the culture and traditions of the local people should be strongly represented, and the people who are responsible for designing and executing this activity should be aware of this requirement and should know how to implement it. Promoting cultural interests and traditional folklore can be done in many ways and in the course of different activities.

vii. Promoting traditional culture (including food, lifestyle and traditional activities).

viii. Using local products in the tourist facilities.

ix. Generating new sources of income by marketing the community’s products.
Ecotourism and cultural traditions

Public participation and local involvement are essential to the concept of ecotourism. Moreover, ecotourism should not only support local communities, it should also represent them appropriately.

Ecotourists are usually interested in experiencing the nature of the place they visit, along with its culture and traditions. They are not necessarily looking for the ‘ideal community’: simplicity, and people living in harmony with their environment and engaged in traditional practices as a matter of everyday routine are key attractions.

One of the most important ways of achieving this is ‘True Experience’ tourism, which involves taking ecotourists to local families’ homes to experience their way of life, to discuss their lifestyle, culture and traditions and to sample their food. In this way, visitors not only get a feeling for—and some understanding of—the local culture, they also experience it directly. Having become familiar with all of these aspects of life, visitors can begin to feel a part of this culture and to connect with its people.

Folk arts give visitors an opportunity to experience the ways in which the local community celebrates. Folk dancing, singing and music-making is a heritage passed down from generation to generation, and organised folk nights allow local people to convey these traditional manifestations of happiness to visiting audiences. Audiences can also participate in these local dances and songs, and experience one of the most direct modes of access into another culture.

There are many other ways of providing opportunities for contact with the culture and traditions of local communities, and this is one of the most important elements in developing ecotourism trends. Often, there may be a wise elder or chief who has valuable information about the history of the area, the people, the local culture and its traditions. Such a person may be considered a ‘living local archive’ for the village or the area, and may typically be an accomplished storyteller, taking his listeners back in history and helping them understand and respect the place they find themselves in.

People tend to enjoy such interactions: visitors look forward to cultural exchanges of this kind, while local communities are generally proud of their cultures and traditions, and pleased when outsiders take an interest in them.

These are the ways in which ecotourism in Jordan is being developed as a responsibly-managed and rich visitor experience with minimal negative impact on the indigenous identities of the local communities concerned.

Helping Jordan’s tourism industry

The ecotourism sites and operations being developed by Wild Jordan are making a significant contribution to the development of Jordan’s tourism industry. In
2007, over 40 000 people visited RSCN sites, and the revenue generated contributed over 45% of the annual conservation costs and supported hundreds of local jobs. While the number of participants in these ecotourism experiences is modest at present, their impact on Jordan’s tourism industry is significant and growing. Some 30 Jordanian tour operators are involved in promoting RSCN products, usually as ‘mixed’ tour programmes involving ecotourism sites and traditional historical sites, and are lengthening the average stay of visitors to Jordan (which currently stands at a low 4.2 days). Having observed the success of the RSCN’s enterprises, the private sector is developing new ecotourism facilities and operations in other parts of Jordan, including Wadi Rum, and these will undoubtedly expand the sector further. Taking a broader perspective, the principles the RSCN has applied to the development of ecotourism in sensitive ecosystems and landscapes are being channelled into government land-use policies and development strategies; as a result, two of the nation’s major regions now have embryonic master plans that place equal emphasis on the development of tourism and the protection of natural resources.

Conclusions

It is very important to plan ecotourism programmes in protected wetland areas very carefully, and to take into consideration both the cultural values of the wetlands and the economic benefits for the communities who live in and around them, and use and depend on its natural resources.

Proper management can ensure true ecotourism initiatives which can protect local cultures and empower local people while providing visitors with unique opportunities to learn about native communities while contributing to local economies and livelihoods. Moreover, the income from such initiatives can feed into the financial resources required to cover the costs of nature conservation.

Reference

Interpretation and ecotourism possibilities in Mediterranean wetland sites

Vanja Debevec-Gerjevič

Abstract

Protected areas are specially designated sites that are distinguished for their natural and cultural heritage, but also for their management authorities’ responsibility to protect and develop the sites in a sustainable way, and to manifest their commitment to both local communities and global society. Many Mediterranean wetlands feature significant biodiversity while also being sites of rich cultural heritage. Based on well-known legends and myths, it is clear that nature is powerfully present in the everyday life of the area, suggesting a common set of values. The modern age has brought about many developmental changes in the region, but people in many places have managed to preserve and promote their cultural heritage, investigating, inter alia, opportunities for nature- and culture-based tourism. Interpretation is a challenge for wetland managers, since it entails learning about natural phenomena and the values of the site, as well as learning from the experience of local people who can act as major stakeholders in conservation processes. Proper management plans should promote sustainable ecotourism, since these activities take both the environment and a site’s carrying capacity into account. Tourism of this sort provides profit, but also fertile ground for research studies into the application of sustainable development goals for all stakeholders.

Keywords: Cultural heritage, natural values, interpretation, ecotourism, Škocjan Caves

Nature uses the human imagination to lift her work of creation to even higher levels.

L. Pirandello

A protected site’s potential with regard to conservation aims

Included in the priorities set for governments around the world by international conventions to which they are a signatory is the establishment of protected areas. These areas fall into several categories, and are often designed as a means of moving societies onto a more environmentally sustainable model of development, in which resource utilisation does not exceed the environment’s capacity for self-renewal. The foundations for this have been laid in every area of human activity, including politics and education.
The problems of nature protection and conservation management largely relate to human activities, and one way of looking at these issues is to consider them in a ‘human ecology’ context (Wolanski, 1991).

With the aim of conserving and researching exceptional geomorphologic, geological and hydrological features, rare and endangered plant and animal species, paleontological and archaeological sites, ethnographical and architectural characteristics and cultural landscapes, and for the purpose of ensuring opportunities for suitable development, the National Assembly of the Republic of Slovenia, adopted the Škocjan Caves Regional Park Act on 1 October 1996 (Official Gazette of the Republic of Slovenia, No 57/96).

Due to their exceptional significance for cultural and natural heritage, the Škocjan Caves were added to the UNESCO list of natural and cultural World Heritage sites in 1986. In 1999, the Škocjan Caves were added to the Ramsar Convention List of Wetlands of International Importance as the first European site listed under the Convention’s guidelines for the designation of underground wetlands. In October 2004, the Škocjan Caves Park was included in the world network of MAB Biosphere Reserves as the Karst Biosphere Reserve in the context of UNESCO’s ‘Man and the Biosphere’ programme.

Many Mediterranean wetlands manifest an abundance of significant biodiversity, while also being sites of significant cultural heritage. Based on well-known legends and myths, it is clear that nature is powerfully present in the everyday life of the area, in ways which show values that were shared throughout the region. The modern era has brought about many developmental changes in the region, but people in many places have managed to preserve and promote their cultural heritage, investigating, inter alia, opportunities for nature- and culture-based tourism.

Nature conservation was considered a somewhat narrow discipline for a considerable part of its early history, and protected natural areas were regarded as something to be isolated from the world beyond them. A policy orientation of this sort can destroy an area it was meant to protect, because of economic, social and other pressures that build up on it from both within and outside the area.

This does not, of course, imply that there is no case for strictly protected areas such as reserves where human activities are tightly regulated. In so far as the aims of conservation and protection take a long-term perspective, conserved areas must be able to interact with the region around them. Only in this way can local populations contribute to the achievement of the conservation objective (Arico et al., 2002). The establishment of an active yet positive relationship between humans and nature in a protected area is a complex process which depends heavily on the actions of the people who live there. The process is influenced by numerous factors, among them the location’s past development opportunities,
social and economic conditions, demographic structure and levels of public awareness. People’s relationship with nature, their perceptions of space and their feelings of attachment to the location similarly influence their active involvement in nature protection and the realisation of conservation projects.

Interpretation as a challenge for local people and visitors

Managing wetlands in ways which take into account development perspectives, such as tourism, is fraught with a number of challenges. Mediterranean wetlands are characterised by their rich history which has resulted in an extraordinary cultural heritage. Human presence in protected areas has arisen, mainly as a result of successive individual decisions, and only rarely as a result of an approach that considers the full range of relevant social parameters. Regional economic development patterns pose challenges for people living and working in areas where nature conservation is also a priority. At the same time, however, public awareness of environmental issues is increasing. Concepts associated with nature and the environment form part of the expression of people’s cultural identity. These concepts are often a way of framing explanations of natural phenomena which help us understand and foresee issues of environmental change. This can be part of providing a stable basis for people’s sense of belonging to a given place, in relation to both its natural and cultural attributes. The quality of life that encompasses cultural values and this sense identity is a legitimate goal in the management of protected areas, but a challenging one.

Mediterranean wetlands are located in a region where the development of local economies, and tourism in particular, have already created some of the infra-
structure appropriate for managing visitor flow. Wetlands are also the focus of a number of related tools and approaches which have been developed by international conventions or under national legislation. In some cases, too, there is a potential for benefitting from local traditions and heritage.

Fig. 4.11 Celebrating International Biodiversity Day in the Nature Science Centrum of the Škocjan Caves Park, May 2010.

The most important tools for implementing these approaches are interpretation and education in wetland values. Interpretation enables visitors to experience the varied dimensions of a site more closely and with heightened curiosity. It is hard to transform a visit into a new and meaningful personal experience, but it is an attractive prospect to at least gain new insights, and to learn about a site’s interconnecting natural and cultural aspects and understand them more completely. The process can be an entertaining way of learning new things using all five senses as well as individual emotional responses.

When wetland tourism is promoted by those who are not personally involved in the area, there is a risk of the associated interpretation becoming a passive process. Through carefully designed stories relating to key aspects of the wetland, trained people can share their own experiences of the site, arousing the visitors’ attention and curiosity in a more engaged and engaging way. With the help of traditional knowledge, the interpreter can offer an experience that appeals to the emotions and the senses. Good interpretation can also reveal new insights and broader meanings, and doing this well requires an additional set of interpretation skills.

The relationship between humans and nature has varied from place to place and from period to period. The idea of controlling—and, supposedly, improving—the natural world has in some cases given way to a desire to reunite and co-operate with nature. Our concepts of nature and the environment include an expression
of ourselves and our cultural identities. These concepts are what equip people with explanations about natural phenomena and with an understanding that helps them plan and manage their surroundings in sustainable ways.

A one-sided view of protected areas focusing only on the limitation of activities in those areas and, perhaps, the economic benefits for local inhabitants, does not avail itself of the opportunities offered for researching sociological and biodiversity problems in tandem. By adopting a more interdisciplinary approach, scientific research could serve as the foundations for the establishment of a broader value system.

In protected area systems formed as a new spatial planning arrangement, a formal organisation is usually designated to act as a management authority and approved at the national level as a form of social institution. Social institutions are groups within which relationships are normatively arranged, with individuals having precisely defined roles within the group. Given this basis, members of the group can, with a degree of certainty, know what to expect from the other members in terms of behaviour and functioning, and can rely on both to support their own operation in the institution (Flere, 2001).

This is particularly evident in regard to contact with members of the community who, though they do not live in the protected area, do interact with those that do. If the local inhabitants are informally allotted a special status as a social group associated with the protected area, this could bestow on them a degree of solidarity, cohesion and mutual help which may enhance their lives as individuals (Flere, 2001).

The successful functioning of a protected area usually depends on a constant human presence which no longer functions in a dominating and negative way, but operates in a new kind of symbiosis with the life of the place. The valuing of cul-
tural and natural heritage as key components of human existence can be developed through education, public awareness-oriented actions designed to protect biodiversity, and the conservation of those natural resources which maintain life.

The enduring presence of people in a place contributes significantly to raising awareness of the importance of conserving its natural features, taking as a starting-point the fact that people who live in a given place for a long time tend to act to prevent changes that may threaten its values (Trstenjak, 1984).

Local people are often unlikely to take the initiative themselves and become involved in the landscape planning, decision-making and design processes for protected areas, and this may be an obstacle to the adequate integration of their interests into the management of such areas. This further reinforces the need to look for practical ways of involving local communities in landscape planning, and the importance of taking into account the full range of qualities defining a space—not only its physical attributes, but also its associated human behaviours, activities and perceptions (Ward Thompson, 2002).

Ecotourism as a goal in protected areas development programmes

Ecotourism is an appropriate tool for protected area development programmes, since the aim is for visitors to experience a site in a way that contrasts with mass tourism tours. The knowledge passed on is crucial, as are the activities undertaken as part of the interpretation process. In order to be effective, ecotourism operators should have a strategy that defines the terms of reference for visits to specific places and takes into account their future development and the impact of visiting on the
local economy. Involving local people in interpretation allows local knowledge to be kept alive, and helps to foster acceptance of visits undertaken in a responsible manner. When local stakeholders are also engaged in the provision of services, a particularly positive outcome can result involving a ‘bio-social’ system that is capable of sustainably supporting itself. One other feature of ecotourism distinguishes it from other types of tourism: the fact that operators are under an obligation to contribute financially to research studies in the sites visited. The results of such studies can be important for raising local people’s awareness of a site’s potential, but they can also contribute to better interpretation planning. Good interpretation can help bridge the gap between scientific research and wider societal perspectives.

Tourism can often raise immediate income. Some constraints need to be applied in the case of ecotourism, however: In addition to environmentally sustainable transport and other facilities, the carrying capacity of sites to be visited should be studied and monitored. Studies should be undertaken to determine the physical, environmental and social-carrying capacity, which will enable managers not only to set a limit on the number of visitors, but also to evaluate developments and the outcomes of interpretation and ecotourism, and to define an acceptable range of tourist numbers. Such studies can also support evaluations of the effectiveness of the overall regime over time.

Given that natural and cultural heritage can generally only be preserved through proper human interventions, a number of relevant programmes have also been developed in the Škocjan Caves Park. Special education and train-
ing is offered to teachers, schoolchildren and visitors. After some preparation, including the provision of information on basic local knowledge, visitors and other stakeholders can take part in interactive workshops. All the activities are staged in the Park, where old houses have been reconstructed to house museum collections covering Ethnology, cave exploration, Archaeology, Geology and Biology. The museums are designed in a way that enables visitors to experience village life and the nature and culture of the sites, and to uncover its mysteries. Emphasis is placed on the need to protect natural values and to respect biological and cultural diversity, past traditions and local knowledge.

Fig. 4.15 Floods in the Škocjan Caves.

Apart from the activities in the Park that are strictly related to interpreting the site, education work is carried out with schools networks, and research and monitoring of the site is also undertaken. All the results are presented to the public in the form of posters, slide shows or exhibitions. This helps to bridge the gap between popular awareness and specialised science, and this approach is recommended as a way of adding interest to the experience of visitors, who perceive the site in a new way.

The management and protection of the Škocjan Caves Park is designed in such a way as to embrace the values associated with nature, cultural heritage and the life and work of local people. Evidence of interactions between these aspects during the Bronze and Iron ages can be found in the Mušja Jama cave. At the bottom of the entrance shaft to this cave, an extraordinary number of bronze and a few iron objects have been discovered. These are the remains of offerings and
religious rituals held at the surface above the Mušja Jama cave entrance. Some objects are regarded as being of Mediterranean origin (such as an iron sword typical of Greece in the tenth and ninth centuries BC), while many others have their origins in Pannonia. It is therefore posited that a sacred site existed above the cave at this time whose significance transcended the regional: the finds show that the site was of major significance in an area stretching from Central Europe to the central Mediterranean. Pilgrims from Greece and central Italy as well as the western Balkans and Pannonia travelled to the site.

To describe a site, or some of its observed aspects and phenomena, one should have a good story to tell as well as a skilful narrator. To really appreciate the site, people should feel its past and understand the historical processes and how life evolved there today. Finally, for people to visit the site again, they should take away memories that make them curious and anxious to explore it further. This can be done by successful interpretation processes involving conservation managers, local people, stakeholders and visitors, and by eco-tourism which enables a site to be developed as a tourist destination, but protects its natural values at the same time.

There are certain places in nature which, their history lost in time, embody powerful spiritual values that evoke feelings of astonished admiration in visitors. These sacred sites are valuable in many ways, since they link people and their beliefs with the natural environment and the cultural, social and economic values of the site. The onus of responsible for keeping these links strong and vivid is on the people who live there. By sharing their yard, their food and memories of the past, by respecting people and nature, they can create a sustainable way of life for future generations.

References
Flere, S. (2001), Sociologija, Maribor, Univerza v Mariboru, Pravna fakulteta.
4.5 Social practices and methods

In the distant past, human beings came to realise that they could achieve much more when organised into groups than they could when acting alone; they could help to defend each other from hostile tribes, animals and natural phenomena, they could team up to look for food more easily, and they could kill prey larger than themselves.

Over the years, societies developed intricate mechanisms regulating every aspect of communal life. Just as individuals in a population are driven to follow the strategies that will best ensure their survival, so too at the societal level are structures and processes selected with the aim of favouring a society’s continuation – or change when needed. Social imperatives can exert enormous power on the individual and they may be passed down from generation to generation through interactions within families, during education and through social contact with other members of a society. Rules and institutions typically permeate the organisation of a society. Institutions are defined as the rules and norms that structure human interaction, including their enforcement and penalties (North, 1990).

‘Practices’ is a term broadly used in the social sciences to describe anything people do (Ortner, 1984). ‘Social practices’ are the customs and traditions that form the ‘building blocks of society’ (Tuomela, 2005), and they regulate a society’s maintenance and development, ultimately determining its ability to survive.

Especially in harsh natural environments and/or where resources are scarce, societies must come up with collective ways of overcoming difficulties. One mechanism for ensuring adherence to these, especially prevalent in traditional societies, is the taboo. Taboos may concern rationing certain foods that are in short supply, safeguarding habitats in need of recovery and promoting certain production methods that either protect specific environments or provide equal access for all society members to a resource. Taboos can be imposed by a chief or others in authority, and can be very powerful in nature (Colding and Folke, 2001).

Taboos, especially those relating to food consumption, are also common in technologically developed societies. The reason western people will not eat dog meat, Jews and Muslims do not eat pork and Hindus respect cows may originate in economic considerations, based on the inability of specific ecosystems to sustain the consumption of these food categories or the central role of these species in human (economic) activities (Harris, 1987).

Another aspect of social methods and practices is the customary use of natural resources, such as the rules governing access rights to, and management of, water, for example in certain irrigation systems. There are rules in such systems gov-

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8 For example, dogs were necessary for hunting and in animal husbandry; horses were extremely valuable for the transportation of people and goods.
erning the amount of water each irrigator can use, the sequence in which fields must be irrigated, the contributions which those using the irrigation system must make in money or labour, and the penalties for misuse (e.g. theft or avoiding responsibilities) (Perreault, 2008).

The foggara irrigation system is a typical example of the customary uses of scarce water resources. Developed in North Africa, in the arid Maghreb, this is a method for harvesting the limited underground water using an ancient system of canals and wells. It is responsible for the continuing existence of a number of oases, such as the Tamentit Oasis in Algeria.

Canals are used to transport water over several kilometres, and require hard work during their manufacture and maintenance –labour which is shared among the community members. The distribution system is designed to satisfy community needs, and it can be said that the entire societal structure has evolved around this irrigation method which allows survival in the hard desert environment. Managed equitably by co-owners, and distributing responsibility among the most respected individuals of society, the foggara system permits the fair allocation of water by taking the needs of all local inhabitants into account. (Perennou, 2008).

References


4.6 Festivals, celebrations and events

Mobilising social groups in communal actions that benefit wetlands directly or indirectly can be a powerful force for conservation. In the Mediterranean, this includes festivals, celebrations and other events both large and small. Some are secular, while others have a religious character (see Section 5.3, p. 343). Some have been established in recent years, while others have older historical roots.

Some characteristic examples of secular events include the tarabuso festival in Orbetello (Italy), the annual photography festival in Ghar el Melh (Tunisia), and the boat races in the Neretva Delta (Croatia) (Papayannis, 2008).

Ramsar guidance

Because events of this kind can mobilise large numbers of highly diverse people, they can contribute significantly to an integrated approach to wetland conservation. The Ramsar Convention does not provide specific guidance on this, but the experience of Mediterranean sites indicates that this could usefully be included in the next revision of the Ramsar guidance document (see Annex II, p. 411).

The specific suggested actions start with an inventory of all the relevant events which are directly or indirectly related to wetlands. Suitable social partners should then be found to promote a conservation message in relation to both the natural and cultural heritage in a number of ways, including awareness-raising and activities (such as competitions and games) addressing different age groups.

Careful implementation of the planned activities is important, as is the objective assessment of the results obtained, so that any lessons can be learned and improvements if appropriate can be incorporated into subsequent occurrences of the event.

A case study from Albania

The Balkans is a region with a rich cultural and historical background and a diverse natural environment. In the next paper, Violeta Zuna, a project manager with UNDP Albania, describes the traditional festivities which take place every year in Narta Lagoon in the south-western part of the country, in particular the celebration of carnival. These festivities reflect the traditional socio-economic activities of the local community, and depict the people’s close links with the lagoon through various games, portrayals of fauna and flora, and the preparation and offering of food to the carnival participants.
Social events in Narta, Albania, and their links to environmental conservation

Violeta Zuna

Abstract
This paper provides some general information on Narta Lagoon, Albania, and its surroundings, and focuses on information concerning the social events held in this area and their impact on the environment. Narta Lagoon is situated on the southern bank of the Vjosa River where it flows into the Adriatic Sea. It includes important habitats with high ecological values. In addition, Narta and its surroundings are also rich in cultural heritage, and the region has abundant natural, historical and archaeological values. The site is also known for celebrations and events, of which the carnival is one of the most popular. This traditional event is an important activity which also plays an educational role, promoting the area’s values and supporting nature conservation objectives.

Keywords: Narta wetland, ecosystem, biodiversity, fauna, flora, species, habitats, cultural heritage, social events, carnivals

Introduction
Narta Lagoon is situated in the district of Vlora, which is one of the largest in Albania. It is located several kilometres north of the city of Vlora in south-western Albania. The lagoon is the second largest in the country.

Fig. 4.16 Narta Lagoon.

Narta is considered one of the most important lagoon areas in Albania in the light of its rich biodiversity and the range of habitats found there. These include the lagoon area, the Vjosa River delta, salt marshes, sand dunes, pine forests and the islet
of Zverenci. The interrelation among these various habitat types is of great ecological importance for the region. Studies of this area have demonstrated its floristic importance. Many of the plant and animal species are endemic to this coastal area.

![Fig. 4.17 and 4.18 Geographical position of Narta Lagoon.](image)

**Description of the site**

The Narta ecosystem is located on the south-eastern coast of the Adriatic Sea. The wetland complex covers an area of 19 412 hectares at an altitude which varies from 0 to 246 m above sea level. It comprises land from two communes: Qendra in the South and Novosela in the North. The nearest town is Vlora, one of the largest in Albania, with 106 000 inhabitants.

The lagoon is connected to the Adriatic Sea by a short canal. Narta Lagoon is named after the village of Narta, which lies on the lagoon’s southern shore.

The lagoon is bordered by the picturesque Zverenci hills. There are also two small islands on this side of the lagoon; the larger one, Zvërnec island, is home to the Zverenci Monastery.

Wetland habitats occupy 37% of the total surface area. Narta Lagoon has an open water area of nearly 41.8 sq km. Part of the lagoon, covering just under 13.8 sq km, is divided from the rest by a dike, and is used for salt production at the Skrofotina salt works. Several decades ago, the Narta salinas was one of the largest in the Balkans. The other main habitat (covering around 33% of the total area) is agricultural land. Forests comprise the third main habitat type, but cover just 6% of the area. The core is Narta Lagoon, a shallow marshland of 2 900 hectares surrounded by hills to the south and west, salinas and agriculture land to the north and two shallow wetlands (Kallënga and Limpoua) to the north-west.
Ecological characteristics

The Narta ecosystem is well-known for its ecological values. On 22 October 2004, the Albanian Government proclaimed the ‘Vjosa-Narta Landscape Protected Area (IUCN Category IV).

The wetland complex includes a variety of ecological units which differ according to the presence or absence of water, salinity and the physiognomy of the vegetation. These ecological units consist of numerous sub-habitats including semi-permanent wetlands, drainage and irrigation channels, marshes (salt-marshes and freshwater marshes), fresh water reservoirs and river plains covered by alluvial forests.

This special flora and diversity of habitats makes the Vjose-Narta wetland complex an important area. The plant diversity constitutes a significant national asset with economic and scientific values: some plants are extremely rare, others are of particular scientific importance, and a good number are of economic value as
medicinal, aromatic, industrial, nutritional or ornamental plants. Many of the species in the area are listed in the national Red Data Book for Albania.

The wetland complex also supports a large number of animals including insects, fish, amphibians, reptiles, mammals and —especially— birds. According to studies, at least 747 species of vertebrates occur here.

The site is an important wintering and breeding area for 192 species of birds, particularly waterbirds. Winter censuses undertaken between 1995 and 2004 recorded between 12 600 and 81 200 individual waterbirds, with an annual average of 34 800. The majority (91%) of the wintering birds do so on the waters of the lagoon, the most numerous being coots and various duck species. During the breeding season, Narta Lagoon becomes the nesting site for 630-830 pairs of waterbirds of several species, most of them (88%) concentrated in the Narta saltpans.

**Fig. 4.21** Number of wintering birds, 1995-2004.

Thirty-two of Albania’s 71 species of mammals have been recorded here. The most numerous are rodents, followed by bats and carnivorous species (Insectivora, Chiroptera, Rodentia, Lagomorpha, Carnivora/Fissipedia, Artiodactyla, Cetacea/Odontoceti and Pinnipedia).

**The socio-economic profile of the Narta area**

Narta is an attractive village 5 km from Vlora city. It was established in 1506, and now has around 23 000 inhabitants belonging to around 5688 families.

The local economy is agriculturally-oriented. Almost 80% of the families are involved in crop cultivation and stockbreeding. The most important economic activities are crop cultivation, stockbreeding, arboriculture, tourism and fishing. The majority of the population works in these sectors, with smaller numbers working in the construction sector in Vlora city or in other occupations. A limited number of families include people in state employment.
The village is a traditional producer of wine, olive oil and fish specialties. The inhabitants speak Albanian and Greek.

**Cultural aspects**

The cultural heritage of the Narta area includes features which are considered significant both locally and nationally.

The presence of natural monuments and archaeological sites gives the entire area additional significance in relation, too, to its ecotourism potential.

The Church of Saint Mary, a cultural monument dating from the thirteenth century, is situated in the centre of the picturesque island of Zvërnec in Narta Lagoon. The church is a 'cross with cupola' construction.

The remaining original parts of the church have been conserved, including a mural and a carved wooden altar decorated with flower and animal motifs. The narthex is paved with stone slabs, and in the northern part of the building the sunlight comes through seven arches built on stone columns. All these elements give the church an original character. The church has been restored and serves as an Orthodox place of worship. On August 15 each year, an Orthodox service takes place in honour of the Virgin Mary.

Triport lies in the western part of Vlora city, to the East of Narta lagoon, near Zverneci village. Archaeological excavations have shown that this site features ancient buildings dating from the Hellenistic period. The archaeological excavations have brought to light remnants of ancient constructions and an embankment stretching far out into the sea. In antiquity, before the first century AD but later, as well, Triport was an important harbour on the Adriatic connecting the cities of Aulona, Apollonia, Orikú, Amantia and others. Ancient ruins and other archaeological objects have been found underwater and on the coast.
Spinarica is a mediaeval city located near Narta Lagoon, which is first mentioned in written documents from the twelfth century. According to a number of written sources, Spinarica was one of the most important cities on the Adriatic in the Middle Ages, when it was a significant trading centre for cereals, salt, crops and livestock, as well as for its ornaments and other objects made from wood and iron; Venice, Puglia, and Ragusa all maintained consular representatives there. Spinarica declined in significance after the Ottoman occupation and disappeared from the chronicles in the fifteenth century. Many of its ruins remain unidentified due to natural changes in the landscape.

The ceremonial festival of Carnival

The annual Narta Carnival festival dates back to 1922 and lasts three days. The inhabitants of Narta participate in this event, along with people from the surrounding area and Vlora city. In contrast to similar carnivals in other countries, the Narta Carnival takes place at Easter, adding a religious dimension to the celebrations.

Although festivities of this kind were not allowed under the Hoxha regime, the local community tried to conserve and pass down the traditions, rituals and celebrations of the Eastern Orthodox Church, but also the tradition of carnival, from generation to generation. After the political changes of the early 1990s, the local inhabitants and communities revived these values and their associated practices.

Some typical elements of the three days of carnival include arts activities, folkloric celebrations and the wearing of festive costumes, in which both locals and members of neighbouring communities are invited to participate together. The activities include concerts given by schoolchildren from Narta village, a festival of Albanian gastronomy, games, tours and events designed to raise environmental public awareness.
A core festival group of around 80 people dress in traditional carnival clothes. Others wear masks and some imitate various endemic and traditional animals. Typical characters include xhika, a man dressed as a woman, and the harlequin dressed in colourful paper strips and a sack in place of the traditional kilt. According to tradition, the most notable of the animal roles is that of the bear (a person wearing a buffalo skin) accompanied by a Roma who pretends to beat it with a stick. During the entire ceremony, the crowds, accompanied by a folk band, go around the village streets performing for popular dances and games.

During the ceremony, an abundance of traditional homemade wine and food, particularly Easter eggs, are offered to the participants. Over the three days, the residents celebrate in their homes and families visit one another (occasionally celebrating other family ceremonies at the same time, such as weddings).

The rationale for the Narta carnival relates to the main traditional social-economic activities of the local community. The local people are well-known for their skills at fishing, fish cookery, horticulture, wine making and salt production. The most
important attribute of Narta village and the local population is Narta lagoon, which plays a very important role in the community. This becomes evident during the celebrations through various games, the portrayals of fauna and flora, the preparation of food and the offering of various fish products to participants in the carnival. These activities testify to the strong and ancient links between the Narta communities and the wetland ecosystem, the pride they feel in the natural, cultural and historical values of this lagoon and the joy it gives them, and the impact of environmental problems on their lives. All these are elements in the festive celebrations of Carnival: colours, folk songs and dancing, games, festive costumes and food.

Recently, the local authorities as well as other agencies and stakeholders have become increasingly interested in, and supportive of, such events, extending the festive dimensions of Carnival, promoting and restoring the natural values of the region, and incorporating traditional local folk and festive events into development plans for the area.

Besides their spiritual and festive qualities, the activities described above also play an important role in promoting some other of the area’s values and assets such as its ethnography, history and economy. This helps to reveal Narta’s traditional local customs, music, dress, games and food, all of which constitute assets for the sustainable development of the area. These activities also demonstrate the traditional links between the local community and the wetlands, and the important role these links play in nature conservation and environmental education.

References


Qirjo, M. (2002), Site Diagnosis of the MWC Sites, MWC project, UNDP, Ministry of Environment, Forestry and Water Administration.

Regional Environmental Center (1997), The Red Data Book, Tirana.


Bego, F. (2001), Te dhena te reja mbi Gjitarët (Mammalia) e vendit tone: statusi i njohjes, i per- hapjes gjeografike dhe statusi i ruajtjes dhe rezikimit te tyre, Studime Biologjike.

Qirjazi, P. and Bego, F. (1999), Natural Monuments of Albania, Ministry of Foreign Affairs of the Netherlands-Milieukontakt Ooast Europa.

Knowledge, belief systems and the arts

Knowledge has many aspects in a wetland context. Perhaps the most obvious relates to the management of wetland resources. As shown in Section 5.2 (p. 325), the Ramsar Guidance on maintaining and making good use of traditional knowledge related to wetlands suggests a number of appropriate actions. Contemporary knowledge on wetland management resulting from advances in science and field experience is also highly pertinent. Perhaps a combination of the two could provide the best results, while also enhancing the cultural aspects of wetland management.

There are other areas in which knowledge is important, although not always readily available. The most significant concerns the relationship between human beings and biodiversity. Studies on human habitation and activities, past and present, can provide historical information and data of relevance both to contemporary aspects and future projections. Similar studies may document the trends in biodiversity evolution in a given wetland site. The two aspects have to be correlated to allow causes and effects to be identified and documented. Such a correlation can be based on temporal and spatial parameters which can, in turn, provide input useful for the integrated management of cultural and natural heritage.

Thus, serious interdisciplinary work is necessary to produce valid and well-rounded knowledge which can then be disseminated through education in appropriate forms and at appropriate levels. In the case of wetlands, formal education provided by academic institutions must be complemented by the targeted training of decision-makers and site managers, and by the provision of popularised knowledge to the general public through, inter alia, wetland centres.

Knowledge is typically thought of as lying within a rational framework. It is complemented by belief systems, which can operate in different ways. Since antiquity, wetlands and water have been included in the belief systems of indigenous peoples, local communities and even mainstream religions, and this has given rise to concrete manifestations of respect, including major and recurring activities such as public celebrations, liturgies and pilgrimages.

Some of these activities are closely linked to traditional social practices with their roots in the recent or older history of local societies (See also Section 4.6,

< Fig 5.0 Wooden boats, Morocco.>
p. 295). Undoubtedly, all these spiritual and social activities strengthen the relationships between people and wetlands, and can thus contribute indirectly to their conservation.

By focusing on wetlands as a source of inspiration, art can play a complementary role in encouraging people to perceive and comprehend the diversity and beauty of water-related landscapes. In this way too, culture may have a direct and positive impact on conservation objectives.
5.1 Scientific research and education

Wetlands provide a highly interesting subject for scientific research, because of their physiographic and biological diversity and the interactions that take place within them between human activities and natural processes. Research into wetland ecosystems, functions and processes is extensive and widely disseminated. Properly presented, it can be a powerful source of knowledge for the managers of wetlands. It was with this goal in mind that the MedWet Initiative, in co-operation with the Tour du Valat Research Station, attempted during the 1990s to translate the latest scientific wetland research into more useable forms and to make it more available throughout the Mediterranean by means of a series of publications entitled ‘Conservation of Mediterranean Wetlands’1.

Similar scientific research has been carried out into the ethnological, social and financial aspects of wetlands within the human sciences. As noted already, what is still weak is the interface between the two, and especially the answer to the key double question: ‘How do human activities affect wetland biodiversity, and how do the natural values of wetlands benefit the human race?’ Integrated and multidisciplinary scientific work is necessary to chart this intricate and complex relationship. One promising method is the correlation of human activities and biodiversity evolution using dates and geographical co-ordinates as key parameters. If these could be charted in more detail (for example by making greater use of GIS systems) and more precisely correlated, richer patterns might emerge that could facilitate the more integrated management of the cultural and natural heritage of wetland sites.

The knowledge generated by such scientific work is useful not only for site management, but also in various forms and levels of education, from primary schools to post-doctoral courses, from raising the awareness of local inhabitants and visitors to the sensitisation of decision-makers and the training of responsible staff. Wetlands are thus field laboratories in which multiple and diverse knowledge can be developed and tested.

Ramsar Guidance

Beyond general recommendations on an integrated approach to wetland-related scientific work, the Ramsar Guidance identifies specific areas in which such work is limited at present and needs strengthening.

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1 Available in English and French, these volumes can be ordered directly from Tour du Valat (http://en.tourduvalat.org/documentation/commande_d_outils).
O.4.1b
To encourage research on palaeoenvironmental, palaeontological, anthropological and archaeological aspects of wetlands
(from guiding principle 10)

The following actions may be required:

a) promote thematic applied research, as well as archaeological fieldwork on specific sites, through systematic programmes of survey and excavation, on issues that may include
   - historic models of wetland exploitation, providing also useful lessons for future sustainable use;
   - effects of re-wetting on organic archaeological and palaeoenvironmental evidence, including issues of water quality;
   - history of the hydrology of cultural heritage sites;
   - development of new methods for rapid assessment of potential cultural content in cases of imminent threat;
   - preservation of archaeological remains in situ to analyse the changing burial environment of wetland sites; and
   - balancing educational and recreational access to wetlands with the need to protect their archaeological heritage;

b) develop rapid survey methods to assess wetland sites with high scientific potential in which efforts should be concentrated in a first phase;

c) use the results of such research for education and public awareness purposes, to enhance knowledge and appreciation of wetland values;

d) encourage specialist wetland groups to include cultural values in their programmes.

The implementation of this guidance will require the identification and encouragement of a broad array of academic and research organisations to carry out the requisite research. A limiting factor may be the insufficient funds available for this type of activity in the Mediterranean. Low-cost pilot projects may, however, convince donors to allocate priority to it by indicating that the results would contribute to improved wetlands management.

Integrated research would also contribute to a better understanding of wetland natural and cultural systems, and add additional momentum to related educational activities to which the Ramsar Guidance accords major importance, as indicated below:
O.4.1c
To improve wetland-related communication, education and public awareness (CEPA) in relation to the cultural aspects of wetlands
(from guiding principle 25)

Actions required may include the following:

a) sensitise teachers at the various levels of education, starting with schools in the vicinity of major wetland sites, about the cultural aspects of these sites;
b) develop educational and public awareness materials and training modules;
c) encourage the production and dissemination of videos and films on the cultural aspects of wetlands;
d) design and launch public awareness campaigns, addressed to local inhabitants, wetland visitors and wider publics, on the values and significance of the cultural aspects of wetlands and their potential recovery where they are being lost or abandoned;
e) incorporate the promotion of the cultural aspects of wetlands in national and local tourism campaigns, taking into account the particular sensitivities and the carrying capacity of each wetland in relation to the potential tourism activities;
f) use the mass media and wetland-related traditional festivals as means to disseminate information and foster appreciation of wetland cultural values.

The full implementation of this advice will require considerable effort and resources. Wetland visitor centres should play a key role, as indicated by the case of Sidi Boughaba in Morocco (this volume, p. 317) and the RSCN in Jordan (this volume, p. 275). In general, the active participation and assistance of concerned non-governmental organisations is of great importance in developing successful CEPA activities.

Case studies

The link between cultural and biological diversity is long-established and features strongly in the multitude of ways in which humans have interacted with the natural environment. Egypt, a cradle of civilisation, is a place where this relationship has been evident for thousands of years. Development is, however, now threatening the country’s archaeological resources, and aspects of its cultural heritage have been lost. Egypt’s biodiversity conservation strategy takes the preservation of cultural heritage into account. In his paper, Professor Moustafa
Fouda illustrates how wetland protected areas contribute to the safeguarding of this heritage.

The paper which follows illustrates various aspects of wetland research and education with reference to Sidi Boughaba, a coastal site in Morocco. A number of international and national institutions have joined forces to establish a National Centre of Environmental Education (CNEE) in the Sidi Boughaba Ramsar Site, taking advantage of the opportunities provided by environmental education to raise public awareness. An important biological reserve and a haven for waterbirds, which has been designated a national heritage area for both its history and its rich biodiversity, the site serves as an arena for education activities. Abdelhamid Belemlih, director of the Société Protectrice des Animaux et de la Nature (SPANA) of Morocco, which manages the site, describes the history of the site and provides a detailed account of its education programmes.
Managing the natural and cultural heritage of wetlands in Egypt

Moustafa M. Fouda

Abstract

This paper provides a brief definition of cultural heritage and its components, and explains the links between natural and cultural heritage. The natural environment has provided the physical and spiritual background for important civilisations, and hosts important cultural values which represent a significant legacy that has been handed down over the generations for millennia. A loss of cultural diversity can therefore contribute to a decline in biodiversity. The Egyptian civilisation is among the earliest and most important cultures in the world, and its traces are evident throughout the Egyptian territory. Development, nonetheless, has put a great number of archaeological resources at risk, especially those that are small and unstudied. Thus, cultural challenges in Egypt are bringing about a loss of cultural heritage. This paper focuses on the role of wetland protected areas in preserving cultural heritage. Egypt’s biodiversity conservation strategy and action plan includes preserving cultural heritage. Cultural indicators are used to shed light on cultural heritage status and trends.

Keywords: Egypt, cultural heritage, wetlands, cultural indicators

The Oxford English Dictionary defines culture\(^2\) in terms of the customs, civilisation and achievements of a particular time or people. Moreover, it can be said that culture is a set of ideas, attitudes and habits developed by people to help them in their conduct of life. In the Mediterranean, people developed such attitudes and habits over time. Culture has many manifestations: art, architecture, morals, laws, customs and beliefs.

Cultural heritage can be divided into two main components: material and intangible heritage, meaning cultural expressions through material signs and tokens such as artefacts, archaeological sites, cultural spaces and landscapes, on the one hand, and the intangible heritage of the knowledge passed from generation to generation since ancient times and including procedures, customs, uses and beliefs, rituals, music, popular medicine and dance, on the other.

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Natural and cultural heritage links

Natural resources have been the basis for human development since prehistoric times. Without biodiversity, there can be no cultural heritage. Nature has provided the physical and spiritual background for important civilisations. Cultural heritage is related to humans, and humans are part of the ecosystem. They have lived, built settlements and exploited –and even altered the state of– the natural resources around them for their benefit.

The natural environment hosts important cultural values which represent a significant legacy. This legacy has been handed down over many generations. Culture and biodiversity are intimately and inextricably linked (Posey, 1988). Biodiversity is represented in religions, languages, art and traditional knowledge. Cultural diversity has arisen in response to biodiversity, and the loss of cultural diversity can contribute to the loss of biodiversity. For many generations, people lived in harmony with the environment, but in recent years people have lost their identity in the sense that they have forgotten their traditions and ethics, with globalisation playing a significant role in this process.

Cultural challenges

Egypt has one of the richest cultural heritages in the world, spanning the entirety of human history. Archaeological sites of different periods, types and sizes are scattered throughout the entire Egyptian landscape. Unprecedented development pressures are now exposing many archaeological resources, particularly small and unstudied sites, to an increasing risk of loss and degradation.

Related to the loss of cultural identity and diversity is the critical issue of introducing new technologies, so that traditional values are maintained and enhanced instead of resulting in unsustainable practices such as overfishing and overgrazing. Such decisions must be based on societal needs. They should be accepted by society and reflect their actual needs, rather than the authorities’ perception of these needs in the decision-making centres. And that is why technology transfer is a very critical issue. Decision-making power –on what to adopt and what to reject– should go hand in hand with a sense of great responsibility.

Protected areas and cultural heritage in Egypt

When it comes to protected areas, the conservationists have an important role to play. Legislation and laws provide the tools to protect cultural sites along with natural ones. Cultural sites, particularly small and dispersed ones, should be safeguarded from degradation. In addition, cultural landscapes, as well as indigenous knowledge and traditions merit preservation.
According to the Durban Accord\(^3\), the role of protected areas (PAs) is to preserve both the cultural and spiritual values of sites—their archaeological and cultural heritage, as well as their special spiritual places and ceremonies related to them—and the indigenous peoples within PAs, encompassing their rights, the need for reaching consensus with locals and the right of indigenous people to participate fully in the management of PAs.

To date, 27 protected areas have been instituted which cover almost 15% of the entire Egyptian territory and represent a wide range of wetland, mountain and marine ecosystems, as well as most natural landscape types. The protected areas also include major archaeological sites, all of which are protected by law. These sites incorporate important elements of traditional cultures.

There are hundreds of different habitats in Egypt, and their classification presents many problems. The classification is based on the systematic approach, the geographic approach and the environmental management and conservation approach. Wetland classification has resulted in 12 generic types. Lakes Bardawil, Matrouh and Burullus are some of the most productive (in terms of fish caught) brackish ecosystems in the entire Mediterranean area (200,000 tonnes from one lake). Egypt has one of the longest coasts in the Mediterranean. Even in the middle of the desert, Egypt has a large number of oases which, through not large in size, manifest considerable diversity.

\(^3\) The Durban Accord, the V\(^{th}\) World Parks Congress (WPC), Durban, South Africa, 2003.
Wetlands are very important for water purification as well as protecting against sea surges, acting as biodiversity reservoirs and serving as sources of fish and other products. Moreover, they provide recreational and eco-tourism services and hydrological functions, contribute to climate change mitigation and offer educational and research opportunities. Laws for their protection are therefore necessary, and the appropriate authorities must implement them and at the same time ensure wetland protection. These laws include bills for environmental protection (Law 4/1994 amended in 2009), for protected areas (Law 102/1983), fisheries (Law 124/1983) and also include regional and international conventions.

Culture and folklore in Egypt

There are prehistoric sites in many localities in Egypt, even in remote parts of the desert, populated by large numbers of people (Hoffman, 1980). These communities still raise cattle, a fact that contradicts the arid environmental conditions. More than 20,000 years ago, however, these sites were completely different, with a rainfall of 400 ml per year, which is very high compared to contemporary levels of only 10-15 ml per year. When water becomes available, the vegetation attracts people who build settlements and organise their lives around these sites. Sumar Caves, where many important rock paintings were discovered, are a characteristic example. In arid environments, rain can create temporary wetlands in very short periods of time (2-3 days), and then vegetation grows surprisingly rapidly, altering the landscape.

Prehistoric, Pharaonic and Ptolemaic sites like Siwa and Qarun are also rich in cultural heritage. The most important sites are situated in protected areas. Not all of them are near wetlands. Some of them are situated in arid areas, but in the past water bodies existed nearby and abundant quantities of water were available. Many Roman sites, as well, were situated near wetlands, including Wadi El Gemal, Ashtum El Gamil, Siwa, Zaranik and Wadi El Gemal. The cultural heritage of all these sites is particularly important and extends into the modern era. This is more evident outside large urban centres like Cairo. Observing rural life, one can still view how, for example, camels are still in use, that people preserve traditional dances, use resources and make high quality handicrafts that have become fashionable. A characteristic fashion industry has been developed and promoted abroad via Egyptian embassies, and a fashion show was recently organised in Italy with great success. The local economy relies on the industry and revenues created by this activity.

Folklore is very important and must be documented. The values and knowledge it conveys (use of medicinal plants, traditional forms of architecture, customs, tools) may seem commonplace, but they reflect special tribal characteristics. The livelihoods of the locals are not complicated, but people live quite happily.
Conservation issues

To work in a professional way, a framework must exist. Strategies must be developed as well as a long-term vision to ensure that one is on the right track. Conservation must be achieved through capacity-building with wide public participation. Sustainable development –functioning as an umbrella and accepted by everyone– is a prerequisite if conservation strategies are to develop, and must be applied at a national and regional level.

Priorities and well-defined objectives must be set in order to create such a framework. The necessary strategies can be developed at a national level (especially when biodiversity is concerned) or can focus on wetlands. Managers should sit down with locals and experts and institute a clear mission and goals. Particularly when it comes to wetlands, socio-economic factors, as well as cultural and ecological values, must be taken into account and assistance should be sought to take full advantage of them.

To develop strategies and management plans, conservation managers have to have a clear idea of the key issues they are dealing with, such as fisheries, hunting, coastal development, tourism, habitat degradation and the exploitation of resources, and these issues must become part of their daily life. The manager must also assess his own abilities and investigate whether a set of criteria are met within his organisation. These involve: the availability of resources; whether the organisation is adequately staffed and its personnel skilled and trained; whether the appropriate tools are available, such as zoning and patrolling; whether there is a capacity for reviewing Environmental Impact Assessments; whether people can monitor sites, etc. If these conditions are not met, the manager should look for them outside the organisation.

Wetlands can be used as indicators. Indicators give a sense of trends and define the status of specific issues (Hassan et al., 2005). Various biodiversity indicators have been developed, but no cultural equivalents. Scientists are familiar with biodiversity indicators; they have tested them and worked very well with them. It is hoped that now is the time to develop cultural indicators based on the values of cultural heritage and to ensure that they become part of the recommended agenda of Protected Area managers.
It has become clear again and again that the problems relating to wetlands cannot be solved by wetland managers alone. Citizens must participate in conservation efforts and practices, and work together with conservationists. All development sectors should also be implicated to a large extent. Protected Area managers should contribute to the world ecosystem conservation efforts by providing knowledge derived from their experience in the field, and set targets.

References


WPC (2003), *The Durban Accord*, Vth World Parks Congress Durban, South Africa.
Environmental education in wetland sites: the case of the Centre National d’Éducation Environnementale de Sidi Boughaba, Morocco

Abdelhamid Belemlih

Abstract

Wetlands have multiple values but face many threats and are complex ecosystems. Interventions for their conservation are not easy to make and must involve multiple actors; environmental education plays a fundamental role in raising awareness and helping the parties involved to act in synergy. In order to contribute to this awareness, the wetland of Sidi Boughaba (SBG) is a good example of international institutions (the European Union, BirdLife International, the Society for the Protection of Animals Abroad ‘SPANA/UK’) and national ones (the Government of Morocco, the Société Protettrice des Animaux et de la Nature ‘SPANA/Maroc’) joining forces, in this case to create a National Centre of Environmental Education (CNEE) at the site. The site is classified as a national heritage area because of its history and its biodiversity richness, and is also included in the Ramsar list. It consists of a permanent biological reserve with a natural forest of red juniper and a fresh water lake where several species of water birds are regularly observed, some of which –most significantly the endangered Marbled Teal (Marmaronetta angustirostris)– nest there. The development of an environmental education programme led to the creation of the CNEE; following an assessment of its activities, a new agreement was signed with the Moroccan forestry department regarding the management of the entire SBG site by SPANA. Overall, the challenge is to develop and apply a management plan for the site which will involve all the actors concerned as well as the local population, thus eliminating any potential threat to the site. A ‘Culture and Nature project is also under development at the Sidi Boughaba site, the Kasbah and the beach.

Keywords: Culture, nature, education, Sidi Boughaba, Morocco, Ramsar site

Introduction

Wetlands are ecosystems with multiple values: production, recreation, culture and history. Subject to many pressures and threats, including pollution, over-exploitation, urban encroachment and unsustainable tourist projects, they are complex ecosystems in which conservation intervention is not an easy task and
must involve several actors: governments, elected representatives, civil society, populations and the private sector. Given this complexity, environmental education plays a fundamental role in raising awareness and leading all the actors to act in synergy, thereby achieving effective conservation outcomes.

The Sidi Boughaba (SBG) wetland is a good example of international institutions (the European Union, BirdLife International, the British charity known as the Society for the Protection of Animals Abroad [SPAN/UK]) and national institutions (the Government of Morocco and the Moroccan NGO SPANA) joining forces to participate in this awareness-raising through the development of an environmental education programme and the creation of a National Centre of Environmental Education.

**History of the Sidi Boughaba Site**

The SBG wetland site is situated in north-western Morocco, in the most populated part of the country (Fig. 5.5).

The name of the site comes from the marabout Sidi Boughaba, a saint who is still honoured annually by pilgrims at the time of the *moussem* (gatherings of people at the end of the harvest season). Over time, several names have been given to this site and the surrounding region, which attracted Neolithic populations to its rivers, and in particularly to the Sebou. Different Phoenician and Roman names have been mentioned by historians for some parts of the site, including Benasa, Thamusida, Thymaterion, Sebour and Sidi Bou Ghaba, which included Khénitra city and Mehdya and Fouarat villages.

During the twelfth century, Europeans used the site as a market place. It was called Mamora and played a significant role as a military base for defending
against Portuguese and Spanish invasions. The Sanjoao Da Mamora fortress was built during the Portuguese occupation in the sixteenth century, and restored by the Moroccans 46 years later.

At the beginning of the seventeenth century, the city became a refuge for Moroccan pirates and people of several other nationalities, especially English and Dutch. Following the Spanish occupation, a new name was given to the site: San Miguel de Ultramar.

In 1681, the site was liberated by King Moulay Ismail, and functioned as a commercial harbour under the name of Mehdya with fortifications in the form of a Kasbah (traditional Moroccan fort) (Fig. 5.6).

Fig. 5.6 Main gate of Mehdya Kasbah.

Fig. 5.7 Marabout and the ruins of Mehdya Kasbah.
In 1795, the harbour was closed by king Moulay Slimane to prevent European penetration, leading to the decline and abandonment of the Kasbah.

In 1911, the site was used as a base by the French military called in by king Moulay Hafid to help put down the rebellion of Fes. After the protectorate treaty of 1912, a new harbour was built at Khénitra by the French resident general Lyautey.

During an American action against the Vichy government in 1942 (Operation Torch), the majority of the Kasbah was demolished, (Fig.5.7). This was followed by the construction of an American base between Mehdyia and Khénitra.

Nowadays, the area includes only a small fishing port, a residential quarter (Mehdyia Kasbah) and a seaside resort, which benefits from the beach, the lake and the forest of Sidi Boughaba.

**Protection status and land tenure**

In 1916, the site’s conservation boundaries were defined and it became the property of the state. Classified in 1951 as a national heritage area by the Ministry of Cultural Affairs and the Forestry department, it was designated a permanent hunting reserve in 1975, and it was declared a biological reserve in 1980.

The present site (800 ha) includes a permanent biological reserve of 613 ha, which consists of 423 ha of natural forest, 60 ha of planted forest, 113 ha of open water lake, 10 ha of roads and tracks, 7 ha of buildings and 187 ha of common tribal lands.

**Richness of the SBG site**

The SBG forest consists mainly of red juniper trees. It is the last remnant of the natural vegetation that covered the Moroccan north-western coast during the Quaternary era. The forest is well adapted to the climatic conditions of the region. It fixes sand dunes and is resilient to saltwater spray and drought.

The SBG site is characterised by its rich biodiversity with more than 210 species of plants, many mammals, reptiles and birds.

The SBG Lake is a coastal freshwater lake which does not connect to the sea. It is predominantly ground-water fed, and its salinity is between 4 and 15 g/l. The lake contains very diverse hydrophilic vegetation, making it a rare habitat for this area.

The site’s significance as an important north-south migration route for waterbirds is linked to its hydro-biological and geographical characteristics (Fig. 5.8). This significance was internationally recognised by the listing of the site under the Ramsar Convention by the Moroccan government in 1980.
Ninety-nine species of waterbirds have been recorded at SBG, of which 59 are observed regularly within the site and 34 breed there. Sidi Boughaba is also a breeding site for the globally endangered Marbled Teal (*Marmaronetta angustirostris*), whose numbers vary from 2 to 12 pairs.

**Fig. 5.8 Bird migratory routes.**

**SPANA activities at Sidi Boughaba**

SPANA, the Société Protectrice des Animaux et de la Nature (formerly the Société Protectrice des Animaux [SPA]), is a Moroccan NGO affiliated to the British charity SPANA/UK. In the past, its main activity was the treatment of animals in hospitals and mobile clinics. Gradually, the organisation has initiated efforts to change the attitude of people towards animals and nature. That is why SPA signed an agreement with relevant ministries in 1986 to develop environmental education programmes and to undertake nature conservation activities. SPA then became SPANA and adopted the following expanded objectives:

– Protection of domestic animals and livestock.
– Training, awareness and environmental education.
– Conservation of the natural heritage.
In order to achieve its new objectives, SPANA financed by the EU and by SPANA/UK and in partnership with BirdLife International, built the National Centre for Environmental Education ‘CNEE’ in 1992, when its 10 regional animal hospitals also became education centres.

The credibility gained by SPANA’s success in the environmental education field led to the signing in 2002 of a new agreement with the forestry department for the management of the entire SBG site by SPANA.

**SPANA’s education programme**

SPANA’s education programme is divided into activities undertaken for the following three target groups:

i. School groups: Monday to Friday, the SPANA bus brings in groups of children from primary and secondary schools in neighbouring cities for a special programme of activities designed by teachers and based on the centre’s objectives (Fig. 5.9).

The Ministry of Education has appointed one teacher from each regional office to participate along with members of SPANA staff in different activities that form part of the programme. These teachers have been specially trained in environmental matters by SPANA.

![Fig. 5.9 A school group visiting the SBG site.](image)

ii. Students: The CNEE also hosts university students and their professors (in the fields of Agriculture, Forestry, Veterinary Science, Biology and the Environmental Sciences) for different field activities.

iii. General public: On Saturdays, Sundays and holidays, the CNEE offers information and activities to the general public:
– Awareness-raising leaflets and other documents upon entry to the centre;
– A permanent interactive exhibition designed to raise public awareness of local environmental problems and the richness of the site’s flora and fauna;
– Birdwatching.

The CNEE also organises special events for World Wetlands Day, World Animals Day, World Environment Day and World Forest Day.

A day-long programme for school groups at SBG

This activity is divided into two parts:

The first part is common to all groups and is scheduled as follows:
– 9:00 : Arrival of the group
– 9:00 - 9:10 : Orientation
– 9:10 - 9:25 : Presentation of the SBG reserve
– 9:30 - 10:10 : Visit to the forest
– 10:20 - 11:00 : Exploration of aquatic life
– 11:10 - 12:00 : Observation of birds
– 12:00 - 13:20 : Lunch
– 13:35 - 14:30 : Visit to the interactive exhibition.

The second part, scheduled for the afternoon, depends on the teacher’s choice from the following modules: Pollution, Forest, Climate and Climate change, Water, Migration, Soil, Trees, Adaptation, Biodiversity, Reproduction of animals and plants, Movement of animals and plants, Pets and domestic animals, the Life of plants, Interdependence, the Life of animals, Man and environment, Population and natural resources, Culture and nature.

Threats, impacts and future perspectives

The SPANA education programme has had an impact on those who benefit from the programme directly, but also on the country as a whole. For example, in many protected areas, education centres are beginning to emerge and to seek SPANA’s assistance. Many schools use SPANA publications as teaching materials, stress the role of NGOs in nature conservation and use CNEE activity programmes as a model for visits and field trips.

SPANA’s activities and achievements have given the centre a credible reputation and allowed its voice to be heard at official levels. The most recent example of this is the recommendation by the Ministry of Education to add SPANA to the group revising the national school curriculum.
Unfortunately, the success of this education programme does not remove the risk of threats to the site. Examples of continuing problems include:

– sedimentation in the lake and loss of open water to expanding vegetation (loss of 1 ha/year);
– disturbance of the fauna and trampling of plants by visitors (60 000 visitors/year and 3000 visitors/day on Sundays from March to April);
– grazing within the site by livestock belonging to neighbouring farmers;
– pollution by effluents and refuse from neighbouring settlements and visitors;
– land encroachment by squatters (50 cases brought to court) and development of unsustainable tourism projects; and
– lack of co-ordination and synergy between stakeholders during urban development planning.

To respond to these threats, SPANA is preparing a management plan for the site with the participation of all stakeholders, as well as the local population and visitors. One aspect of such a management plan will be the development of a ‘Culture and Nature’ project in the SBG site, the kasbah and the beach.

The objective of the ‘Culture and Nature’ project, which is still in the planning stage, is to allow numerous tourists and visitors to the beaches of Mehdyà city and its surrounding area to discover the natural assets not only of the SBG site but also those of another nearby Ramsar site, Merja Zerga, as well as of the coast, the Sebou river and the Mamora forest. This latter is one of the most significant cork oak forests in the world. Visitors will also discover the rich cultural heritage of the region’s cities and villages.

The project, based on the principle ‘it is necessary to know in order to love, and once you love you protect’ aims to create circuits of one or more days for tourists to follow on foot, on horseback, on bicycles or in cars. It can promote the rehabilitation and restoration of historic monuments, create jobs to relieve pressure on natural resources, channel visitors to limit their negative impact within the framework of responsible ecotourism, making them aware of local crafts and culinary products such as truffles, mushrooms, honey or medicinal and aromatic plants.

This project can only succeed if all the parties concerned adopt it and participate in it. The CNEE can play a major role in raising awareness and training, particularly of guides and tourism professionals.
5.2 Traditional knowledge

The value of traditional knowledge was ignored for a long time by scientists and conservationists, especially in the developed countries of the West. This negative attitude has been changing over the past two or three decades, as deeper understanding of the knowledge and practices of indigenous peoples and local communities has emerged, and the concrete benefits of these practices for contemporary human societies has been confirmed.

Ramsar Guidance

A positive attitude towards traditional knowledge was adopted by the Ramsar Convention in Resolutions on culture and on participatory management, as well as in the Strategic Plan4; and is expressed clearly in the following objective (Ramsar Guidance, p. 59).

O.4.2 –
To record traditional knowledge, keep it alive and learn from it

Before promoting and trying to incorporate new water management technologies and approaches:

a) make an inventory of the traditional approaches to water resources management, both those still being practised and, if possible, those that have been abandoned;

b) undertake a careful analysis and assessment of their advantages and weaknesses;

c) study the possibilities of improving these approaches through the careful use of cost-effective contemporary and innovative methods. The goal should be to meld the old with the new, not necessarily to replace the traditional practices;

d) test the resulting composite approaches in selected pilot cases; and

e) make the lessons learnt widely known, in developing and developed countries alike.

Additional actions required may include the following:

f) search for linkages between traditional knowledge and wetlands, and in particular with wetland flora;

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g) establish systematic cooperation with the organisations interested in this matter, such as the Society for Economic Botany, the International Society for Ethnobiology, the Centre for International Ethnomedicinal Education and Research, the Society for Medical Anthropology, and others;

h) urge that the Ad-Hoc Open-ended Inter-Sessional Working Group on Article 8(j) and Related Provisions of the Convention on Biological Diversity incorporates fully all wetland-related issues in its work and [time-limited action on a specific report now removed]; and

i) disseminate information about traditional medicines related to wetlands as part of public awareness activities, and encourage the trend towards using again traditional medicines in societies that had, to a large extent, abandoned them, in relation to wetlands and water resources aspects.

On a general level, what should be noted in this guidance is first the need to study traditional practices in depth and develop a better understanding of the useful knowledge they contain. Obviously, this must be done in an objective and pragmatic manner, without either preconceived negative attitudes or naive, ideological beliefs. Nowhere is this more necessary than in the wise management of water supply and demand, which has been carried out in the Mediterranean for millennia, often through ingenious social and technical measures, for example in the water tribunal of Valencia. In this process, the cultural values inherent in traditional practices should not be neglected, as they constitute an integral part of human activities.

An important next step is to consider whether these traditional practices can be incorporated in contemporary technical approaches to wetland management, attempting to establish synergy from both. The mutual benefits obtained must be tested and confirmed in the field. Once positive results have been obtained, they must be widely disseminated. The present book is a small step in this direction.

The Ramsar Guidance places considerable emphasis on the medicinal use of wetland flora and fauna species. The theme of World Wetlands Day in 2008 was ‘healthy wetlands, healthy people’, which provided an opportunity to note that medicinal plants have been used since 4000 BC, and that between 50 000 and 70 000 species are in use today throughout the world by 70-80% of the global human population, also providing local income. The products concerned are mainly herbal medicaments used in traditional medicine, alternative medicine (such as homeopathy and Ayurvedic medicine) and modern western medicine, and many grow near wetlands, such as the amaranth (of the Amaranthaceae family), false daisy (*Eclipta alba*), aloe (*Aloe vera*) and yellow spider flower (*Cleome viscosa*).
In the Mediterranean, Hippocrates based his therapeutic approach on the ‘healing power of nature’ and used various forms of drugs derived from local plants. He believed in exercise and rest, a good diet (his famous quote was ‘Let your food be your medicine, and your medicine be your food’), fresh air and cleanliness. In the Hippocratic Corpus, a collection of seventy medical works written by him and his students, the use of herbs is recorded as the way to balance the ‘four humours’ (basic elements) of the human body, a primary technique to restore good health. Several of these plants grow near wetlands, such as the tamarisk (of the Tamaricaceae family), coriander (Coriandrum sativum), watercress (Nasturtium officinale) and the white willow (Salix alba).

Traditional Yunani medicine was brought back to the Mediterranean with the Arab invasions. Yunani refers to medical knowledge that originated from the techniques of the ancient Greeks, especially the work of Galen, combined with principles on hygiene, diet and healing instructions based on the guidance of the Prophet (Ebrahimnejad, 2005). The Arab Yunani physicians also used herbs as fundamental ingredients for the production of drugs, many of which grow near water (such as brahmi [Bacopa monnieri], arjun tree [Terminalia arjuna], guduchi [Tinospora cordifolia] and ginger [Zingiber officinale]).

Unfortunately, a considerable portion of traditional knowledge is only preserved orally, and is thus at higher risk of being lost over time. The Ramsar Guidance provides the following related objective and actions:

**O.4.2.1**

**To safeguard wetland-related oral traditions**

The following actions may be required:

a) record in a systematic manner wetland-related oral traditions;

b) promote the appreciation of the value of these traditions as part of the cultural heritage and encourage local groups to maintain them;

c) consider establishing an archive of oral traditions in digital form; and

d) disseminate by all appropriate means the information collected.

An interesting example of the work that needs to be done comes from the Prespa Lakes in northern Greece. There is now only one elderly craftsman left who has the knowledge required to construct traditional wooden boats. The Prespa Centre for Man and Nature is launching a project to have this craftsman construct...
such a boat once more and to document the entire process in text and video, so the requisite traditional knowledge is not lost. In addition, local inhabitants will be invited to participate in the process, to spread the knowledge more widely.

Case study

In the next paper, Myrsini Malacou, the director of the Society for the Protection of Prespa, portrays the importance of traditional ecological knowledge and how it can be used successfully in wetland management practices. The Prespa Lakes form a transboundary wetland site shared by the peoples of Albania, FYROM and Greece who have a common natural and cultural heritage that needs to be safeguarded and managed sustainably. Effective communication among the three sides, community participation, bottom-up approaches and related management methods have been used, resulting in a strengthened link between conservation practices and economic development.

References


Traditional ecological knowledge, conservation and socio-ecological perspectives in the Prespa transboundary Park

Myrsini Malacou

Abstract

Traditional ecological knowledge has been widely recognised for its value in the conservation of natural resources and sustainable resource management. The role of traditional ecological knowledge in a transboundary area such as the Prespa Park has proven crucial for the promotion of integrated river basin management and the conceptualisation of the area as one common basin in which three peoples thrive. Adaptive co-management, along with the promotion of institutional development, the improvement of social mechanisms, the organisation of polycentric and non-hierarchical bodies, bottom-up approaches and the sharing of knowledge and communication networks at the tri-national level have served as a catalyst for developing appropriate world views and prospects among stakeholders. Special emphasis has been placed on the efforts of the Society for the Protection of Prespa, a non-governmental organisation, as a key player which has played an instrumental role in promoting changes in the established structures of decision making and governance, mobilising social networks, generating knowledge and enabling information flows, integrating traditional ecological knowledge with adaptive management practices, recognising the values and functions of the wetland and its catchment basin and promoting collaborative learning by trial and error. As a result, the area’s capacity to link conservation with development has been enhanced, along with its ability to manage ecosystems sustainably and its resilience to future changes and unpredictable events.

Keywords: Traditional ecological knowledge, transboundary protected area, community-based conservation, social-ecological systems, adaptive management

Traditional ecological knowledge

Traditional ecological knowledge (TEK) can represent experience acquired over thousands of years of direct human contact with the environment (Berkes, 1993). The term came into widespread use in the 1980s, and became established through the work, inter alia, of the World Conservation Union (IUCN) working group of the same name (Johannes, 1989; Berkes et al., 2000). Given the absence
of a universally accepted definition of traditional ecological knowledge, the present text will adopt the definition proposed by Berkes et al. (2000), to the effect that TEK is a ‘cumulative body of knowledge, practice, and belief, evolving by adaptive processes and handed down through generations by cultural transmission, about the relationship of living beings (including humans) with one another and with their environment’. According to the IUCN (1986), TEK, among other systems, offers biological knowledge and ecological insights, provides models for sustainable resource management and is often crucial for development planning (Berkes et al., 2000; McGregor, 2004). TEK is generally restricted in geographical scale, relies on mainly qualitative (rather than quantitative) information, is built upon trial-and-error processes, is adaptive by nature and encompasses a broad social and spiritual context. As a result, TEK is considered to be a distinct knowledge system which integrates knowledge, practices, experiences and beliefs, and which constitutes an important component of social memory⁶ (Berkes et al., 2000; McGregor, 2004; Folke et al., 2005). Traditional ecological knowledge is an attribute of societies with historical continuity in resource use practices: these are usually non-industrialised, often indigenous or tribal, societies (Berkes et al., 1995; Berkes et al., 2000).

TEK has received increased attention over the last two decades, particularly in the areas of conservation management and sustainable development (Williams and Baines, 1993; WCED, 1987)⁷. Holling, (2002) has stated that: ‘sustainable development and management of global and regional resources is not an ecological problem, nor an economic one, nor a social one. It is a combination of all three’. In this context, the term ‘social-ecological system’ has been proposed (Berkes and Folke, 1998) to emphasise that humans must be seen as part of—not apart from—nature, that the delineation between social and ecological systems is largely artificial and arbitrary, and that it is important to recognise the dynamic interactions between societies and natural systems, rather than viewing people merely as ‘managers’ or ‘stressors’ (Berkes, 2003). In recent decades, it has become widely accepted that ecosystem management requires an understanding not only of ecological systems, but also of integrated social-ecological systems in which traditional ecological knowledge is included as an important source of

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⁶ Social memory is the arena in which the captured experience of change and successful adaptations embedded in a deeper level of values is actualised through community debate and decision-making processes into appropriate strategies for dealing with ongoing change (Folke, 2003).

⁷ The term ‘sustainable development’ is used in the same sense as in the World Commission on Environment and Development (WCED) report entitled ‘Our Common Future’ and also known as the Bruntland report after its Chair, Gro Harlem Brundtland: i.e. ‘sustainable development is a progress that meets the needs of the present without compromising the ability of future generations to meet their own needs’. One of the seminal environmental documents of the twentieth century, the report re-examines the critical environmental and development problems on the planet and works within the framework of Environmentally Sustainable Development. It approaches the environmental and development issues facing the world as one common challenge to be solved by collective multilateral action. Approaching common concerns with a holistic perspective, the report makes institutional and legal recommendations for changes needed to confront common global problems. Critical amongst these recommendations is the call for the development and expansion of international institutions for co-operation and legal mechanisms to confront common concerns.
understanding (Olsson et al., 2004). This paper discusses the role of TEK and its link with the social-ecological system of—and conservation initiatives in—the Prespa transboundary Park.

The Prespa Lakes: riches and problems

The Prespa area is situated in the Balkans and is shared between Albania, Greece and the Former Yugoslav Republic of Macedonia (FYROM). It comprises two lakes (lying at 850 m a.s.l.) and their surrounding catchment basin. The two lakes, along with the hydrologically connected Lake Ohrid, are the most interesting components of the park and the oldest lakes in Europe (Hutchinson, 1957). The two Prespa lakes are of tectonic origin, with an estimated age of anywhere between 2 and 35 million years (Jakovljevic’, 1935; Stankovic, 1960; Eftimi, et al., 2001). Prespa is well-known for its high nature conservation interest, and especially for its rare waterbirds (Crivelli, et al., 1997; Matzinger et al., 2006; Loeffler et al., 1998) and a high degree of endemism especially among its plants, invertebrates and fish (Crivelli et al., 1997; Smith, et al., 2006). The entire catchment basin along with the two lakes has protected area status in Greece and Albania, while most of the FYROM section is protected by two national parks and one Ramsar wetland site. In 2000, the transboundary Prespa Park was established through a Joint Declaration of the three Prime Ministers, while ten years later, in 2010, an official Joint Agreement on the Protection and Sustainable Development of the Prespa Park area was signed by the three countries and the European Commission. Prespa is the first transboundary park in the Balkans, and the path to its current status was not an easy one, despite its wealth of socio-ecological aspects.

Lying on the borders between three countries, Prespa is isolated and relatively distant from major population centres and the three countries’ capitals. Nowadays, there are approximately 25,000 people in the whole Prespa basin8, the majority of them occupied in primary resource production, while secondary and tertiary industries—mostly in tourism and small to medium enterprises—are growing mainly in Greece and FYROM. A common characteristic of the area in all three countries is its turbulent history, which until the early 1960s was characterised by conflict (including a civil war in Greece), the translocation of local populations and the immigration of new people from other parts of each country. The existing population, including the new immigrants, was mainly occupied in the primary production sector and with traditional activities. Wars and translocations raised issues of national identity for the local populations, resulting in socio-economic instability, abrupt population changes and—hence—continuous changes in the structure, components, and ethics of local societies (Catsadorakis and Malacou, 1997). All of these socio-economic changes had an impact on the traditional ecological knowledge of the area, and in turn on the management of its social-ecological system.

8 Albania: 12 villages (5000 people), FYROM: 44 villages (18 000 people), Greece: 10 villages (2000 people).
Before the Second World War, local people in Prespa lived in a subsistence economy and exploited the natural resources of the area extensively. They made use of TEK (passed down from one generation to another, but generally not recorded) and employed technically rudimentary environmental management practices. Moving from one country to another was possible through local border crossings, and Prespa was regarded as a single geographical entity (the catchment basin) in which people of different nationalities thrived together. The natural environment, biodiversity, conservation, spatial planning, development, economy, society and religion were not separate spheres, but rather integrated aspects of life. Family bonds and co-operation in social clusters were strong and essential, and formed a local governance system that integrated TEK (Vafiadis, 1940). Consequently, traditional ecological knowledge was more than a knowledge system; it incorporated a social, institutional, spiritual and cultural context, and therefore represented an entire way of life. In this context, one can say that Prespa’s current well-preserved habitat and species status is undoubtedly related to the area’s TEK.

In addition, TEK, as in Berkes et al. (1995), also included provisions for the total protection of specific biological communities or habitat patches which were mainly linked to spiritual or religious places, the total protection of selected species and the protection of critical life-history stages (i.e. fish spawning seasons), all of which conserved and enhanced biodiversity. However, there are cases of mass fish deaths in the lakes, erosion due to non-rational cultivation practices or wide-ranging forest fires lasting for months, and the local society had no means to foresee or intervene in these occurrences. However, despite the fact that TEK and practices generally promoted sustainability (with regard to natural resources), depopulation, poverty and isolation prevailed on the socio-economic front, resulting in migration and the outflow of younger generations.

In the 1970s, the Greek state decided to boost economic development in Prespa to try and stem the depopulation on its north-western borders, and invested heav-
ily in rural development, including the construction of an extensive irrigation network, wetland drainage, extensive tree cutting and industrial development. Intensive agriculture, in the context of an economy dependent on EU subsidies, resulted in the unsustainable use of natural resources and the severe destruction of habitats, especially wetlands. Intensification of agriculture resulted in the abandonment, or phasing out, of other primary production activities such as cattle raising and fishing, ending the more ‘indirect’ methods of managing Prespa’s habitats which had previously been applied.

While these changes were occurring and the local people were being transformed from an ‘ecosystem people’ into a ‘biosphere people’ (Berkes et al., 1995), many of the traditional cultivation and husbandry activities –especially those that seemed to stress natural resources– were proscribed as incompatible with nature protection.

At this time, the decision-making system was centralised, while the local institutional framework remained poor and profoundly inadequate to serve the new socio-economic and socio-ecological needs. Interestingly, on the socio-economic front, although local income increased significantly, the feeling of isolation and marginality persisted. The local people invested their income in nearby cities, and Prespa became more of a place to work than a place to live. As a result, depopulation and migration continued at the same pace.

Responsibility for ‘nature conservation’, then a newly-introduced idea, was entrusted to public services and the scientific community, both of which settled matters from outside the area. TEK was not then appraised as a different knowledge and management system: being regarded as an attribute of a poor and miserable way of life, it became devalued and ignored by most stakeholders –e.g. local people, scientists and the state authorities.

In parallel with these developments, due to differences between their political regimes, the three countries blocked any form of co-operation and communication between the local peoples who shared the occupation of the area. Consequently, local stakeholders came to have a more fragmented view of the Prespa catchment basin and its eco-hydrological functions and management needs.

The need for and mission of the SPP

In the late 1980s, it became apparent that the current status quo did not ensure sustainable or improved conservation or a socio-economic future for the area. Heavy infrastructure works such as drainage of the wetlands, construction of an extensive irrigation network and industrial development were not in themselves

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9 Dasmann (1988) contrasts ‘ecosystem people’ with ‘biosphere people’: the latter draw resources from afar, the former primarily from their own land.
enough to strengthen the local society’s resilience to changes\textsuperscript{10}. Similarly, among the conservationists who had already invested a lot of effort in the conservation of rare species and habitats in the area, it became apparent that its biological diversity could not be maintained by the actions of the conservation sector alone. Focusing only on the ‘conservation’ side as a basis for sustainability decision-making was leading to an excessively narrow approach, and ultimately to non-sustainable results. It was becoming ever more apparent that a new and more integrated approach to natural, socio-economic and hence socio-ecological challenges was required (Catsadorakis and Malacou, 1997).

\textbf{Fig. 5.11} Water buffalo in the Prespa Lakes.

In the early 1990s, reviewing the unsatisfactory levels of effectiveness of conservation activities in the area, ten leading Greek and international conservation NGOs and individuals decided to establish the Society for the Protection of Prespa (SPP), an umbrella NGO based in a village in Greek Prespa\textsuperscript{11}. The SPP’s mission ever since has been to maintain and strengthen the relationship between people and nature in the region, and to preserve the natural and cultural heritage of Prespa for the benefit of its inhabitants and of all those interested and concerned, today and in the future.

In order to achieve its mission, SPP has adopted four main strategies:

– enhancing and integrating TEK into conservation efforts, management methods, technology and modern ways of life;

\textsuperscript{10} Resilience is the capacity to lead a continued existence by incorporating change and is often used to describe the features of a system that are related to sustainability and sustainable development. (Milestad and Hadatsch, 2003).

\textsuperscript{11} The members of the SPP are: WWF Greece, the Friends of Prespa, the Society for the Environment and Cultural Heritage, the Hellenic Society for the Protection of Nature, the Hellenic Ornithological Society, the Goulandris Museum of Natural History, Arcturos, the Tour du Valat Foundation, the Danish Ornithological Society and the Royal Society for the Protection of Birds (UK).
– raising interest and seeking the active participation of stakeholders (local and external) in socio-ecological, conservation and sustainable development issues;
– organising stakeholders in all three countries and establishing a common basis of information and understanding;
– catalysing and promoting institutional developments (at the local, national or tri-national level) to support this approach, and hence securing changes in established perceptions and/or structures, especially those relating to conservation, natural resource management, governance and decision-making.

Fig. 5.12 Bean cultivations in the summer.

The SPP has initiated a series of projects concerned with the integration of wetland management and the conservation of selected rare species or habitats (e.g. pelicans, endemic fish, waterbirds, wet meadows) using TEK and traditional primary production activities. Initially, the implementation of management processes that could reveal or generate learning, meaning, knowledge and experience of ecosystem dynamics was almost impossible, because, in conjunction with changing perspectives on national identity, perceptions of the importance of this knowledge had been entirely lost or rejected by decision-makers and stakeholders.

**Developing a common approach**

In the early 1990s, the SPP started working with the local society on the Greek side which, although relevant to traditional perspectives, actually had limited ‘historical continuity in the area’s resource use practices’ (see the discussion on traditional ecological concepts above) due to continuous wars and the translocations of people. In addition, the SPP was established at a time (1991) when the former regimes in the two neighbouring countries (Albania and the Former Yu-
goslov Republic of Macedonia) had collapsed. Consequently, the area’s stakeholders’\textsuperscript{12} perceptions, as well as the sources of TEK, naturally broadened to encompass all three peoples sharing the basin. At least in theory, these regime changes made communication and co-operation possible between countries and peoples, while also increasing local people’s desire to overcome their isolation. On the other hand, formal governance schemes became less flexible as a result of mutual suspicions and fears of the ‘new’ neighbours, making formal co-operation almost impossible to achieve. As a result, making TEK or a range of different knowledge systems in all three countries more explicit was not an easy task. In order to overcome this, the SPP focused its efforts on common social memory\textsuperscript{13}, which was linked mainly to the primary production activities practiced for centuries by Balkan people of all ethnicities.

As has been shown, at this first level of co-operation between different ethnic groups and different stakeholder interest groups, TEK constituted a common basis for connecting, establishing links and beginning a discourse. Besides integrating and enhancing ecosystem knowledge, TEK was also an important tool for reviving links and developing trust and awareness between different stakeholders of different nationalities and interests. In a way that became recognised by ‘external’ stakeholders, such as central state authorities, TEK served as a catalyst for the whole process of co-operation and communication between interested parties in the three countries. Moreover, TEK was a critical factor in the reconfirmation of Prespa as a model of an area that needs to be conceptualised as an entire lake basin/catchment and managed within a framework of integrated river basin management.

The revitalisation and use of TEK in management systems was not, however, sufficient in itself to achieve positive results. In parallel with direct conservation actions, the development of appropriate formal and informal institutional and communication frameworks was pursued as steps towards the aim of better integration (rather than exclusion or marginalisation) of traditional perspectives. As mentioned in various publications (Berkes et al., 1995; Berkes, et al., 2000; Berkes, 2003; Folke, 2004), the practice and development of traditional ecological knowledge was supported for generations by an integrated social and institutional context. In the case of Prespa, this context has become extremely difficult or impossible to maintain, mainly due to the historical and socio-economic reasons mentioned above. SPP studies focused on this issue produced the understanding that new multi-stakeholder, non-hierarchical and polycentric (mainly informal) governance systems needed to be organised and introduced. These systems were complemented by similar –often non-typical– communication

\textsuperscript{12} As in Golder and Gawler, 2005: A [project] ‘stakeholder’ is defined as: ‘Any individual, group, or institution who has a vested interest in the natural resources of the project area and/or who potentially will be affected by project activities and have something to gain or lose if conditions change or stay the same’.

\textsuperscript{13} Collective memory/experience, used in times of change or uncertainty (Bodin, 2006).
or co-operation channels and networks which were established when and where needed. The sharing of responsibility and active rather than passive approaches to participation were basic strategical tools that needed to be re-introduced or revitalised in local societies. These approaches had to be based on an integration of the expert-based findings with the TEK, resulting in participatory conservation and adaptive management practices. The promotion of conservation and sustainable development goals required bottom-up approaches and the widespread use of the subsidiary principle: i.e. as much local problem solving as possible, and only as much government regulation as needed (as in Berkes, 1991).

More specifically, in order to enhance the area’s institutional and management capacity to deal with changes in nature and socio-economic factors, the SPP has promoted TEK knowledge based on adaptive management practices\textsuperscript{14,15}, organised multi-stakeholder networks and polycentric informal governance schemes, increased social and institutional learning in conservation and management, sought the improved governance of multilevel organisations and promoted an evolution of different forms of social participation. Through these processes, the social capital of the area has gradually increased. The establishment of non-hierarchical institutions like the Prespa Park Co-ordination Committee, community- and locally-based committees like the National Park’s Wetland Management Committee (in Greece), along with more formal transboundary bodies such as the newly-established Prespa (Transboundary) Park Management Committee, has increased the institutional organisation and awareness of local society. These activities have also enhanced existing government schemes and, in combination with other measures, gradually promoted the connectedness and resilience of local communities\textsuperscript{16}.

A range of initiatives including the trilateral declaration of the Prespa transboundary Park, the establishment of a new legislative framework and new multi-stakeholder bodies for the Park, the development of a joint Strategic Action Plan, the organisation of a transboundary monitoring system, the completion of a Spatial Planning Study for the Greek side of Prespa, and the promotion of trademarked ‘Prespa Park Products’ (PPP) were all achieved primarily via bottom-up multi-scale participation, communication and multilayered networking activities by a variety of stakeholders.

SPP activities have targeted both nature conservation results and the enhancement of the adaptive management and governance capacity and skills of local society. Underpinned by the rationale that the road to a sustainable future is as important and valuable as sustainability itself, new governance and communica-

\textsuperscript{14} As the ‘more realistic and promising approach to deal with ecosystem complexity’ (Gunderson, 1999).

\textsuperscript{15} Adaptive co-management as in Dietz et al., 2003 i.e. the combining and operationalising of adaptive management and adaptive governance.

\textsuperscript{16} Resilience as the capacity to lead a continued existence by incorporating change (Milestad and Hadatsch, 2003).
tion tools were used which promoted the so-called ‘institutional development’ of local society, including all the equally valuable features of conservation aspects.

Despite many difficulties –especially in the beginning– SPP investment in the conservation and management of natural and cultural values, TEK included, has resulted in significant conservation benefits and a marked increase in the populations of globally threatened species such as the Dalmatian Pelican. Conservation initiatives have been linked with the local economy and livelihoods, while informal systems of governance were tested, increasing ownership and participation in the process. Failures were used to adjust these systems to reality rather to demolish them (see further details in Kazoglou Y. p. 146 here in).

Successful conservation initiatives have increased the area’s recognition and reduced its sense of isolation and marginalisation. The active participation of local stakeholders –expressed both as opposition and as consensus– has stimulated the integration of local society into these efforts, helping reduce the risk of feelings of divisiveness. These approaches also proved to be important in reducing emigration from the area (especially in Greek Prespa, where the local population has in fact increased), leading to an improvement in the local economy and the transformation of a feeling of ‘stalemate’ for the future into a vision of prosperity.

It is notable that an ‘externally’ created NGO (i.e. SPP, which consists of seven Greek and three international members but is based locally) acted as a bridging organisation with the necessary flexibility, capacity and tenacity to foster local interest, elicit trust and create a common platform for communication and a common framework of agreed principles for action.

![Red peppers being dried in the traditional way.](image-url)
Future perspectives

However, these actions are only a start. At present, the only official multi-stakeholder body at the transboundary level is the Prespa Park Management Committee, whose ambit is limited to the trilateral agreement for the management and sustainable development of the Prespa Park. In Greece, such multi-stakeholder bodies are still few in number (e.g. the Management Body for the Prespa National Park) and are often used by state or local agencies to increase legitimacy or manage conflicts rather than for the promotion of shared and adaptive management. As a result, the achievement of real joint management is still afar from easy: in comparison with the past, however, a much improved basis has been established, and the results are already promising, although the target –meaning a sustainable social-ecological system in Prespa– is still a long way off. Adaptive co-management along with the enhancement of the social-ecological system’s resilience are the main prerequisites at the transboundary Prespa level. To this end, social learning and knowledge transfer (including TEK) (Berkes, 2003; Frantzeskaki and Thissen, 2009), the creation of a ‘common language’ among stakeholders, the establishment of a multi-layered institutional architecture including flexible organisations capable of facilitating governance, the accountable leadership of existing hierarchical bureaucracies, and investment in social capital and trust are of the utmost importance.

It is clear that, in order to achieve conservation and sustainable natural resources management and to advance the Prespa area’s overall environmental sustainability, actions will have to be extended to integrate local economic, landscape, spatial planning, cultural and spiritual aspects, including those which formerly had a prominent position in traditional local society and knowledge. At the same time, learning to live with change and uncertainty, combining different types of knowledge and learning, creating opportunities for self-organisation with a view to socio-ecological resilience, and nurturing additional support for resilience, renewal and re-organisation (Folke et al., 2005) will all be critical in promoting the area’s long-term sustainability.

On this point, the role of international bodies such as the Mediterranean Wetlands Initiative (MedWet), the Ramsar Convention, WWF International and BirdLife International should not be underestimated, since these ‘external stakeholders’ could act catalytically in cases where ongoing unsolved problems and conflicts exist in the socio-ecological systems. According to Holling (1986), in cases where such systems reach stage (a)\(^1\), the support of the international

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\(^1\) Stage (a) is part of Holling’s (1986) adaptive cycle: temporal changes in a system proceed through phases of growth (r), conservation (k), release (Q), and reorganisation (a). In the adaptive cycle, the temporal changes of a system proceed through phases of growth (r), conservation (k), release (Q), and reorganisation (a). An adaptive cycle describes the process of development and decay in a system (Holling and Gunderson 2002; Gamestani et al., 2009). The brief initial stage of development, the r stage, consists of the rapid exploitation and garnering of resources by system components. This is followed by a k stage of longer duration characterised by the accumulation of capital or other system elements or energies, and by increasing connectivity and rigidity that eventually lead to a loss of resilience and the collapse of the system. The Q stage of collapse is rapid and unleashes the energy accumulated and stored during the k phase. The Q phase is followed by reorganisation during the a phase, a relatively rapid period of assembly of components. It is at the reorganisation stage that the system can shift regimes into a new or different configuration.
organisations could prove critical, since they can share the key roles of leaders and stewards, participate catalytically in building trust, facilitate horizontal and vertical linkages in an integrated catchment approach, promote adaptive management and serve as key players in institution-building, organisational change and the promotion of social networks.

In social-ecological systems such as Prespa with historical discontinuities in their past, a turbulent present and a future which is continuously opening out towards the global, the issue of how to seek a sustainable future is an important one. To this end, international experience along with local traditional ecological knowledge and governance systems are important resources on which local societies’ resilience should be based and with which it should be enhanced. It seems that roads hitherto less travelled should now be followed, and new forms of governance, management and integration of different aspects of life should be put to the test.

Fig 5.13 Fishermen and a pelican in Greater Prespa on a cold winter day.

References
Berkes, F. (2003), Rethinking community-based conservation, Conservation Biology, 18 (3), 621-630.


5.3 Spirituality and belief systems

Most of the great civilisations around the Mediterranean Sea have been associated with mainstream religions which have played a definitive spiritual, social, cultural and political role in their development. All of these religions have espoused the sanctity of water in one way or another, and, therefore, of places related to water, such as sources, streams, lakes and marshes.

The Ancient Greek civilisation and the religion of the Dodecatheon provide a characteristic example (Papayannis, 1992). In their imaginative pantheon of gods, demigods and heroes, the Greeks included deities devoted to nature and the aquatic environment.

Artemis was the primary goddess, the protectress of animals and nature, but also a huntress. The Artemis Orthia temple in Sparta was one of its oldest sanctuaries; also called the Limnaion, it was a place where Artemis Limnaia, the Lady of the Lake, was revered. Lake Stymphalia –well-known from the labours of Hercules– was also a place where Artemis was venerated.

Poseidon was the god of the sea, but also of all wet elements. His residence was considered to be the bed of the Alphios River. By turns both benevolent and destructive, he gave gifts of freshwater sources when pleased with mortals, or caused floods and droughts when annoyed, as happened on the Plain of Argos. To punish the inhabitants of Troizena, he irrigated their fields with salt water and made the land infertile.

Fig 5.15 Hercules wrestling the river-god Acheloos, 520 BC, London, British Museum.

18 The Dodecatheon, the traditional polytheistic Greek religion, centres on twelve gods with Mount Olympus as their seat.
Rivers were also considered sacred, and sometimes personified; the Acheloos was thus depicted with the body of a snake and the head of a bull. Nymphs were daughters of the river gods and –the Naiads, especially– were considered goddesses of water sources and streams. The Nereids in turn were revered in special sacred places related to saltwater bodies. These nymphs of the sea were considered to be friendly entities, always ready to help sailors in rough seas. The hero Hercules killed the birds in Lake Stymphalia and the Hydra in the Lerne swamps. He cleaned the stables of Avgias by diverting the flow of the Alphios and Pinios Rivers through them, in an act which perhaps prefigured contemporary river diversion schemes.

**Ramsar Guidance**

In the contemporary context, many of the sacred natural sites around the Mediterranean have been incorporated into natural protected areas. These include iconic sites such as Mount Athos in Greece and the Montserrat Monastery in Spain, both of which are recognised as World Heritage Properties, as well as the Doñana wetlands in Andalucia, Spain. The results can be positive; in certain cases, however, conflicts have emerged between the custodians of sacred sites and the managers of protected areas. With mainstream faiths, these conflicts are usually dealt with in a context of balance and equanimity, but this is often not the case when they concern the spiritual beliefs of indigenous peoples (Mallarach and Papayannis, 2008). Thus, the Ramsar Guidance encourages cooperation between the two sides in a spirit of mutual understanding and respect (Ramsar Guidance, p. 61).

O.4.3.1 – To encourage co-operation between wetland managers and the custodians of sacred natural sites

To achieve co-operation, the following actions are proposed:

a) recognise officially the sacred character of specific natural elements and the inherent rights associated with them;

b) invite the custodians of sacred natural sites to participate in the preparation, approval and implementation of management plans for relevant protected areas;

c) invite these custodians to participate in an equitable manner in the management bodies of these protected areas; and

d) establish consultation mechanisms among the different sides in order to resolve amicably emerging issues of conflicting land uses and practices.
The most important and far-reaching part of this guidance is the strong recommendation to involve the custodians of sacred natural sites in the management of the corresponding protected areas, both in the planning process and in the operation of management bodies. This is exactly the same advice that has been promoted by the IUCN’s Delos Initiative on sacred natural sites in developed countries\(^\text{19}\).

The Ramsar Guidance also recognises the potential contribution of spiritual beliefs to nature and conservation, and proposes that this contribution be strengthened by specific actions, so that synergy between the two can be established (Ramsar Guidance, p. 62).

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**O.4.3.3 –**

To take into account wetland-related spiritual belief systems and mythologies in efforts to conserve wetlands

The following actions may be required:

a) study in detail for each religion the belief and mythological system, its links with nature, water and wetland resources, drawing on the active participation of religious institutions and leaders, and the custodians and practitioners of the belief and mythological systems in indigenous and local communities;

b) use this knowledge to present the conservation and sustainable use message in appropriate forms; and

c) work with churches and/or religious leaders and appropriate members of indigenous and local communities so as to encourage them to convey these messages and to participate actively in the efforts for environmental conservation as an integral part of respectful management of the Creation.

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The Ramsar Convention has not yet advanced substantially in the implementation of the above objective. Other multilateral agreements and international non-governmental organisations have been more active in this field. Besides the IUCN Delos Initiative mentioned above, UNESCO and the Convention on Biological Diversity have both promoted an integrated approach to spiritual heritage, as have WWF International and the Alliance of Religions and Conservation.

The crux of all these efforts is an attempt to achieve an equitable balance between conservation requirements and respect for the spiritual concerns of the custodians of sacred sites, and to ensure an active role for contemporary churches in wetland management and wise use as part of their respect for Creation.

\(^{19}\) The Delos Initiative has been developed since 2003 in the framework of IUCN/WCPA and its Specialist Group on the Cultural and Spiritual Values of Protected Areas (www.medi-ina.org/delos.)
Three Mediterranean perspectives

The first paper in this section, written by Josep-Maria Mallarach, illustrates the spiritual and religious values of northern Mediterranean wetlands. The historical background is described, together with the relevant associations between pre-Christian and Christian sacred sites. The governance and custodianship of these sites are rather diverse, and this is reflected in the three case studies examined, which are located in Spain, France and Albania/Montenegro respectively. Secular and religious traditions in the Mediterranean are both threatened by globalisation and rapid development. Re-examining them in a contemporary context and reinforcing their ecological links could be of benefit for the conservation of the area’s natural, cultural and spiritual heritage.

On the southern shores of the Mediterranean, Islam is the dominant religion. The special role of water and the importance of environmental protection are central to the traditions associated with this religion, and this should be taken into account in relevant management practices. More specifically, Islamic traditions can be successfully implemented to achieve environmental sustainability and conservation goals, as in the case of the traditional resource management systems which the MedWet Co-ordinator, Nejib Benessaiah, describes in his paper. Benessaiah also stresses the importance for efficient environmental management of taking people’s religious and cultural values into account, and illustrates how these values can be used to support the wiser use of wetland resources.

The Hima is a traditional, community-based approach to nature conservation which has its roots in the needs of the inhabitants of harsh environments with limited natural resources. It was first developed in the Arabian Peninsula 1500 years ago and evolved in tandem with Islam, which enriched it with the values of equity, the distribution of benefits, common goods and participatory decisions. The Society for the Protection of Nature in Lebanon (SPNL) is attempting to revive this practice in a challenging contemporary environment. The authors of the paper on this subject are affiliated with SPNL, and provide an overview of the Hima approach and its potential.
Spiritual and religious values of northern Mediterranean wetlands: challenges and opportunities for conservation

Josep-Maria Mallarach

Abstract
This paper explores the historical background to the sacred dimensions of nature in northern Mediterranean wetlands. It goes on to discuss the Christian approach to the sanctity of nature, and the diverse relationships that have emerged over time between Christian and pre-Christian Sacred Natural Sites (SNSs). The current situation is then examined by means of three case studies of projects in France, Montenegro and Spain respectively, followed by examples from other wetlands of international significance. All these examples show the growing difficulty of conserving the natural, cultural and spiritual heritage of these fragile wetlands under the pressures of mass tourism, development, cultural homogenisation, secularisation and the impact of climate change. The conclusions focus on the opportunities for fostering a holistic approach to heritage conservation by integrating the religious and spiritual dimensions of wetlands that have largely been neglected by protected area managers.

Keywords: Wetlands, Mediterranean, sacred natural sites, Christianity, religion, management

Religions and wisdoms are as natural —although in a supernatural mode— as the air we breathe, the water we drink and the food we eat. Not to acknowledge the ‘categorical imperative’ of what could be said to be a ‘spiritual ecology’ is as destructive as it is unrealistic.

Frithjof Schuon.

Introduction and historical background
It has been said that ‘many of the cultural values of wetlands are non-material in essence, relating instead to traditions and beliefs with spiritual or secular implications, to knowledge and education, to personal or social entertainment and pleasure’ (Papayannis, 2008). This paper discusses a sub-set of these non-material values, namely the spiritual and religious values associated with some northern Mediterranean wetlands from historical times into the present day, exploring the opportunities the inclusion of these values may bring to a holistic approach for conservation in the face of growing current threats and challenges.
Spiritual values are pervasive in most Mediterranean wetlands for the simple reason that all the known civilisations – both prehistoric and historic – that have developed around this sea have been imbued with a profound sense of the sacred which has manifested itself in a diversity of religions and beliefs in which nature has always played a significant role. Only during the last two centuries or so has this resilient feature declined, due to the impact of a materialistic and secularised mindset which has been experienced at different intensities and at different times in every Mediterranean country; indeed, some remote areas have only experienced it in recent decades. A total absence of spiritual connections with wetlands is found only in regions with no record of any human presence, usually because these regions had been avoided as a result of cultural or religious taboos which are often linked to the presence of disease vectors.

From the beginning of historical time, ancient religions with close ties to nature have stretched from one shore of the Mediterranean to the other. One of the most important and best known is the religion of ancient Egypt, which supported the most resilient historical sedentary civilisation in the region. Temples dedicated to diverse Egyptian deities have been found on numerous parts of the Mediterranean coast. For example, a temple dedicated to the god Ra was built in the wetlands of the Rhône delta during the sixth century BC (Colinon, 2001), while another temple dedicated to Isis was built in Emporion, a Greek settlement surrounded by the estuaries of the Ter and Fluvià rivers in what are now known as the Empordà wetlands, during the fourth century BC (Ruiz i Vivó, 2007).

From the sixth century BC on, the Greek religion spread along the northern coasts and the Phoenician religion along the southern coasts of the Mediterranean. Within a few decades, a number of Mediterranean wetlands had been consecrated to the new deities of these religions20. For instance, it is documented that the cult of the goddess Artemis (a virgin, protector of pristine nature and wildlife) was spread by Phoenician maritime expeditions guided by oracles and priestesses of the main temple dedicated to the goddess in Ephesus. As a result, temples devoted to Artemis (the equivalent to Diana in Roman times) were built in various locations, such as the small islands of Saint-Maries-de-la-Mer in the Rhône Delta, and Paleopolis on the estuary of the Fluvià River in the north-eastern Iberian peninsula. In the latter case, the settlement built on the shores of the Empordà marshes had two additional temples which were also built during the sixth century BC and attracted pilgrims from many Mediterranean countries who hoped to be healed of diseases (Carreras and Sáez, 2007). Interestingly enough, it has recently been proven that the large figure of Asklepios venerated in Emporion was sculpted on the sacred island of Delos in the Aegean sea and then transported to the western Mediterranean (Schröder, 2007) in yet another instance of the religious influences that have spread throughout the Mediterranean for almost three millennia.

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20 In many of the ancient Mediterranean religions, gods and goddesses had similar roles to those played by the devas in Hinduism, or angelic beings in the three monotheistic religions.
Although exactly how these ancient sacred sites affected nearby wetlands is not documented, it can be assumed that their sacred character inspired greater respect—and ultimately better protection—for the natural environment in general (Nasr, 1989).

The Christian approach to the sanctity of nature, and its relationship to pre-Christina sacred sites

From the Roman province of Judaea, Christianity spread through the Roman Empire, mainly along the coasts of the Mediterranean basin, during the first century of the Christian era. However, the impact of this new religion remained limited until the reign of Constantine the Great, the first Christian Roman emperor, who issued the ‘Edict of Milan’, which declared religious tolerance, in 313 AD. From that time onwards, Christianity spread through the Mediterranean and beyond, usually to areas where a diversity of ancient religions and spiritual traditions existed with differing degrees of vitality and integrity. This was the case with the Egyptian, Greek and Roman spiritual traditions.

All the pre-Christian religions of the Mediterranean basin, from the Etruscan or the Megalithic to the Greek or Egyptian, contributed to the establishment of a vast number of Sacred Natural Sites, many of which continued to be used by the ancient religions for centuries after the establishment of Christianity, especially in or near remote wetlands both inland and coastal. Over the centuries, the Christianisation of the SNSs of older religions was a frequent phenomenon. This reuse of existing shrines and temples, buildings and monasteries, was achieved by several methods, sometimes coming about in a gentle, ‘organic’ manner when the old faiths or cults were already in decline or when they could be easily integrated, and sometimes being forcibly imposed for various, often political, reasons by the religious or political authorities. In many cases, numerous pre-Christian rituals were tolerated in certain places, and were usually accepted by Christian authorities as folk religion.

From the ninth to the eleventh century AD, Christianity in the Mediterranean split into two branches: the Eastern (Orthodox) and Western (Latin or Roman). The essence of the theology of nature gradually began to differ between the two, and diverse nuances in the relationship between humans and nature slowly developed. The Latin and the Orthodox approaches to the sanctity or holiness of natural sites in Christianity share common principles, such as the intrinsic virtuousness of nature and all beings, and the role of humans as stewards. Nevertheless, some differences are evident, the most important being the widely accepted use of the concept of the sacredness of nature in the Eastern tradition, while the Latin tradition prefers to refer to the ‘holiness’ of specific sites (Hessel and Ruether, 2000).

According to Christian beliefs, the lives and deeds of holy, or deified, men or women have a direct beneficial impact not only on other human beings, but also on all living creatures and on matter as well as the objects or places around them.
This is why the role of relics is so important in the spiritual economy of both Christian traditions. Consequently, the sites where saints lived, their tombs, or the places where their relics are venerated are also considered to be sanctified. A special case is that of important saints who lived in a close relationship with nature, such as Saint Francis of Assisi (in Tuscany) or Saint Serafin of Sarov (in Russia).

Christian monasticism and hermitism began to develop in the fourth century AD in the deserts of Egypt, and spread to the entire Mediterranean basin during subsequent centuries. Monasteries are places where monks or nuns devote most of their time to prayer and meditation, only doing chores to support themselves in a sober, self-sufficient lifestyle. All monastic communities live their lives following rules established by their founders, and usually have resilient democratic governance systems. The most influential rules for the Eastern Christian and Latin traditions were those laid down, respectively, by Saint Basil in the fourth century AD and Saint Benedict in the sixth. Monasteries and monastic communities are usually revered, and by extension, monastic properties are considered sanctified by the presence and work of monastic communities down the ages.

Hermits are often linked to monastic communities. Hermits are men or women who live close to nature, usually in simple huts or in caves. They choose to live a simple life in physical isolation from human beings, although in a constant state of meditation, prayer, and ‘communion’ with all living beings which implies a profound harmony with nature. For these reasons, hermitages or hermit domains are also generally considered sanctified. Hermitism has been an important element of Christianity though the centuries, and is still highly revered in the Middle East and Eastern Europe, as well as in the heavily secularised countrie of Western European, which have experienced a significant revival in hermitism over the past three decades. It is worth noting that many hermits currently live within protected areas in France (Muirzson, 2001).

Sanctuaries or shrines have been built in places where miracles have taken place, and these often attract groups of pilgrims. When such events have occurred in natural areas, another type of sacred natural site has often been established, in which people as well as wildlife can find refuge; in some countries, these areas have a definite ‘sacred’ or ‘buffer’ area around them. Miracles often consist of celestial apparitions, usually of the Holy Virgin and/or angels. Since these epiphanies usually happen in natural places, the site—be it a wetland, cave, spring or river—tends henceforth to be considered sacred, holy, or sanctified, along with its surroundings. With its miraculous spring water, Lourdes in the Pyrenees, to which millions of pilgrims flock every year, is one such case.

Another feature of the relationship between Christianity and nature is the pilgrimage routes or trails which pass through a number of sacred places, often SNSs, on

their way to significant shrines or sacred sites. Some routes or trails are short, but the great majority of pilgrims travel hundreds or even thousands of kilometres on these journeys. Some pilgrimage routes are of local or regional significance, whilst others are of national or international importance. The Saint James Way (Camino de Santiago in Spanish) is currently the oldest established pilgrimage route in Europe. Established during the eleventh century AD and enjoying a golden age that lasted four centuries, pilgrimages along this route have experienced a significant revival in recent decades, fostering the development of numerous protected areas and nature and landscape restoration projects, as well as the declaration of several Biosphere Reserves in northern Spain (Mallarach, 2005). The Camino de Santiago was the first Cultural Itinerary of Europe declared by the Council of Europe in 1987, and was made a World Heritage Site in 1993. One of the branches of the route follows part of the Mediterranean coast, with a significant stage going through the wetlands of the Camargue. Another pilgrimage route is the Via Lauretana, an historically important route in Italy which also passes through a number of wetlands, such as Colfiorito (Serenelli, 2010).

Management of Christian Sacred Natural Sites

The diversity of Christian SNSs is matched by a corresponding variety in models of governance and custodianship. Perhaps the main distinction to be made is that between sites managed by lay organisations, such as Christian brotherhoods or local communities, and those managed by religious organisations. Regarding the latter, another significant distinction should be made between SNSs managed by monastic communities and those managed by others. By contrast with the Orthodox Church, a number of monastic orders have developed within the Latin Church, leading to a diversity of management approaches. From the thirteenth to the eighteenth centuries, the Cistercians were probably the monastic order most actively involved in wetland management in Western Europe. In general, natural properties looked after by monastic communities have tended to be more carefully managed than those looked after by lay organisations. Monastic communities are also more likely to implement restrictions aimed at protecting silence and tranquillity as prerequisites for experiencing the sacred.

In general, custodians of sacred or holy sites and managers of protected areas have very different world-views. While the first tend to believe that their long history and the fact that they care for sacred values gives them precedence over newcomers, the managers, who are usually trained in modern management techniques, tend to disregard the old ways and believe in the superiority of modern scientific approaches to conservation. In many cases, parallel strategies for nature and spiritual heritage conservation and promotion are developed, with little or no dialogue among the stakeholders. In the worse cases, tensions appear. There are very few examples of frank and in-depth cooperation. As a result of the
general trend towards secularisation, the remaining custodians of Christian SNSs in the northern Mediterranean are increasingly isolated and often feel marginalised, sometimes even within their own religious institutions. A number of significant best practices have been developed, especially in monastic communities, but these now need to be acknowledged and disseminated more widely (Mallarach, in press).

Case studies

Three case studies will be briefly described which illustrate the significance and diversity of religious values in northern Mediterranean wetlands. Each case demonstrates different challenges and opportunities for conserving the integrity of the rich heritage at stake. Given that all three are well-known wetlands of international importance, their natural values are not described here.

**Doñana wetlands, Spain: worshipping the Queen of the Marshes**

The wetland complex of Doñana, located at the estuary of the Guadalquivir River in south-western Spain, is one of the most important wetland complexes in western Europe. The core area is legally protected as part of the Doñana National Park (IUCN category II) established in 1969, and the area around the core is protected as part of the Natural Park (IUCN category V) established in 1989. Together, both parks encompass over 140 000 ha. The relationship between the park managers and the local population has never been fully satisfactory, as a lack of mutual understanding has separated them from the start.

The religious significance of Doñana relates to the worship of Nuestra Señora del Rocío (Our Lady of the Dew), who is known locally as the ‘Queen of the Marshes’ or ‘The White Dove’. Pilgrimages and a variety of traditional rituals and religious ceremonies have been celebrated at this site in honour of the Virgin since the fourteenth century AD. The organisations responsible for the pilgrimages include over 100 brotherhoods (hermandades) and the Almonte Town Council. In recent times, some pilgrimages have become larger in scale and acquired a more festive character, and a sense of unease has spread among the brotherhoods because of a perceived trivialisation of the religious celebrations.

The activities connected with the worship of the Virgin del Rocío take place throughout the year: the Pentecostal Pilgrimage, which is one of the largest in Europe and attracts hundreds of thousands of people; the *Rocío Chico*, a smaller local pilgrimage; yearly pilgrimages by all brotherhoods; the Festival of Light and the traditional individual pilgrimages that continue throughout the year. Pilgrimages on foot and by horse-drawn cart use four main routes and may have negative effects such as disturbing fauna, contamination, accumulating rubbish; over-sized vehicles can also sometimes cause damage. These impacts are getting worse, due to an increase in the number of participants and a deterioration in their behaviour –
a fact deplored by the organisers. At the same time, the pilgrimage routes are also negatively affected by aspects of the regulations set by the Parks’ managers.

Visitors to Doñana are in favour of preserving the area’s natural values, although most of them do not fully comprehend and appreciate the natural heritage that makes the wetland so unique, and are unaware of the socio-economic and cultural repercussions the pilgrimage activities have on the local population. The local population is reasonably aware of the uniqueness of Doñana’s natural values, and feel that it is part of their lives, although they are generally less aware of the fragility of the familiar natural elements that form part of their surroundings.

However, there are other threats to Doñana with potentially more significant impacts than those arising from religious practices. These relate to large-scale industry, mining, intensive agriculture, irrigation schemes and urban development that have been taking place around the protected areas and within the water catchment area. For instance, the greatest single ecological impact was a massive spill of highly toxic liquid waste from an upstream mining operation in 1998. The increased urbanisation of the coast, partly as a result of intensive tourism both inside and outside the protected areas, increases erosion, the silting up of the marshes, the alteration and fragmentation of habitats, water pollution and over-abstraction from the aquifer.

To overcome the inherent difficulties in the relationship between Doñana Protected Areas managers and El Rocío pilgrimages, the main stakeholders need to acknowledge that these problems are part of a long-term dynamic process which requires sustainable policies of awareness based on mutual respect and cooperation. The Common Manifesto agreed between the main stakeholders in 2003 was a good starting point for an integrated vision shared by all the parties involved. The Delos case...
study (Falgarona and García Varela, 2007) recommended that sanctuary status be extended to the entire area of the marshes, which are seen both as the home of the Virgin and as a fragile natural ecosystem. The establishment of a permanent co-ordinating body that would embrace every institution with an important role to play in the management of the heritage of the Doñana wetlands and El Rocío sanctuary and pilgrimage trails was also proposed. This co-ordinating body could develop or promote a strategic plan to foster an understanding of the spiritual dimension of nature and its relevance to the worship of the Virgin; raise environmental awareness on the part of all the relevant institutions and public services and facilitate a fruitful discourse on the moral and ethical compatibility between such attitudes and religious values. By the same token, the brotherhoods could promote the recognition of pilgrimages as strictly religious acts, discourage incompatible practices and include environmental awareness –targeted especially at their younger members– amongst their social activities.

Finally, the managers of the protected areas of Doñana should recognise the intrinsic value of the worship of the Virgin of El Rocío, the related religious manifestations (such as processions, devotional songs, dances, etc.), and the interdependence of the values inherent in nature protection. Both sets of values, as well as the public land and resource uses they imply, must therefore be integrated in management plans, acknowledging the connections between the marshes and the Sanctuary and its devotees as interconnected aspects of a very fragile ecological system.

The Camargue wetlands, France, and the Romani pilgrimage

The Rhône Delta includes some of the largest, most diverse and well-known Mediterranean wetlands. A Ramsar Site since 1971, most of the western lobe is protected by the Natural Regional Park of the Camargue (IUCN Category V) established in 1970 in agreement with the four municipalities sharing this amazing working landscape. The core area is included in two public nature reserves and one large private nature reserve: La Tour du Valat (IUCN Category III).
Like other major Mediterranean wetlands, the Camargue has included several SNSs down the ages. This case study focuses on Saintes-Maries-de-la-Mer, which is located on a narrow sand-bar at the front of the delta, and has been one of the holiest places in the region for over 25 centuries. The site has records and remnants of Egyptian, Greek, probably Roman, and Christian temples. Christianity spread to the rest of Gaul from this site in the first century AD, having been brought there by three women: Mary Salome, Mary Magdalene –disciples of Jesus– and Sara, her servant. A spring of pure drinkable water was found at the spot where they arrived, which was considered a miracle, since it is located only a few metres from the sea. A small chapel was built over the sacred spring in the second century AD. Forgotten for generations, the chapel was rediscovered in the tenth century AD, and the Romanesque fortified chapel which now houses the relics of the sainted women was later built on the site. The place was called Lei Santas, or Lei Santei Marias de la Mar in Provençal, meaning ‘Saint Marys of the Sea’ (Gayte, 2009).

In the eleventh century AD, this sacred site was linked to one of the branches of the Santiago de Compostela pilgrimage route (Gayte, 2009). During that period, Saintes-Maries-de-la-Mer itself became a pilgrimage centre which was unique, from the fifteenth century onwards, in attracting not only local people (in quite limited numbers at that time), but also nomadic Romani from the region and beyond. The link between the Romani and this site is based on the belief that Saint Sara was an Egyptian Romani. Sara was considered the patroness of the Romani and became the central focus of their devotions (Colindon, 2001). During the nineteenth century, these pilgrimages acquired new secular values in addition to the original religious values.

Three pilgrimages to Saintes Maries are organised annually. The most important and most colourful is that held on May 24-25: the Romani pilgrimage. For the tens of thousands of Romani participating in the event, it has a profound religious, cultural and identity-based significance. During the pilgrimage, baptisms take place and religious catechism is given to children during the ten days prior

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**Fig. 5.18** Traditional shelter in the Camargue wetlands; in the background, the shrine of Saintes-Maries-de-la-Mer.
to May 24, with Romani families camping around the village, often with inadequate facilities. Special devotional songs, dances and processions have been developed over the years, inspired by the pilgrimage.

Saintes-Maries-de-la-Mer, a municipality of approximately 2500 inhabitants, is mainly supported by tourism and to a lesser degree by fishing. In recent decades, the Town Council has promoted urban expansion and tourism development, and not always adequately respected the fragile natural heritage that surrounds the village, and the equally fragile spiritual and cultural heritage relating to the shrine and its pilgrimages. With the support of the Archbishop of Aix-en-Provence, the main lay organisation responsible for the pilgrimages is struggling to improve the current situation, and to keep the authenticity and religious atmosphere of the pilgrimages from being eroded by the pressures of tourism (D. Charmaison, pers. comm., 2009).

Fig. 5.19 Fortified shrine of Saintes-Maires-de-la-Mer, view from the wetlands.

The main threats to the integrity of the Camargue’s complex of ecosystems and landscapes relate to numerous, changing and sometimes conflicting economic interests, specially large-scale agriculture and tourism (Mathevet, 2004) which – again– have little if any connection with religious values. However, the impact of global climate change, especially rising sea-levels and increased coastal erosion, may prove a greater threat. The potential to include the significant spiritual and religious values of this part of the protected area in its planning and management, and thus broaden popular support for its conservation, seems largely unexplored.

Lake Skadar, Montenegro and Albania: a spiritual, cultural and historical ‘heart’

Lake Skadar, which is now shared between Montenegro and Albania, is the largest open water body surface in the Balkan Peninsula. It is separated from the
Mediterranean coast by the Rumija mountain range. It was declared a Ramsar site in 1996 and is managed as such. The Montenegrin part of the Lake was declared a National Park in 1983.

The lake, which is also called Scutari / Shkoder in the local languages, is characterised by beautiful landscapes, picturesque villages, medieval towns and fortresses, and by its rich natural, religious, historical and cultural heritage. The area was the political and spiritual heart of the Montenegrin kingdom during the Middle Ages, and numerous Christian monasteries, churches and holy monuments are found on the lake’s islands. In the old capital of the Montenegrin kingdom, Obod, which is now the little town of Rijeka Crnojevica, the first printing press in this part of Europe for books in the Cyrillic alphabet was established in 1494. The previous capital was Zablak, which is also situated on Skadar Lake.

The religious heritage of the Skadar Lake region includes Christian Orthodox monasteries, several scattered holy monuments, and Mount Rumija, to whose peak a religious procession makes its way every year.

Although the first monasteries were founded during the eleventh century AD, the golden area of monasticism was during the fourteenth and fifteenth centuries AD, when some 20 monasteries were built around the lake or on its islands. This is why the area was called the Mount Athos of Zeta. After decline and abandonment, some of these monasteries have recently been reconstructed, and five of them currently host monastic communities: Beska, Kom, Moracnik, St. Nicola (Vranjina) and Stracevo.

Significant religious celebrations called slava are held in all these monasteries, attracting the faithful from different parts of Montenegro, Serbia, Bosnia and beyond, including overseas countries. A Krsna Slava is the celebration of the family patron-saint—the greatest feature of the national and religious life of the Mont-

Fig. 5.20 Skadar Lake on the Montenegrin-Albanian border.
the families, every Serbian monastery and many communities celebrate their own patron saint.

The holy monuments, another feature of the religious heritage of the region, include numerous village burial churches in the coastal region of the lake. These are usually autonomous buildings with bell towers erected in their centre, and were built between the fourteenth and the nineteenth centuries. These churches include Sveti Nikola in Mataguzi, Sveti Djordje in Berislavci, Sveti Luka in Gostilje, Sveti Petka in Golubovici, Sveti Dimitrije in Bijelo Polje, Sveti Ilije in Ponari, Sveti Petka in Kurilo, Svete Trojice in Vukovci and Sveti Nikola in Obod.

‘Rumija’ means ‘Christian’ in both Arabic and Turkish. Once a year, during the Feast of the Holy Trinity, an important procession with Christian Orthodox, Catholic and Muslim participation takes place, climbing to the top of Mount Rumija (1593 m high) and arriving at sunrise at the spot where it is believed a church once stood. The crowd carries the holy cross of Duke Vladimir (980-1016 AD, canonised as a saint), which has been kept in the Androvic family for centuries as a sacred relic. Only the two oldest members of the family know where this cross is hidden during the rest of the year. Each participant in the procession carries a stone to the top, and it is believed that the church will rebuild itself when enough stones are gathered there.

The spiritual and cultural values related to the site contribute to the conservation of its heritage values in two ways: some monasteries were recently reconstructed after centuries of being abandoned, and monastic life is now recovering with monks living in harmony with nature; in addition, the traditional gathering of the faithful during religious festivities, as well as religious tourism, have become strengthened. These trends are indirectly positive, as local people come to realise more and more that the natural, cultural and religious heritage of the area is a vital asset for them in both cultural and economic terms.

However, other human activities have a considerable impact on the Skadar Lake ecosystem, either directly (irrigation and drainage schemes, poaching, overfishing, etc.) or indirectly (poor waste water management of certain large towns, illegal landfills, etc.) Aluminium production facilities in Podgorica have a negative impact on the river Moraca, which feeds Lake Skadar.

Other wetlands with significant spiritual values

There are many other Ramsar sites in the northern Mediterranean countries, which have religious and spiritual values that are significant for local populations. The following examples are purely illustrative.

In the Albufera de València, a coastal lagoon in Spain, there is a famous liturgy performed on boats. Established in 1974 and relating to the blessing of the waters and to primary productive activities, it takes place on August 4 each year. Crist
de la Salut’ [Christ of Health], an image of Christ on the cross carried on a boat, leads a procession of hundreds of boats that heads into the centre of the lagoon. This tradition has increased awareness and respect among the local population, but unfortunately has had little impact so far in reducing the main threats and pressures from peripheral intensive agriculture and the growth of Valencia, a nearby city of more than one million people (Vives & Salathé, 2006). A similar case is that of Santo André lagoon in Portugal, where several religious processions are organised throughout the year, including the ceremony of ‘linking the lagoon to the sea’, the worship of St Andrew and St Peter, and the Santo André fair (Paula E. Silva, quoted in Papayannis, 2008); the site faces significant threats related to pressures around its periphery and catchment area. Numerous inland lakes include Christian sacred sites on their shores or islands. For instance, Lago di Sabaudia in Italy includes the significant twelfth-century shrine of Santa Maria de la Sorresca. Finally, the Po Delta in Italy includes a number of SNSs clearly acknowledged over the ages by its place names, such as Valle Santa (Holy Valley), Lagosanto (Holy Lake) and the via Romea, an ancient pilgrimage route to Rome, plus many more with temples and monasteries like the abbey of Pomposa.

Discussion

It is true that the cultural values of Mediterranean wetlands ‘seem to be shifting from the traditional methods of resource use, which are being rapidly abandoned, to a growing interest in spiritual and social aspects’ (Papayannis, 2008); however, most of these social values relate to tourism or recreation. The Mediterranean basin is currently the world’s pre-eminent tourist destination. According to the World Tourist Organisation, with an annual growth of 3%, it may reach 345 million tourists per annum by 2020 if current trends continue (UNWTO, 2008). Nonetheless, the intangible heritage and the spiritual and religious values of certain Mediterranean wetlands are still significant. Normally, these values relate to the presence of historically important shrines, monasteries or hermitages which are often connected by significant pilgrimage routes.

In recent decades, modern protected areas in ancient SNSs relating to wetlands have been established which show little sensitivity for local traditions, custodians and local practices related to religious and spiritual heritage, and have created diverse types of conflicts. The potential for co-operation and the development of synergies between the managers of protected areas and the authorities in charge of the local natural, cultural and spiritual heritage therefore remains an opportunity to explore and develop. It seems that only in a very few cases, such as that of Doñana-Rocío, has a thorough analysis been carried out and a specific strategy proposed which fosters the positive synergies required (Falgarona and García-Varela, 2007).

That said, the negative impact of large-scale pilgrimages on the integrity of wetland natural values is a matter for concern in only a very few cases. For most
wetlands, taking into account their spiritual and religious values has resulted in increased respect for the ecological integrity of these sites by local populations.

In fact the most serious pressures and threats these wetlands face relate to their catchment and to the development of large-scale regional or national projects which are not inspired by Christian values and principles— to say the least— but are based on crude materialistic criteria such as maximising profits in the short term and fail to take the intrinsic values of nature, and a respect for all species, into consideration. Moreover, threats related to global climate change are already apparent, creating new and unexpected challenges.

Because of the rapid changes related to mass tourism, urbanisation and industrialisation, traditional culture and local religious traditions are under threat and weakening in most Mediterranean countries. Reinterpreting religious traditions in their current context, facing contemporary challenges and identifying links between spiritual traditions and nature conservation therefore seems a priority for conserving the natural, cultural and spiritual heritage. This will require the development of new communication and awareness strategies using more holistic approaches based on religious ethics and intrinsic values, and using arts-based language which may convey messages that scientific descriptions cannot. It will also require the promotion of honest cooperation at all possible levels and sectors—and between the custodians of sacred sites— to foster eco-justice, social and ecological integrity, and coherence between principles, words and actions. Under ever-increasing threats, sacred values and other intrinsic values may often make the difference in cases of conflicts between values (Smith, 2001), since the loss of the sense of the sacred is strongly related to ecological deterioration both locally and globally (Nasr, 1989).

References


22 As summarised, for instance, in the ‘Ten Commandments for the Environment’ announced by the Catholic Church in 2010.


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Wetlands and the Islamic perception of nature

Nejib Benessaiah

Abstract
Islam is the main religion in the southern Mediterranean, and for this reason it is important for the Mediterranean Wetlands Initiative and any other organisation working towards the conservation of natural resources, to examine its perspectives, principles and laws concerning the environment. A better understanding of Islamic traditions can lead to more effective, locally-tailored plans for the conservation of water and wetlands. Water is a central theme in the Qur’an, in religious practice, in Islamic Law –Shari’a– and in Islamic society at large. Each of these aspects is examined in this paper and analysed according to the four main pillars under which environmental protection can be understood in Islam. Traditional resource management systems like the Hima, Haram and Waqf which provide people with specific instruction on how to use natural resources are also discussed. Particular attention is given to the oases, a characteristic type of wetland in the southern Mediterranean region, and to their water management system in particular, which reflects not only the religious teachings of Islam but also the essence of wise use of water. Effective management of natural resources needs to take into consideration the religious background and cultural values of the population and the site in question. In the case of wetlands in the southern Mediterranean region, they often have religious significance through their connection with saints, for example the Bahiret el Bibane and Ghar El Melh lagoons in Tunisia. This provides wetland managers and conservation authorities with the opportunity to utilise this religious and cultural significance to promote the wiser use of the wetland. This can then become a tool to involve the local population by reinforcing a feeling of connection and greater personal responsibility as well as promoting ecological and cultural tourism.

Keywords: Islam, wetlands, water, wetland management, saints

Introduction
Islam emerged in the context of extreme water scarcity, and hence water is a central theme in the Qur’an, in religious practice, in Islamic Law –Shari’a– and in Islamic society at large. The Qur’an states that God made water the basis and the origin of life, so plants, animals and humans all depend on it for their existence. In religious practice, it symbolises resurrection and purification and in the Shari’a specific prescriptions for water use rights are given and the role of hu-
mankind in managing and preserving this resource is described. The oases, man-
made wetlands found in the southern Mediterranean, provide the best example
of sustainable water use influenced by Islamic tradition and law.

The perspective of Islam concerning environmental protection is based on four
main ‘pillars’ of the Creator’s teachings about Man and his role on Earth. The first
such pillar is proportion and measure: the idea of balance and the creation of all
things in due proportion and measure by God. Nothing is created without pur-
pose, and everything is interrelated. The second pillar is the belief that Man has
a specific place in the universe defined through his consciousness and contem-
plation of what the universe is, through showing care and generosity to all creat-
ed beings and through the sustainable use of the universe’s resources. The third
pillar is Khilafah, the belief that Man has a stewardship role on the Earth: he is a
manager of the Earth and not a proprietor. God has given Man the power to man-
age the Earth according to his own purposes for his own benefit and that of all
created beings. Finally, the fourth pillar concerns development and conserva-
tion, whereby it is Man’s religious obligation to utilise natural resources without
negatively affecting the interests of future generations.

Wetlands in the southern Mediterranean are often associated with saints and are
rich in religious traditions. This could be used to involve the local population,
who are often attached to their religion, in the conservation of wetlands by mak-
ing this a moral and ethical issue. Furthermore, religious associations in wetland
sites could be used to promote sustainable ecological and cultural tourist activi-
ties, which could provide extra income for the inhabitants as well as an increased
desire to protect the natural environment.

The role of water in Islam

The prominent role of water in Islam is not surprising. Islam was born in a con-
text of great water scarcity in the Arabian Peninsula, and it spread to other arid
and semi-arid regions of the world. Water is considered vital and sacred; it is the
central element of all life in all ecosystems. It can be examined in terms of the
Qur’an’s prescriptions, religious practice, the Islamic Canonic Law (Shari’a) and,
finally, in terms of its impact on society.

In the Qur’an, the word ‘water’ is repeated over sixty times, and thus is a central
theme in Islamic cosmogony and religious practice. In fact the Sura23 of the Proph-
ets states that ‘We made from water every living thing’ (Chap 21/Verse 30), hence
plants, animals and humans were all created from, and depend on, water for their
existence. Water has both a symbolic and a practical significance in Islam. As a
symbol, it signifies both resurrection and purification. Concerning the former, para-
dise is described as a water-rich environment with flowing rivers and lush vegeta-

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23 Sura: chapter of the Qur’an; plural: Surates.
tion, while the latter is exemplified through the ablutions the believer needs to make before the daily rituals in order to become purified. The Qur’an states that water was sent by God for human survival, and that the seas and rivers were created to be used by people for transportation (Haddad, 2001). The religious prescriptions concerning water use in Islam, however, come from the Shari’a, which gives specific instructions stating that the sequence of priorities among water use rights is first for humans to quench their thirst (haq al shafa or shirb), then for cattle and animals to do the same (haq al shafa), and then for use in irrigation (Mallat, 1995). Concerning irrigation, domestic use takes precedence over agricultural and industrial uses.

Owing to the importance of water as the basis of life, says the Qur’an, God has made its use the common right of all living beings, including humans. All are entitled to use it without monopoly, wastage or abuse. Finally, in Islamic law, culture and principles, whatever is indispensable in fulfilling the obligation of preserving life is itself obligatory. Any action that obstructs or impairs the biological and social functions of water, whether by destroying it or by polluting it, therefore leads to the impairment of life itself.

On a societal level, the central role of water has influenced Islamic literature, art and architecture. This is evident in everything from the extravagant use of fountains and water in typical Islamic architecture and buildings –such as the Alhambra24 in Granada, Spain– to the strict water management in oases which has inspired the world at large by its efficiency and sustainability.

Oases are characteristic of the southern Mediterranean, and they constitute a highly-developed example of the meaning of the wise use of water. They are effectively man-made wetlands, and provide a perfect example of the way in which religious teachings influence the way humans perceive, use and manage the natural environment and its resources. In the arid lands where Islam first spread, strict water management was the only possibility for human survival, and so various techniques for this were developed. Although they are slightly different and go by different names in each country, these techniques are effectively based on the same concept. The foggara water management system in Algeria, for example, is similar to the Iranian and Omani qanat. The foggara makes it possible to maintain, and sometimes create, an oasis by digging a deep tunnel which brings water by simple gravity in the case of the foggara, from the high plateaux to the sebkha depressions, and in the case of Iran and Oman by collecting what little rainfall is available at the foot of a steep mountain range (Abbatouv et al., 2002). Traditionally three to five kilometres in length but sometimes even longer, these tunnels helped the inhabitants irrigate their land. Qanats similarly tap into subterranean water through a series of vertical shafts connected by sloping tunnels (Bouguerra, 2006). By making use of gravity, the qanat and foggara systems al-

24 Alhambra is an ‘archetype’ of Islamic architecture in the sense that it reflects the spatial and spiritual principles of one of the most advanced period in Islam.
low water to be transported over long distances without significant losses to evaporation or seepage. The simplicity yet ingenuity of these water collection and distribution systems has been inspirational, and they are still considered the most sustainable systems of managing scarce water in desert environments.

Fig. 5.21 Agriculture of subsistence in the Oasis of Aghled, Touat, Algeria.

The Islamic perception of the environment and natural resources

All religions have their own particular way of viewing the environment and the role that humankind plays as part of life on Earth. The perception of the environment and natural resources in Islam can be summarised according to its four main principles. Some of these principles do not solely address environmental matters, but rather describe a broader perception of the Earth and the role of Man within it.

The first of these principles, that of proportion and measure, states that everything created in the environment was created in specific quantities and with distinct features that play a specific role towards the common good, creating a suitable environment for human beings and other creatures (Yunus, 2003). This belief that all created beings are performing their assigned role to benefit each other finds echoes in the concepts of interdependence found in modern ecology. This principle is well illustrated in the following Hadith (a narration of the prophet Muhammad’s words) reported by Bayhaqi: ‘Created beings are the dependents of God, and the creature dearest unto God is the one who serves only by working for the common good of all’. Hence, Muslims believe that God has not created anything in this universe in vain or without wisdom, value and purpose. Everything in the universe evolves within a balanced and intricate life cycle designed by the Divine Creator.
The second principle which assists us in better understanding environmental protection in Islam is the specific place of Man in the universe. As in Christianity and Judaism, so in Islam, too, humankind has the first right to the resources that God has provided for his creation. At the same time, he is also a part of the universe, and all elements of it together form an integrated whole, a cosmic symbiosis called *Taqa'il*. In Islam specifically, the relationship between Man and the universe is defined as a relationship of meditation, consideration and contemplation of the universe and what it contains. It is a relationship of sustainable utilization, development and employment for Man’s benefit and for the fulfilment of his interests; it is also a relationship of care and nurture, for Man’s good works are not limited to benefiting the human species, but extend to benefiting all created beings (`There is a reward in doing good to every living thing’25).

This special position of humans over other beings is closely linked to the idea of moderation, a very central idea in the teaching of Islam which leads to the next principle, that of Man’s stewardship role on the Earth. Human beings have been granted stewardship of the Earth (*Khila‘ah*) by God. In addition to being part of the universe and of the Earth, Man is mandated to implement God’s instructions. He is considered a manager of the Earth and not a proprietor; a beneficiary and not

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25 Prophet Muhammad.
a disposer. Man has been granted the right to manage the Earth in accordance with the purposes intended by its Creator; he is to utilise it for his own benefit and the benefit of other created beings and for the fulfilment of his interests and of theirs. He is thus entrusted with its maintenance and care, and must use it as a trustee within the limits dictated by this trust. Khalid (1996) states that although ‘we (humans) are equal partners with everything else in the natural world, we have added responsibilities. We are decidedly not its lords and masters, but its friends and guardians’. These added responsibilities are accompanied by specific injunctions against upsetting the natural order through pollution and other degrading activities.

The final principle relates to the views of Islam on development and conservation. This sees the utilisation of natural resources as the right and privilege of all people and all species, and hence humankind should take every precaution to ensure the interests and rights of all others, since they are all equal partners on Earth. As the Prophet says, ‘A Muslim who plants a tree or sows a field, from which man, birds and animals can eat, is committing an act of charity’. The use is not restricted to one generation above all other generations. It is rather a joint resource in which each generation makes the best use of nature according to its needs, without disrupting or adversely affecting the interests of future generations. The right to harness and utilise natural resources necessarily involves an obligation on Man’s part to conserve them both in quality and in quantity. It follows, then, that Man has neither the right to cause the degradation of the environment nor the right to exploit and use natural resources unwisely. The attitude of Islam to the environment is firmly based on the prohibition of abuse and on a balanced use of natural resources.

The Islamic principles outlined above which help us understand this religion’s perception of the environment and of the use of natural resources, are closely linked to the Shari’a, and to particular tools and institutions created in order to manage the common welfare. The ultimate objective of Islamic law concerning environmental protection, and a feature particular to Islam, is the ‘universal common good of all created beings’ in the present and in the future. In order to achieve this objective, no species or generation may be excluded from the administration and planning process. The responsibility for conserving nature falls on the conscience, capacity for action and influence of the individual. The individual is, however, reminded of the following religious obligations: no wastage or over-consumption, no illegal or unjustified obstruction of natural water flow or destruction of any component of natural resources, and no damage to, abuse or distortion of the natural environment.

**Islamic resource management systems**

In the Islamic tradition, governing authorities and decision-makers are responsible for securing the common welfare of society as a whole and for protecting it from harm, a mandate which includes the protection and conservation of the environment and natural resources. At a practical level, the manifestation of Islamic
law and principles is found in resource management systems such as the *Hima*, the *Haram* and the *Waqt*. A *Hima*, meaning ‘protected place’, is an area set aside for the conservation of fields, forests, wetlands and wildlife with specific regulations concerning grazing, tree-cutting and water use. A *Haram*, meaning an inviolable zone, defines a protected area where resource use is strictly controlled usually around towns and villages. A *Haram* is used to protect water catchments and rivers, and introduces a concept of the ‘carrying capacity’ of an area to support a certain level of human activities. The *Hima* is closely related to the specific natural characteristics of a particular area and can take many forms through regulations on grazing, the protection of specific trees like juniper or its designation for specific villages. A *Waqt*, meaning charitable gifts and loans, takes the form of funds or a land trust dedicated in perpetuity to charitable purposes such as agriculture and grazing research, or the protection of wildlife habitats and public waters.

These systems of managing natural resources that stem directly from Islamic law were implemented successfully for centuries, though they have been widely neglected in the last fifty years. It is interesting to note that recent attempts to revive the *Hima* in Lebanon have seen successful, and that it has been used in several sites in place of more international concepts of ‘Natural Reserves’ and ‘Protected Areas’. Since a *Hima* is based on the cultural heritage of the inhabitants, it is more easily understood and more likely to be respected.

**Links between Islamic teachings and wetland management**

The perspectives, principles and laws of Islam relate very well to the concepts of modern ecology and, more specifically, to the wise use of natural resources. The Ramsar Convention on Wetlands requires its Contracting Party governments to promote the wise use of wetlands, a concept which implies that wetland conser-
vation need not exclude the human element, but rather allow human use to be a positive factor in the sustainable management of wetlands. The application of the concept is crucial to ensuring that wetlands can continue to deliver their vital role in supporting the maintenance of biological diversity and human well-being.

Furthermore, the Ramsar Convention and the Mediterranean Wetlands Initiative value wetlands not only in terms of their role in conserving biological diversity, their hydrological significance and other physical functions, but also in terms of their cultural significance. Religion is part of people’s cultural heritage, and wetlands obviously feature strongly in this heritage in the southern Mediterranean in the ways described in this paper. Moral conviction and ethical consciousness can motivate people to go beyond objectives driven by short-term profit, and can lead them to make personal sacrifices for the common good. Hence, resource management systems that take into account the local religious context are likely to be more efficient than ‘imported’ ones.

![Fig. 5.24 Ksar of Tinekram, Gourara, Algeria.](image)

At the same time, wetland users in Islamic countries are likely to be predisposed to accept and respect water and wetland conservation systems based on Islamic teachings, as discussed above. In order to achieve these links between religious conviction and the management of natural resources, it is vital to promote the preservation of spiritual traditions related to wetlands, and to promote the protection of wetlands through culture and spirituality. The opportunity to do so is often feasible in the southern Mediterranean, because wetlands have associations with saints and rich religious traditions behind them. For example, in Tunisia two wetland sites have such associations: Bahiret El Bibane and Ghar El Melh. In the former, which is situated close to the border with Libya, it is said that the saint Sidi Al Chaouch came from Morocco on his way to Mecca for the holy pilgrimage of El Hadj. In this region of the Sahara, where travel was both difficult and dangerous, he found secret paths to the shortest routes to Libya among the changing marshes of El Bibane. According to local history, he settled on the main
islet of the lagoon, helping travellers to cross the marshes. Ghar El Melh, situated in northern Tunisia, is closely associated with the saint Sidi Ali El Mekki, who is said to have dedicated his life to contemplation in a place that overlooks the entire wetland. To this day, an important religious practice for local inhabitants is visiting their spiritual leader, Sidi Ali El Mekki—the **Marabout**.

These local legends and customs which are so closely linked to the area’s natural resources can be positively exploited to promote awareness and a sense of responsibility in local inhabitants, who are often religious individuals. This kind of heritage can also be used to promote the wetland in an ecological and cultural tourism context which can not only generate income for the locals, but also make the conservation of the natural environment ever more relevant.

*Fig. 5.25* Scene from a village in Tamentit Oasis, Adrar, Algeria.
Conclusions

In conclusion, Islamic tradition takes a specific view of Man and his role in environmental protection. Wise use is important for his benefit, but also for the benefit of all living things for whose protection he is also responsible. This makes the conservation of natural resources –including wetlands– a moral and ethical obligation. Appealing to the religious convictions of a population and emphasising the historical and religious significance of certain wetlands will certainly reinforce a feeling of connection to the natural environment of those wetlands and a sense of personal responsibility towards them. Ideally, it will also foster a respect for the deep connection between humankind and the environment.

References


Hamed, Safei el-Deen (1993), Seeing the environment through Islamic eyes: Application of Shariah to natural resources planning and management, Journal of Agricultural and Environmental Ethics, 6 (2), 145-64.

Khalid, F. (1996), Guardians of the Natural Order, Our Planet 8 (2), 8-12.


The Hima: an ancient conservation system from the Arabian Peninsula for the future

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Abstract

Hima is a traditional approach for the conservation of natural resources that has been prevalent in the Arabian Peninsula for more than 1500 years. It started with the tribes who depend on scarce natural resources for their livelihood in harsh environments. This community-based conservation approach evolved in tandem with Islam, which added to it the important values of equity, distribution of benefits, common goods and participatory decisions. Over the last 60 years, the Hima community-based approach to conservation has declined and been replaced by the centralised governmental management of natural resources. The Society for the Protection of Nature in Lebanon (SPNL) is currently leading the revival of the Hima approach for the conservation of Important Bird Areas (IBAs) in collaboration with elected local authorities. The SPNL is also helping to merge the values of the traditional Hima approach with the current scientific conservation tools for site identification, stakeholder analysis and social assessments. The revival of the Hima approach might offer opportunities for sustainable development, since it tackles conservation and poverty alleviation issues simultaneously.

Keywords: Hima, tradition, conservation, community based, natural resources, management system, Islam

The Arabian Peninsula has known some form of nature conservation since antiquity. It appears that the ancient Egyptians had a grasp of their environment and its needs some 5000 years ago. The Roman emperor Hadrian issued a decree protecting parts of the cedar forests of Lebanon as early as the first century AD.

There is, especially in the states of the Arabian Peninsula and certain other Arab and Islamic countries, an ancient system of community-based protected areas known as the Hima. The Hima is a type of management system in which local stakeholders control the use of a community’s common property in order to conserve water and vegetation in harsh environments. In existence for over 1500 years, the Hima is possibly the oldest known organised form of conservation in the world.
When studying the ecology of the Arabian Peninsula, one must bear in mind that this is one of the world’s most arid regions. Nevertheless, its ecosystems have been exploited continuously for millennia. As a result, for much of its history, life in this part of the world has essentially been a daily struggle for survival by harnessing limited resources. The Hima, essentially an area set aside for conservation, has played a vital role in this struggle by preserving such essential resources as forests and grazing lands.

In the past, there were thousands of Himas, especially on lands owned by village communities of the Hijaz and Asir highlands in Saudi Arabia. There, Hima areas ranged in size from a few hectares to several thousand, and their use was regulated by complex, largely unwritten rules. Their management was to a large extent adapted to the particular circumstances of each Hima, and each Hima had its own set of regulations. Nowadays, only a few working Himas survive in the Arabian Peninsula (in Saudi Arabia and Oman), mainly as a result of rural depopulation and settlement, changes in rangeland use, and the centralisation of protected area management since the 1960s.

In this part of the world (i.e. the Arabian Peninsula), nature conservation does not always take the same form as it does in the West. That is, not all protected areas are created by parliamentary statute, with some being protected by custom or unwritten convention. While the status of these areas may be fully binding in the countries where they exist, it is not always recognised by international conservation authorities whose approach is essentially general and often pays little heed to local specificities. An IUCN list of protected areas states that the area of the Arabian Peninsula set aside for conservation is equivalent to some 48 million hectares or about 3.6% of the region’s total area, and that while some countries have no area set aside for conservation, some have more than 10% of their territory set aside. Also, in several of these countries security zones have been created along international frontiers that are de facto protected areas, in that human access is restricted (IUCN, ProtectedAreas of the World, vol.2, Nov. 1991).

![Fig. 5.26 Hashani River and cultivated private lands, south-eastern border of Hima Ebel Elsaqi, southern Lebanon.](image)
Islam and the Hima approach

Islamic law (Shari’ah) recognises the importance of conservation. The prophet Mohammed stressed this when he told the parable of the ship, comparing the earth to Noah’s Ark, saying that one must gratify one’s needs while bearing in mind the balance of nature and the common good (Llewellyn, 2003).

Islam’s five religious pillars, namely As-Shahada26, Prayer, Fasting, Pilgrimage and Almsgiving, constitute the practical tenets of the faith. On a theological level, there are a number of other tenets and beliefs, which, important though they are, are overlooked—in favour of the practical five tenets—by people with a superficial grasp of the faith. The theological tenets are Tawhid, or faith in the Unity of God and of his creation (God being the undisputed supreme being); Taqva, the attitude of reverence, care and carefulness (that is, each person, whether man, woman, or child, and each organism, no matter how insignificant it might look, is created for a purpose, and therefore none must be wantonly treated, and no life must be taken except for reasons of subsistence or survival); Rahma and Ilhsan, compassion and beneficial works; and most relevant in this case, Khilafah, or stewardship (Llewellyn, 2003). The Qur’an states that God has made human beings ‘stewards’ or Khulafaa of the world as a test of merit, and wasteful use of resources is strictly prohibited. Islamic law also makes provision for the safeguarding of ecosystems and the incorporation of the Hima and Harim systems into legal systems for protecting pasture, range-lands, areas around wells, water resources, fauna and flora (Joma, 1991).

One provision of Islamic law is the Waqf, an endowment for charitable purposes dedicated in perpetuity to the cause of God. A Waqf is a piece of inalienable public property that serves the common good. Waqf have been used to create mosques, schools, hospitals, and other public works since time immemorial, yet very few have been set aside for conservation purposes (Llewellyn, 2003). If exploited, the conservation potential of the Waqf is vast. References to conservation in Islamic law include the two sacred sanctuaries of Mecca and Medina, which must not be disturbed under any circumstances (Llewellyn, 2003); Harim zones, which are basically the green belts and easements of any community which are not available for development by individuals (Llewellyn, 2003); and the category which is the focus of this paper, the Hima, which refers to any area of wild nature which is public property and is protected by the community (Llewellyn, 2003).

The history of the term Hima goes back to the Jahiliyyah, or ‘Time of Ignorance’, which refers to the era before Islam. In those days, tribal chiefs would mark certain zones as their own private territory and forbid the common people from using them. The Hima was thus considered an instrument of oppression. The Prophet banned the institution of Hima for private use and declared that a Hima must be only set up to serve the common good. He set up, among others, a Hima surrounding the Medina.

26 The declaration of belief in the oneness of Allah.
sanctuary, banning hunting within a radius of four miles and the destruction of vegetation within a radius of twelve. Until the 1960s, there were thousands of Himas in Saudi Arabia, which were managed locally and with the consensus of the local populace. The Hima was in many cases a clan enterprise, and often therefore a source of conflict. The authorities have tended to view the Hima as an institution of clan society and have consequently withheld their support from it (Llewellyn, 2003).

**Types of Hima**

In general, there were five main types of Hima reserve:

- Areas where grazing of livestock was banned and where the cutting or collection of grass was strictly regulated;
- Areas where grazing was restricted to certain seasons and to certain domestic animals;
- Beekeeping reserves where grazing was restricted during pollination, and where cattle grazing was permitted for only part of the year;
- Woodlands where the cutting of trees was forbidden;
- Reserves set aside for the welfare of a village, town or tribe (see also Haram). A Hima reserved for a village was known as a *Kasd*; those belonging to the tribes were known as *Diras*.

Another classification of Himas was as follows:

- Section Hima: most Himas were used and controlled by several (up to 10) small villages (approximately 50 households each) of the same tribal section;
- Village Hima: use and control was the sole prerogative of a single village;
- Individual Hima: some areas were reserved by individuals as private pastures (these were usually much smaller than section or village Himas).

More recently (Eighmy and Ghanem, 1982), this latter typology has been expanded to include certain details such as the restriction of access to the Hima by certain sections of the tribe and the species of livestock allowed to graze there.

Lately, the presence of an ibex reserve operated by the Balawi tribe in Western Saudi Arabia has been reported which apparently dates back to the late eighteenth century. Himas are generally open rather than enclosed areas, as opposed to *Hujrahs*, or private Himas, which are fenced off. In the past, Islamic law required trespassers to pay a fine in the form of certain articles of their personal property. Violation of tribal laws can be reported by any member of the tribe as long as he is a credible witness, and traditional tribal customs regulate the punishment of any violation. A more contemporary source, Eighmy and Ghanem (1982) suggest that a typical punishment is to slaughter one or more of the trespassing sheep or goats. It is assumed that this relates to the study area they covered, since tribal norms can differ between northern and central areas of the Arabian Peninsula. They also
noticed that more recent punishments (by the 1980s) tended to be less severe, involving the national urban system of police, religious judges, fines and warnings, but repeated offences may lead to imprisonment (Llewellyn, 2003). This can be attributed to a reduction in tribal power and a decline in the rural agricultural communities of the Hijaz Mountains as a result of the rapid social and economic changes the country has experienced since the 1960s.

The Hima in Saudi Arabia

One of the most comprehensive Hima systems in Saudi Arabia existed in the Hijaz region in the west of the Kingdom. This, like all Himas, had its own unique formula for conservation—a blend of traditional agricultural methods, environmental conditions and social factors to sustain natural resources. The key factors were draft animals used in farming, and the seasonal drought. Many Himas were reserved in order to maintain a steady supply of fodder for these animals, in addition to being a strategic reserve in times of drought. The collapse of traditional farming methods all but sounded the death knell for the Hima system27. The rapid change in the agricultural community and the introduction of modern machinery over the last thirty years has led to a decline in the demand for oxen and donkeys in the area. Consequently, many Himas were abandoned and regulations were relaxed, which allowed shepherds to utilise the rich and diverse vegetation in the protected zones. The power of tribes and communities diminished at the same time, although some villages and tribes in Al-Hijaz maintained their Himas as part of their tribal identity and heritage.

Tribal and village reserves may differ according to political and geographical factors in different Arab countries. In northern parts of the Arabian Peninsula, where emphasis was placed upon seasonal grazing grounds and water sources, the commonly used name is Derah. In the more village-based communities of the central region of Najd, reserves (Hotat) are associated with village agriculture and used mainly for camels and farm animals. Grainger and Llewellyn (1994) describe similar systems in North Africa, where they are known as Ghidal or Zenakah. They also exist in Islamic parts of sub-Saharan regions, including Nigeria and Bornu, where they are called Mahram. Al-Gilani (1998) suggested that the Hijaz region maintained the most comprehensive reserve system in Saudi Arabia, mainly along the mountain chain. The widely used name there is Hima. It should be noted that, although most Himas can be found in mountainous regions, several exist in the Tehamah plain, too.

A study of the Himas of the Baha region of Saudi Arabia is under preparation at the time of writing (late 2010) by Hala Kilani28. This will utilise previous studies to meas-

27 In the 1960s, there were still around 3000 Himas in Saudi Arabia. The neglect and collapse of the Hima system has occurred over the last thirty to forty years.

28 Al-hima: A way of Being. Traditional nature conservation practised by tribal groups in the Arab and Islamic worlds for over 1400 years (Saudi Arabia), Ph.D. thesis, University College London, UK.
ure the degree of deterioration in the system and the factors that had led to it. A more detailed investigation of several selected Himas will cover environmental, social and economic factors, especially the tribal and social structure, land ownership conflicts, environmental factors and modern agricultural methods that have impacted on the Hima system. The importance of such research lies in documenting indigenous knowledge about traditional Himas before it is lost. Diagnosing influential factors will help in assessing the system and drawing up management plans for reviving it as a potent tool in resource management and nationwide sustainable development.

Compared with open rangeland, the Hima system has been markedly successful in combating erosion and other ecological effects of overgrazing. Attempts to revive certain elements of the system are now underway in Saudi Arabia, mainly as part of the management programme for the country’s growing number of protected areas. The use of these areas has changed over the years, partly because the mechanisation of agriculture has reduced the need for pasture for draft animals. Nevertheless, some sites are still considered important as sources of fodder. Some Himas are also used for the production of luxury honey, whereas others produce timber, both of which are important in the local economy. Besides their obvious utility in the conservation of biodiversity, they have and will continue to have an important role as seed sources, which could be very important in efforts to rehabilitate the degraded rangelands of Saudi Arabia. Islamic law, rooted in the Qur’an and the teachings of the Prophet Mohammed, recognises the importance of conservation and lays down an elaborate system by which humans can make use of ecosystems while preserving natural resources. Historians have demonstrated time and again that failure to conserve natural resources can lead to war and the collapse of states and empires. The government of Saudi Arabia, as well as those of other Arab states, recognises the importance of the sustainable use of natural resources. Unfortunately, much of the published information on Himas pertains only to Saudi Arabia and neighbouring countries where, though it exists in the legal systems of most Muslim countries, the institution is most developed. There are countless references to the institution of Hima in the recorded documents of Muslim lands from Turkey to West Africa.

Despite the intense pace at which development in Saudi Arabia has proceeded since the early 1970s, the necessity of maintaining the country’s fragile ecological balance has not been neglected. In 1986, the government of the Kingdom established the National Commission for Wildlife Conservation and Development (NCWCD), one of whose main tasks it is to develop and maintain an organised system of protected areas throughout the country. While this started by building on the traditional system of Hima, it has developed to include sites selected for conservation on the basis of more modern criteria. The conservation efforts of the NCWCD are directed towards sustainable utilisation. Unfortunately, however, the current low density of wildlife populations means that the use of resources must be restricted. At present, 57 terrestrial sites have already been designated for protection while
some 47 marine and coastal areas have been identified as potential protected areas (the first of which was the island of Umm al Qamari in 1977). In order to make an appraisal of sites suitable for designation, two main considerations must be kept in mind: the ‘natural values’ which determine whether an area is fit for conservation, and the ‘practical considerations’ which determine whether this is feasible and, if it is, the degree of urgency for action. The Saudi Arabian approach for designating protected areas is pragmatic and flexible rather than doctrinaire. As a result, there has been a marked recovery in terrestrial wildlife numbers since the late 1980s.

The Hima in the Gulf States and Yemen

There were a number of conservation approaches in different parts of the Arab World that were more or less equivalent to the Hima. Yemen, for example, boasts a conservation system known as the Mahjur system, which had its beginnings in pre-Islamic times. Mahjur areas were set up during the rule of the Imam, and although they technically no longer exist (having been abolished with the demise of the ancient Yemeni regime), they are still acknowledged and relevant practices are still followed by some tribes and clans in areas where government influence is weak. There are four main types of Mahjur areas, namely:

– temporary Mahjur areas (during part of the year only);
– permanent Mahjur areas (all year round);
– village Mahjur areas;
– rangeland Mahjur areas (divided among tribes in an intricate manner).

There are also fields known as the Mahasjir fields in Yemen, Maghreb and Algeria, which are croplands on which crop residues are left for grazing after harvesting.

The name for tribal and village reserves may differ from one country to another in the Arab region. In Oman, there was a home-grown version of the Hima known as the Hawtah, which was also its usual name in Najd. Rangeland reserves in Syria were known as Mahmia or Mar’aa, whereas those of Turkish and Iraqi Kurdistan were known as Koze (Draz, 1978); in the northern parts of the Arabian Peninsula, where the emphasis was on seasonal grazing lands and water sources, the commonly used name was Derah. Grainger and Llewellyn (1994) describe similar systems in North Africa, where they were called Ghidal or Zenakah. Others exist in Muslim areas of sub-Saharan Africa, including Nigeria and Bornu, where they were known as Mahrams.

The Hima in Lebanon

Lebanon, in particular, has witnessed a revival of this ancient system, with the creation of Himas in such locations as Ebel es-Saqi (the last Lebanese stopover for migrating birds before Hula in Israel), and the Kafar Zabad wetlands in the
Bekaa valley. These two particular Himas are Important Bird Areas (IBAs) identified by the Society for the Protection of Nature in Lebanon (SPNL) and designated by BirdLife International. These areas have been declared Himas by decision of the municipal authorities in collaboration with the Society for the Protection of Nature in Lebanon (SPNL). In addition, there are other areas which, though long since designated as Himas, do not yet function as such – e.g. the area of Jabal al-Rihan. Many of these areas are under active consideration by SPNL to be revived as Himas after scientific assessments and declaration as IBAs.

Fig. 5.27 Data collection from ringed birds.

In the past, the Lebanese Ministry of Agriculture was the main agency responsible for marine and terrestrial wildlife, including the management of forests and other protected areas. The Bentael National Park was established in 1979 by a presidential decree based upon the request of a group of conservationists, and the management was delegated to a local committee (the Bentael National Park Committee). It was later followed by the creation of the country’s first two statutory nature reserves (Ehden and Palm Islands) under Law 121, which was passed by the Chamber of Deputies in 1992.

The above three sites are now recognised by SPNL and BirdLife International as IBAs, along with 12 other sites in Lebanon (as of 2009). This outcome has been supported by a three-year research project conducted by SPNL and A Rocha Lebanon, funded by the MAVA Foundation (2005-2009).

In 1993, when the law for the establishment of the Ministry of the Environment (MoE) was passed, the governance of Nature Reserves became the responsibility
of the newly-created Ministry, although protected forests were governed by a law relating to the Ministry of Agriculture.

In collaboration with the Lebanese MoE, as well as the IUCN and the UN Development Programme, the SPNL has designed the first protected areas project in which local NGOs managed three protected areas on government and municipal lands under the nature reserve legislation for a period of six years. At the end of the project, the MoE transferred the management of nature reserves from the local NGOs to Government Appointed Committees (GACs).

The Government Appointed Committees became the sole institutions responsible for managing all nature reserves, with the exception of the Shouf Cedar Nature Reserve, where the GAC sub-leased the management of the reserve to the Al Shouf Cedar Society for a period of three years. These GACs consisted of representatives from relevant ministries and local NGOs, as well as national conservation experts.

At the local level, municipalities were still managing their municipal lands as Himas and hired a ranger (called Nator) from the local community to protect the areas’ resources. In this manner, the Himas were preserved until the beginning of the Lebanese Civil War in 1975.

The SPNL and the Hima

Ever since its establishment in 1986, the SPNL has advocated the establishment of protected areas and has initiated projects in collaboration with the Lebanese Ministry of Environment, the UNDP, the IUCN and the ‘MedWetCoast’ programme of MedWet, as well as helping with the management of the Al Shouf Cedar Reserve. After twenty years of experience working with nature reserves through government agencies, and with increasing challenges at the local, national and international levels in relation to the need to involve local communities in the management of natural resources along with continuing challenges facing the protection of private lands, the SPNL is now supporting and advocating the revival of the Hima system.

Since 2004, the SPNL has helped to establish six Himas in four Key Biodiversity Areas (KBAs) – namely Ebel es-Saqi Forest, the Kfar Zabad and Anjar wetlands, the Qoleili and Mansoury coastal areas and, more recently, the Upper Akkar/Her-

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29 Nature Reserve is the first category in the IUCN categorisation of protected areas. It calls for complete conservation to protect biodiversity and prevents any human activities within the site. The government can only declare nature reserves on public land.

30 The Key Biodiversity Areas (KBAs) approach is a consistent methodology for identifying and mapping important natural habitat. These sites are identified at a national level by local stakeholders using a set of transparent and globally standardized criteria. To meet the KBA criteria, a site must contain:
- One or more globally threatened species;
- One or more endemic species which are globally restricted to the site or surrounding region;
- Significant concentrations of a species (e.g. important migratory stops, nesting sites, nurseries or breeding areas); and/or
- Globally significant examples of unique habitat types and species assemblages.
mel forest region. Although driven by conservation priorities set by SPNL, responsibility for the management of these six Himas has mostly been devolved to local community groups. This has been achieved through participatory planning, capacity-building and awareness-raising at the local level. The centralised system of governance of statutory protected areas results in uneven benefits to local communities. The SPNL is therefore hoping to gain greater support for the Hima approach as a viable complementary approach to nationally designated protected areas. The involvement of local communities and the direct benefit they gain from the protection of the areas will ultimately improve the status of the natural resources themselves.

For this purpose, SPNL, BirdLife International, the IUCN, the American University of Beirut (AUB) and others have sought to fuse their capacities and pool their expertise so as to develop the potential of the Hima system to contribute to the protection of natural resources. During the IUCN World Parks Congress in Durban, South Africa, in 2003, IUCN members from West and Central Asia and from North Africa committed to look more deeply into traditional approaches that have a proven historic record in achieving conservation through livelihood security, equity and increased local community participation.

During the 2006 Birdlife International meeting in Yemen, regional members from the Middle East adopted the Hima approach as a means for conserving IBAs; the proposed Middle East strategy was approved by a Birdlife Global Council meeting in Qatar in 2008. During this global meeting in Qatar, the Hima Fund was established with a generous contribution of $1 000 000 (USD) from Shiekha Jawaher for seed money.

A workshop held in post-conflict Lebanon in March 2007 was considered an important step towards honouring the commitments made in Durban. More than 50 conservation professionals representing different institutions in Saudi Arabia,
Qatar, Egypt, Oman, Yemen, Jordan, Bahrain, Syria and Lebanon as well as experts from Europe came to Lebanon to discuss conservation for poverty reduction and traditional approaches for achieving this goal, mainly through the revival of the Hima approach.

The three-day meeting, which identified major gaps in our knowledge of the Hima and other traditional conservation systems, resulted in a road-map towards more equitable conservation actions and poverty reduction in the Arabian Peninsula using traditional approaches. Participants agreed to use, promote and support this ‘road-map’ as an enabling framework for creating synergies and complementarities to advance traditional approaches to conservation, such as the Hima approach, in the region. The road map covers the following steps:

i. Working towards a vision for the Hima.

ii. Improving understanding of Hima and other approaches discussed in the workshop, such as Aflaj and other water management systems, agricultural terraces, Awqaf, Harim zones of water bodies, Hujrah systems in Yemen, village tenure systems, grazing systems of mobile pastoralists, etc.

iii. Strengthening the legal and policy framework.

iv. Improving the implementation of Hima revival projects.

v. Promoting the Hima concept in national, regional and global conservation policy.

vi. Linking and creating networks between Hima initiatives worldwide.

vii. Awareness-raising, education and communication.

viii. Raising resources to work on advancing the Hima concept.

ix. Identifying next steps and allocating roles and responsibilities.

One of the main results of the 2007 workshop was the production of an important publication *Hima; A Way of Life* that compiled the available information on Hima history, governance and other related issues.

The road map and the Hima vision were presented at another IUCN meeting, the Regional Conservation Forum (RCF) held in Iran in May 2007. This meeting gathered all the IUCN members from the West & Central Asia and North Africa region31. The North African members participated actively in the special Hima session organised at the RCF. They said that the Hima and/or equivalent approaches exist in North Africa, too, especially in Egypt, and that it would be worth exploring their development as a potential solution to some of the problems faced by central government in managing protected areas. The North African members said that the Hima is closely knit into their culture, identity, and history.

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31 The regional IUCN office in Amman served West and Central Asia in addition to North African nations at that time.
The SPNL has successfully revived the Hima approach in six KBAs in Lebanon, and will undertake site-based activities and monitoring to assess the effectiveness of the Hima approach in responding both to the needs of nature conservation and of local livelihoods.

Aware of the obligations applying under the different international agreements ratified by Lebanon (e.g. the Convention on Biological Diversity, the Ramsar Convention, the Addis Ababa principles on sustainable use\(^{32}\) and the Millennium Development Goals), a parallel policy analysis of the Hima system will be undertaken to evaluate the extent to which it offers opportunities for achieving the objectives of these different agreements.

As mentioned earlier, the Hima is a traditional practice which extends from North Africa to Central Asia. Bearing in mind this tremendous cultural heritage and the indigenous knowledge associated with it, the SPNL aims to harness expertise and experience relating to this practice from across the region. Ultimately, the Hima approach will be recommended at the international level as a viable way of achieving sustainable development in the region.

The overall goal of this revival is to fuse traditional values in the Hima approach with recent developments in conservation science (site identification, stakeholder analysis, linkage between livelihood and natural resources) as a way of achieving sustainable development. This is the ‘hybrid’ Hima that the SPNL is currently promoting in collaboration with municipalities and local elected authorities for the conservation of IBAs and KBAs.

**Future of the Hima**

What does the future hold for the Hima approach? A number of researchers have observed that this ancient community-based conservation approach has immense potential if properly developed. Thus, grazing lands might be rehabilitated, while many areas that support rich biodiversity are already conserved as Hima and could be valuable as research areas for scientists and for the protection of endangered species. Perhaps the most important aspect of the Hima approach is its scope for integrating benefits to wildlife with the many ways in which it can also be of benefit to people.

In order to fully revitalise the Hima, full legal frameworks in each country should be drawn up.

One question that has legitimately been raised is whether the preservation of the Himas is actually viable. It has become clear that while many can be revived, it is not always feasible to do so. The revival is therefore likely to be selective rather than a wholesale enterprise. What is clear, however, is that this ancient tradition, if lost, would take with it a trove of indigenous knowledge and benefit.

The Hima system, if revived, would enjoy three vital advantages: ecological sustainability, economic viability and acceptability by local people, not least because it involves the reviving of an ancient tradition that is enshrined in the laws of Islam, the Arabian Peninsula’s main faith. It would be a tremendous step towards conservation in this region, and a unique synthesis of tradition and modernity. This is what the SPNL is trying to achieve.

Fig. 5.29 Training in birdwatching techniques.

References


5.4 Aesthetics and artistic expression

Wetlands and water have provided inspiration for various art forms, from landscape painting to the cinema, from songs to dance, from literature to architecture. This inspiration is perhaps rooted in expressions of deep respect for wetlands by the ancient peoples who lived in close association with them.

Some characteristic examples include:

- In Egypt, most of the well-known ancient art in architecture and painting has been inspired by flora and fauna species of the River Nile (see also box in p. 388).
- The poets who gave artistic written form to the symbols and stories of Greek mythology, from Homer to Ovid in Augustinian Rome, drew upon inland wetland, river, and coastal scenes for many of their most exciting tales.
- The painter Canaletto, born Giovanni Antonio Canal in Venice (1697-1768), found some of his favourite themes in lakes, marshes and rivers.
- The painter Claude Monet (1840-1926) produced a series of paintings of aquatic plants in the pond he had built at his home in Giverny, France³³.
- Salvador Dali’s *Metamorphosis of Narcissus* (1937) and *Swans Reflecting Elephants* (1937) were also inspired by wetlands.

In Ghar el Melh, Tunisia, a photography festival is held on a yearly basis, while a similar yearly event is organised at Arles in the Camargue, France.

Other pertinent examples (from the Ramsar cultural heritage in wetlands leaflets ‘Wetlands – an inspiration in art, literature, music, and folklore’) include those described below.

Wetlands often feature as settings in English novels, such as Charles Dickens’ *Great Expectations* and Daphne Du Maurier’s *Frenchman’s Creek*. Efraín Otaño Gerardo of Cuba was inspired by the Ciénega de Zapata Ramsar Site in his homeland, and has written many poems about the wetland and its wildlife which were recently published as a book³⁴.

Water festivals feature commonly in folklore celebrations around the world, including the water festival celebrated each year by the Dai people in China, which is associated with fertility and good fortune. Crane festivals have been common in Japan for centuries, celebrating these birds’ arrival in the winter and their departure for Siberia to breed in the spring: cranes are a powerful symbol of longevity in Chinese and Japanese culture³⁵.

³⁴ Ibid.
³⁵ Ibid.
Wetlands as sources of inspiration

Artists throughout the centuries, from Turner to Monet, have been inspired and motivated by wetlands. Rivers feature prominently in the art of many religions: the Jordan serves as the scene and means of Christ’s baptism, while the River Ganges provides cleansing power for Hindus, and the flowing river is a key symbol in Taoism. Much music has also been inspired in a wetland context, from Schubert’s Trout Quintet to Ray Davies’ Waterloo Sunset and the blues, a genre that blossomed in the Mississippi Delta of the southern USA.

References

WWT (2008), *Wetland living - people, cultures and wetlands*, Wildfowl and Wetlands Trust

Ramsar Guidance

Indirectly, the exposure of wetlands and their values to broader awareness and appreciation through art has contributed to their conservation. The question is whether this contribution can be made more explicit and can be strengthened. This is a clear objective incorporated in the Ramsar Guidance (Ramsar Guidance, p. 62).

O.4.4.1 –
To work with the arts to promote wetland conservation and interpretation

The following actions may be required:

a) identify art forms and specific works that have been inspired by or based upon wetlands and water, in cooperation with artists and art-related institutions at the local and national level;

b) use and promote artistic expressions as means to advance the conservation and wise use of wetlands;

c) cultivate the interest of the art community in the full range of wetland values, and in wetland and water management issues;

d) incorporate appropriate art in visitor facilities and interpretation, and especially in eco-museums; and

e) sensitise wetland managers, and all those involved with wetlands and water, to culture and to the art forms that express it.

The Convention has followed this advice occasionally by using artistic designs in the logotypes of its Conferences of the Parties, in posters and on the covers of
publications, but not in a systematic manner. It is clear that much more focused work on art and wetlands would be beneficial, and the Mediterranean would be a good place for pioneering efforts to be made in this sphere.

The type of activity required is illustrated by an example from the United Kingdom. Building on the artistic legacy of Sir Peter Scott, the Slimbridge Wetland Centre is a focus of activities related to wildlife art. The Centre’s Cheng-Kim Loke Gallery hosted a retrospective exhibition of Scott’s work in 2000, and has since organised six exhibitions each year featuring both well-known wildlife artists and promising newcomers. This could be a good example to build on at major wetland centres in the Mediterranean.

Another interesting example is the painting competition for Albanian, Greek and Macedonian schoolchildren who live around the Prespa Lakes, held on 2 February (World Wetlands Day) in 2009. The theme was ‘Show your lake to your neighbours’ and the results were enlightening.

Fig. 5.31 People and pelicans in Prespa. Winning entry in transboundary competition from Paola Merxhani, Albania.
Nature in ancient Egyptian Art

The art of ancient Egypt reflects a strong relationship between nature and people. The natural cycle of yearly flooding of the River Nile and the regeneration of life which follows, is clearly illustrated in ancient Egyptian art, as a recognition that life is fully dependent on the river’s waters (Shaw, 2003).

Such was the esteem in which the Egyptians held the Nile’s fauna that they represented their gods as half human and half animal, demonstrating that animals were valued not just as a source of food (Strouhal, 1989), but were perceived as divine and treated with respect. The Great Sphinx and wall paintings such as the Geese of Meidum from the tomb of Prince Nefermaat are two examples in which this approach is portrayed.

In Egypt there was a prominent belief that an essence of spirituality was contained in nature and in all natural processes. Flowers and trees were a common theme in the country’s art, as symbols of resurrection and the sacred. The importance of flora can be seen in wall paintings such as the Fowling Scene from the Tomb of Amenemheb at Thebes and Ti Watching a Hippopotamus Hunt from the tomb of Ti in Saqqara. The artists gave the same attention describing in detail both the animals and the vegetation (the ever-important papyrus flowers and reeds growing in the marsh). The significance of natural elements can also be witnessed in the lotus- and papyrus-shaped capitals that top of columns in the Temple of Amen-Mut-Khonsu (Badawy, 1968).

In all its forms, ancient Egyptian art reveals the belief that nature and the continuing cycle of life is the mystical way that gods have chosen to imply their presence.

References


Case study

It has been suggested that the scale and concept of landscape is an appropriate lens through which to see successful ways of integrating the cultural values of Mediterranean wetlands with conservation issues. The landscape concept consists of various elements. Professor Peter Howard focuses on two of them in his paper: geography and the arts. He discusses the meanings which landscapes have for people, and how these can be demonstrated through various forms of art, such as literature and painting.
Wetland landscapes: perception and the arts

Peter Howard

Abstract

Landscape is proposed as the key concept to integrate not only natural heritage values with those of cultural heritage, but also to integrate public and private values of heritage. The development of the concept is outlined over time together with the shift from values based on aesthetics to those based on meanings. The discussion can then shift to an enquiry into what wetlands might mean, and to whom.

Keywords: Landscape, wetlands, Mediterranean, perception, art history, historic change

If there is to be a successful integration of the cultural values of Mediterranean wetlands with the concerns of nature conservationists, the landscape must be the platform and the concept with which this can be achieved. ‘Landscape’ is a tricky word, especially as any discussion is bound to investigate the relationship with both nature and culture, themselves words weighed down with a complex of meanings. This writer has been involved with two major elements of landscape, but we can add at least three more elements of the concept before we even consider adding further resonances from other languages.

Two perspectives: geography and the arts

To a student of geography, the concept of the ‘cultural landscape’ is firmly part of the curriculum, and this concept is largely shared by those across the disciplines of Geography, History and Archaeology. There are many roots, including Vidal de la Blache in France, Friedrich Rätzel in Germany and Carl Sauer in the USA, but they share the general idea that a landscape is a piece of territory which exhibits the impact of a culture, or indeed several cultures. There was much dispute within this broad field, most of it focusing on the degree of interdependence between culture and landscape, but all agreed that a landscape was a mappable piece of territory which was, therefore, largely viewed in plan. In the UK, one of the most popular writers in this area is the historian W.G. Hoskins, whose work not only moved the debate forward so that the landscape became a text to be deciphered in much the same way as a mediaeval manuscript, but also popularised the concept to the extent that local history groups would spend a lot of time tramping across fields trying to decode the landscape. People who have been mired in this landscape
concept are likely to think of landscape largely in plan, though retaining a domi-
nant visual element, and to see its meanings as historical. A landscape is more im-
portant if it exhibits an older history and ideally an entire palimpsest of historical
cultures, much like a geological site.

A more recent strand of this cultural landscape concept is that a landscape is less a
statement of fact that needs to be deciphered, and more a work of narrative that needs
to be deconstructed. This strand owes a great deal to the late Denis Cosgrove, one of
whose works (Cosgrove, 1993) exemplifying the technique was based on a Medi-
terranean wetland area, the terra firma of the Veneto, analysing how the entire land-
scape is designed almost as a theatrical set for the benefit of the oligarchs of Venice.
The concept of the landscape as a theatre is itself useful, although perhaps it has more
in common with an amphitheatre in which individuals and groups fight for control.

Moving into a School of Art, the author was introduced to a very different view of
landscape, and it was a view largely seen in elevation. Landscape was constructed
as a genre of art, and specifically of painting, which had reached the UK largely
from the Low Countries in the seventeenth century. It then flourished and devel-
oped to a particular high point during the early nineteenth century. However, it re-
 mains a vital element in painting and photography, where it acts as the pole of art-
istic innocence in relation to work in the cities where the artists usually earned
their living. This view owed a great deal to Clark (1949) and later to Andrews,
(1999). Both the Pastoral and the Georgic myths were closely entwined in this con-
cept of landscape, so the Mediterranean lands were invoked as exemplars of clas-
sical perfection, most notably the region of small lakes south of Rome. This con-
cept of landscape is usually seen in elevation, although the relationship between
painting and cartography ensured that this distinction was far from absolute. Land-
scape was also firmly fixed as a visual phenomenon, a fundamental element that
is proving very difficult to shift as other senses demand our attention. The land-
scape genre in artistic representation is also largely devoid of people, or dominates
them. If people become a work’s main subject, it ceases to be a landscape. Land-
scape is almost inevitably rural, so when artists depict urban panoramas, a new
term is invented: the townscape. In this tradition, despite all the obvious evidence
that the appearance of a landscape represents a battle over generations between
nations, occupations and classes, the rural landscape remains a doggedly innocent
canvas in which people can escape the vices and power-struggles of the city (Ing-
lis, 1987). Finally, it must not come as a surprise that the landscape of the still pho-
tographer and painter is also still largely without movement, depicting a moment
frozen in time (although the filmed landscape began to alter that perception).

Other views of landscape

These two great traditions of landscape—reading it as a text or viewing it as a pic-
ture— are not the whole story, as other disciplines have developed the landscape
concept in their own way. For some—notably landscape ecologists—landscape is a scale of operations which consists of many habitats, though it is worth noting that the artistic concept of landscape also has an intrinsic element of scale. Archaeologists can conceive of the landscape as the setting for the monuments they seek to conserve, and it sometimes gets confused with that useful American concept: the ‘viewshed’. In the United States, there is a particular preference for landscape as wilderness, usually visually conceived as the scenery of the West (which is fondly, if erroneously, believed to be natural, but is certainly vast in scale). Then there are the designers who conceive of landscape as an activity involved with the enhancement of places, and seek to design for the future rather than preserving the past. Here ‘to landscape’ becomes a verb which is often concerned with mitigating the brutal effects of modern urban developments.

Olwig (2002) has made a vital distinction between the concept of landscape as an aristocratic way of looking, and the German *landschaft* as a place made by people. Certainly, the definition used by the European Landscape Convention —‘a place as perceived by people’— leans very clearly towards an egalitarian concept where everyone’s perception is of significance. The idea that a landscape is a pictorial view whose quality can be judged by a set of aesthetic rules devised and implemented by experts, is largely supplanted by the idea of a landscape made by the meanings invested in it by all its users. Those meanings may indeed be aesthetic, but they may also be concerned with memory, function and ideas of ownership.

The complexities of the landscape concept are only heightened when we introduce the other languages of Europe to produce a definition suitable for a legally binding convention, but those difficulties have been overcome, or at least circumvented, and we now have a landscape concept that clearly integrates the natural and the cultural. In doing so, it differs markedly from the World Heritage Convention, which designates ‘Cultural Landscapes’ of several kinds. Within the European context—and surely this extends to the other parts of the Mediterranean littoral, too—the land has been so dominated by human action for so long that every landscape is heavily influenced by cultural activities. The Venetian Lagoon is a Mediterranean wetland that has even become symbolic of much of European culture.

The Convention also expands the concept of landscape beyond the visual, accepting that landscape qualities can be appreciated, and not only pleasurably, by the ear as well as the eye. Thus, writers may wax lyrical about the wind soughing in the trees, and composers may try to incorporate birdsong into their work. But many of the objections to new developments, especially transport infrastructure and wind-farms, are also concerned with a loss of tranquillity. Smell and touch are also integral part of our perception, with many landscape designers taking great care to include scent in their planting. The Mediterranean’s native flora is particularly renowned in this respect. While we only rarely taste landscape directly, the French concept of *terroir* also brings that sense firmly into play: you can experience Burgundy with your eyes and ears, and you can also buy it in a bottle.
Understanding significance

The new understanding of landscape made most explicit in the European Convention is particularly applicable to the problem of integrating the needs of nature and culture within wetlands, since it allows us to begin to ask rather different questions, such as ‘What do wetlands mean to people?’ The emphasis is clearly on landscape as a human right and as a human home. While great cultural artefacts such as cathedrals and castles are not to be ignored, the focus clearly moves to how people live and interact with their landscape, both now and in the past. This privileges the meanings attached to the landscape by the local people, although it does not exclude the meanings experienced by others, whether visitors, experts or simply those flying overhead.

The history of cultural heritage conservation, especially as it has evolved as a governmental activity, has been rather different, and has concentrated not on the local cultural landscape but on features of national significance. This has been called the Authorised Heritage Discourse (Smith, 2006). While the objects and places conserved vary from one country to another according to national governments’ views of significance, there is a common presumption that the sites to be conserved are those of the powerful, present and past. Cathedrals and palaces are more likely to be conserved than cottages or field boundaries. This also has the odd side-effect that the items conserved tend not to demonstrate a local, unique culture, but one common across the continent or even the world. These are precisely the places that might be put forward as World Heritage sites. The strangeness lies in so many cities having a carefully conserved ‘heritage quarter’ that ostensibly celebrates a unique local identity, but looks like every other heritage quarter (Ashworth and Howard, 1999).

The significance of these buildings and places is usually derived from a cultural historical tradition that owes a great deal to a history of art and architecture pred-
icated on talented individual artists and often on the overcoming of local natural and landscape specificities. ‘Culture’, in the sense used by anthropologists to distinguish those human activities that are not shared by animals, is an immensely wide concept, but ‘culture’ as perceived by governments has usually been narrowed down to a specific concern with the high arts. In the UK, as a not untypical example, the Department of Culture, Media and Sport clearly assumes that media and sport may relate to culture, but are not part of it. Science, which is surely the activity most indicative of our age, is excluded entirely from culture. No wonder such ministries are primarily concerned with the conservation of art and architecture that represents the highest achievements of civilisation. Conserving a twelfth-century chapel will always take precedence over conserving an unusual way of catching eels. Conserving the stonework on the façade of the cathedral takes precedence over conserving the lichens thereon. A landscape perspective will take a different view, and will assign significance particularly to those features which indicate a local landscape being modified and enhanced to support local culture, rather than being overcome by national and international pressures for conformity. There may be international exhortation to preserve local identity, but economic globalisation is usually the more powerful force.

A meanings-based landscape perspective on wetland landscapes will result in very different priorities from a perspective based on aesthetic significance. There will also be a difference between the perspectives of experts and local people. Ecologists are used to this, of course. There are many cases, such as the shores of the German part of the Waddensee, where proposals for land management on ecological principles are resisted by local people, and this is inevitably going to become worse with rising sea levels and the need for much land only recently reclaimed from the sea to be abandoned once again. Many students of rural landscape and heritage, including wetlands, are now proponents of researching ‘traditional local knowledge’ and devote considerable time to discovering the techniques that allowed many areas to be developed and managed sustainably over many generations, producing highly distinctive communities in the process. Very often, such research is backed not only by intellectual curiosity, but also by those who would wish to use this knowledge to promote a new tourism business, since rural communities are attractive to the city-dweller. However, just as the cohesion of a family depends in part on the trust between its members that a degree of discretion with regard to family matters will be observed, so it is with communities. Effective communities need their secrets, just as effective families keep theirs carefully hidden. The academic attitude, with its determination to publish, is clearly contrary to this need for secrets, even where there is no financial benefit involved. There is a danger that praising the community’s ‘traditional knowledge’ will undermine that community’s cohesion, especially when the place becomes so attractive that it becomes a magnet for those seeking a second—or even a first—home in such a community, although their income derives from elsewhere. When the heritage is shared with the world, its value to the original owners is decreased.
The other distinctive element of local people’s attitudes to landscape (Relph, 1976) is their preference for people over things. Places are important because of the events that have taken place there, and because of their connection with people. The well-travelled researcher may notice the unique quality of some artefact, but to the un-travelled local this is all he knows. The expert may praise the local dish made from local produce, but the locals might prefer a MacDonalds to prove they are part of the world. Conserving communities can so easily mean depriving them of the choices the outside world takes for granted.

These difficulties have not stopped many landscapes being designated as special, and the Ramsar Convention ensures that many wetlands are indeed so regarded. Many countries have a whole battery of different designations, and many of them overlap. In the United Kingdom the same piece of land might lie within a National Park, be owned by the National Trust, be a designated Environmentally Sensitive Area and a Ramsar site as well, perhaps, as being a Site of Special Scientific Interest and a bird reserve. The plethora of rules can baffle all but the experts. Designations also demean other landscapes, as the constant pressure for development is inevitably directed towards any piece of land that is so unfortunate as not to be designated as special, meaning the ordinary landscapes which are the working environment of ordinary people, and which carry meanings for them.

Designations are rarely changed. There may be a few cases of sites being taken off the national register of designation, but they are few indeed. Meanwhile, landscapes change not only physically but also in the minds of people. Wetlands themselves are the most obvious example of this. What was once the ‘dismal swamp’ to be drained and made productive as soon as technology allowed is now the ‘precious wetland’ to be conserved not only for its wildlife, but also for its traditional ways of life. This author can remember having his love of the Somerset Levels fenland mocked in the England of the 1960s; now they are included in a National Nature Reserve and are a designated Environmentally Sensitive Area. These changes of perception may be rapid (Howard, 1991). A detailed study of the landscapes preferred by English artists from the eighteenth century onwards reveals a major change in landscape taste approximately every forty years –that is, once every generation. While it would be dangerous to suppose that the changes exhibited by English artists could be mirrored in other countries, or by other forms of expression, or indeed by local people, there will certainly be changes, and the speed by which shifts of fashion are now broadcast through the media and adopted probably means that change is becoming even more rapid. Conservationists routinely presume that they are preserving heritage, whether tangible or intangible, landscape or building, for the benefit of future generations. Much of the evidence suggests that future generations will not be particularly grateful, for their preferences will have moved on. As landscape types or locations become fashionable, so they also become increasingly clichéd and –soon– shunned by the arbiters of taste. Artists may like to think that they leave nothing but footprints at the location, but they are the leaders of a
fashion that will soon have tour buses seeking out their favoured spots and cheap airlines seeking landing rights at the local airport (Howard, 2003).

Fig. 5.33 English wetland - a view over the Somerset Levels where King Alfred hid from the Danes, and finally emerged to defeat them and create a united England.

The evidence of English artists may at least provide some pointers as to possible changes in the significance of wetlands. Before the last quarter of the nineteenth century, wetlands were regarded as visually uninteresting, despite their suitability for romantic scenes of marginal activity, such as Dickens’ use of the Essex marshes. Lakes were effective in providing a middle-ground, enabling the painter to link foreground to background, which was a long-standing problem (Gould, 1974). There was then a major shift in perception encompassing low-lying marshland and fenland, as well as wet moors and dry heaths. Following on from French painters such as Corot and Millet, especially in the forest of Fontainebleau, these provided suitable backgrounds for the new-found interest in the dignity of rural labour. For the first time, artists began to depict the reed-beds of the fens or the barren heather moorland, usually with swirling mists and a great deal of atmospheric addition. Novelists followed a similar preference with Thomas Hardy on the Dorset heaths being perhaps the most obvious case, though Conan Doyle’s The Hound of the Baskervilles is better known. At first, the treatment of the wetland and its inhabitants was clearly deliberately uncompromising, emphasising the harshness of local lives, but slowly the pictures became more colourful and the literature more romantic. There was no longer a need for the labourer to be visible, as the hard landscape, usually in winter, made the point without his presence. A great deal of myth was attributed to marshland, and it was certainly not merely visual, for the sound of the reeds and the smell of the mud are in the descriptors, as well as the ghostly lights at night. P. H. Emerson’s early photographs of Fenland workers in East Anglia are classic examples of the genre.

These English wetlands retained a degree of interest throughout the twentieth century, especially the estuaries where boats lying on the mud became a particular landscape cliché. Towards the end of the century, a new ecological vision
arose which takes a much more direct interest in landscape as a setting for wildlife. The preferred garden becomes much less designed and trained, with a riot of colour in its place and a vast array of plants, many of them wild. The wetlands suit this wish for ‘untamed’ nature very well, although as they become protected, made tidy, and packaged for the tourist trade, their popularity with serious artists declines. The shapers of landscape taste are forever seeking the ‘unknown’ landscape, which they then proceed to publicise.

Before we leave this notion that perception is always shifting, it may be worth considering one of the obvious consequences. Not only does perception change, but that change can also be managed and directed as any advertiser or public relations specialist can testify. There can be no doubt that attitudes to wetlands have, in general, been greatly changed by the publicity attached to their wealth of wildlife and interesting communities. If landscape is ‘place as perceived by humans’, there are two methods of management, the most commonly used of which is the preservation, management or enhancement of the physical features of the landscape itself. Still, the management of its perception is probably significantly cheaper and at least as effective.

**Fig. 5.34** French wetland - an outstanding piece of landscape interpretation at the Baie de la Somme in northern France, where preserved wetland is next to a motorway service station.

**Understanding meaning**

These perceptual changes begin to lead us towards an answer to this crucial question. If landscapes are important not because of their aesthetic properties but because of their meanings, then these can be analysed culturally as well as ecologically, although the two clearly coalesce. Indeed, one of the most significant current meanings of wetland landscapes is as a wildlife refuge. Many British wetland sites are specifically protected for their abundant wildlife, and most particularly of birds, as the illustration of a coach-load of bird watchers peering at Bowl-
The former peat cuttings in central Somerset have now been replanted with reeds and are a bird reserve with a particular record in breeding bitterns, while the renowned naturalist Sir Peter Scott set up the first Wildfowl and Wetland Trust site at Slimbridge in the marshes of the Severn estuary. Of course, wetlands have connoted wildlife for many years, and the nineteenth-century interest in rural craft occupations made much of the significance of duck-shooting and eel-trapping, both now very much reduced in the UK. However, for many people, wetlands are closely associated with their chosen sport, especially hunting and fishing.

The same goes for water-sports, of course, and there will be many who cannot see a stretch of water without considering it a venue for paddling a canoe, sailing a dinghy or for water-skiing. There are even some who get close to nature by bog-snorkelling. Again this puts a very high value on such places, but obviously runs counter to many of the wildlife uses. The wetland managers’ need to have as large a supporter-base as possible requires them to allow for a great range of activities, not all of them natural allies.

These may be meanings which directly affect functionality, but a glance at the literature and arts that have emerged from wetlands suggest other ideas: most particularly, that bogs are for hiding in. Hereward the Wake, one of the English rebels against the Norman Conquest, lived in the fens of East Anglia. Rather earlier, we have the legend of King Arthur in the marshes of Somerset burning the cakes of the cottager’s wife before emerging from the marsh to raise the flag of Wessex and defeat the Viking invaders. Marsh seems to have a similar meaning as the biblical desert, meaning a place to retreat for contemplation and renewal. Indeed, the islands in the wetlands, notably Crowland or Ely and Glastonbury were sacred places of sanctuary. The impenetrability of the wetland is a recurring theme. Insiders know their way, and are a very insular breed. They were often reputed to be web-footed, and the concept of fenland people as deeply rural remains very powerful. The marsh is the ideal place to evade authority, and the description of Grimpen Mire in The Hound of the Baskervilles is perhaps the best known, although this is a wetland on top of the hills of Dartmoor and not a lowland marsh. The ponds are bottomless, of course, and there is only one path, known to very few people. In the middle is an island where something dreadful lurks.

There is a danger that landscapes will not only be considered as visual phenomena, but also as permanent, as in a picture. But landscapes are temporary and evanescent. Dawn and dusk are different, so (in temperate latitudes at least) are summer and winter, while many of the most dramatic effects depend on a particular crop at a particular time, or on a trick of the light set off by a cloud formation. Conserving cloud formations is tricky. Here, wetlands are an outstanding example. The effects are ephemeral, and so the marsh is often imagined at dawn or dusk, or at night with strange lights. Perhaps because vision is so restricted down among the reeds, sounds convey much more apprehension. This not only included
the grand effects of wind in the willows, but also the plop of a frog or a turning fish, or the boom of a bittern. Wetlands are places of mystery, and forever changing.

Clearly, this is not a carefully documented set of meanings of wetlands within British culture, and the meanings here are not necessarily those of local inhabitants, who may well have almost inverse meanings. What, for the outsider, is threatening may be a comfort for the insider. Nor can we presume that Mediterranean wetlands carry the same meanings within their cultures. There is plenty of research to be done. Once we understand the cultural meanings carried by these places, we have a good chance of ensuring that the meanings are not ignored. In following an agenda set by ecology or any other discipline, it is only too easy to ignore the meanings that cannot be seen. Tread carefully, for you tread on someone’s dreams.

The arts are a rich source of evidence for cultural meaning. Pictures are the easiest to deal with, whether they be photographs or paintings. Each picture can be regarded as a piece of data demonstrating that this landscape was of significance at a particular date, and quite possibly also with particular atmospheric conditions. The depiction may not, of course, be at all realistic. But pictures inevitably exclude the non-visual landscape, which can usually be traced in literary descriptions. However, novels and poems range over time and space in a way that makes them much less useful as a discrete, mappable piece of data. Music, however evocative, is even less amenable to direct analysis. Many places can offer a series of guidebooks over many years, together with accounts by visiting travellers. These are immensely valuable in describing which features of the landscape have attracted most attention at various times. An analysis of their content is invaluable. As always, the most difficult material to discover is the local perspective, as almost all accounts are by educated visitors (Krauss, 2003).

One extra element obvious from looking at the work by English artists is that their view of foreign places is markedly different from their view of similar landscapes at home, and probably from the view of those same foreign places by local artists. The northerner painting or simply visiting the Mediterranean is almost certainly on holiday; it is usually summertime, and the views are usually very clichéd. There are whitewashed houses and red roofs, and a glimpse of a blue sea with boats. The vegetation will be olive trees and cypresses, perhaps with a stone pine and a palm. This Mediterranean coastal view could be in any of a dozen countries. The Mediterranean is freighted with meanings deriving from the classical past and the Grand Tour, from modern obsessions with sun, sand, sea (and sex). The demand for these Mediterranean meanings is liable to prevent an appraisal of the wetlands of the region, which do not generally provide the stereotypical Mediterranean view. The recent fascination with wildlife has surfaced in important films and series emanating from the Camargue and from the Doñana, so more modern media are able to produce a new set of meanings which may indeed produce a new wave of northern visitors to the Mediterranean seeking a new experience. But wetland conservation might be better achieved without any more visitors.
References
Andrews, M. (1999), Landscape and Western Art, Oxford: OUP.

Fig. 5.35 Birdwatchers, Topsham, UK.
chapter 6

In conclusion

This book has presented a kaleidoscope of diverse perspectives on human activities and attitudes, conservation intentions and actions, cultural values and realisations. Some of these are rooted in past traditions, while others are innovative, creating new norms and perspectives for the future.

6.1 Lessons learned

The intensification since 2008 of work in the Mediterranean at the interface of culture and nature in relation to wetlands, has been a heady experience. Wetland loss and degradation may have created profound disappointment at times, but the close collaboration and companionship among partners around the Basin and, on occasion, the modest successes achieved, have often been a source of joy.

In spite of a decade of efforts at the Mediterranean and global level, the achievement of a fully integrated approach to managing the natural and cultural heritage of wetlands remains a challenge. Lessons have, however, been learned, and these will be crucial in making conservation and management efforts more effective in the future.

Arguments for an integrated approach

When, in 2002, the Ramsar Convention more explicitly promoted the incorporation of cultural aspects in wetland management, the need for an approach that appeared to add complexity was debated by many. Some wetland experts, in particular, could not see why human impacts needed to be addressed as more than threats and pressures.

Work in the Mediterranean area has demonstrated the value of an integrated approach. A principal argument is that the entire Mediterranean region has been inhabited for thousands of years, the human presence being ubiquitous and continuous, and the number of people in permanent and transient populations has risen in recent times. With very few exceptions, all Mediterranean wetlands have been affected by human actions, and these have created the cultural heritage of these places down the ages, which in turn has often determined their present status.

Fig 6.0 Hala Sultan tekke in Larnaca salt lake, Cyprus.
Research has shown that studying and trying to manage the natural aspects of wetlands in isolation from other aspects can only produce partial results, while an integrated approach allows both for better understanding of issues and for more effective management responses to those issues. In addition, taking cultural aspects into account also broadens the circle of experts who are involved, creating stronger alliances for wetland conservation, and enlarging the ranks of sensitised inhabitants and visitors, with all the benefits which that implies.

From the cultural point of view, dealing with cultural aspects together with the biodiversity aspects of wetlands allows interesting links with living heritage to be made, and allows a greater appreciation of cultural heritage in all of its spatial and temporal dimensions.

Fig. 6.1 Young volunteers restoring a wall in Butrint, Albania.

These are convincing arguments for strengthening integrated approaches to wetland management. Further work is needed, however, on implementing this approach and objectively evaluating the outcomes achieved.

Institutional weaknesses

Unfortunately, integrated efforts tend to be difficult to launch and to sustain in the long term, primarily because of institutional specificities and weaknesses in most Mediterranean countries. Traditionally, public services are split between those that deal with nature and those that are concerned with aspects of human life. It is thus typical in many countries for wetland management bodies to be involved on a daily basis with human issues and policy conflicts, but to be staffed
almost exclusively by people with a background in the natural sciences (such as biology and forestry) rather than sociologists, economists or engineers.

The artificial schism between the natural and human sciences seems to exist at all levels, and not only in public administrations. In universities, for example, few departments combine natural and anthropic sciences or conduct research into the interface between nature and culture. That said, the situation does seem to be changing, especially at the post-graduate level, where interest in integrated approaches is increasing. The same is true of non-governmental organisations, only a handful of which –for example SEHUMED in Spain, the RSCN in Jordan, the SPP and Elliniki Eteria in Greece, and Med-INA– are involved with the protection of both cultural and natural heritage.

The past weaknesses indicated on the one hand in education and research and on the other in NGO action are particularly important, as these two sectors should become the champions of integrated approaches, developing the tools required and gradually influencing government policies and practices.

Growing public support

On the positive side, it has been demonstrated that people welcome efforts to combine the appreciation of nature with the enjoyment of the cultural aspects of natural areas and wetlands in particular. This is proven by the high public participation in secular and religious events relating to wetlands, such as festivals, pilgrimages and liturgies.

There is still a lot to be done, however, to bolster and inform this positive trend. For example, very few wetland visitor centres feature information on the people that lived in the area in the past, or do more than mention contemporary human interactions with nature. In the same spirit, museums at archaeological sites rarely document the site’s evolving relationship with its natural environment. The setting up of any exhibition that truly integrates a wetland’s cultural and natural heritage would be of major benefit, and could serve as a catalyst for similar approaches elsewhere in the Mediterranean region. This could make a valuable project for a suitable organisation to undertake: the Tour du Valat biological research station, for example, could investigate these possibilities in the Camargue; and if the idea proved successful, it could applied in other priority sites such as the Gediz Delta in Turkey and Ichkeul in Tunisia.
6.2 A more integrated future: using new knowledge and international support tools

From fragmentation to integration

Culture, spirituality, interaction between humankind and the natural world, innovation, development and knowledge were at one time, for most peoples, unified inseparably in a holistic way of being. Even today, this approach is still evident in the cultures of indigenous populations; the Aboriginal peoples of Australia, for instance, perceive their world in such a way. Over history, at different times and at different rates in different parts of the world, the individual elements have become distinct domains with hotly contested boundaries between each of the ‘-isms’ and ‘-ologies’, to the point where we now diagnose sectoralism, ‘silo mentalities’ and a lack of joined-up thinking as key obstacles to achieving policy objectives.

After centuries of fragmenting our agendas and deconstructing our understanding, counter-currents of new interest are now emerging in the form of more multisectoral approaches, integrated systems, synergies between institutions and holistic thinking.

This book has shone a modest spotlight on various stages in this historical evolution.

A vivid picture is revealed of the particular richness these issues present in the Mediterranean. It is a complex geographical area which joins parts of three continents and is home to the most ancient and most modern populations, a vast range of biotopes and high biodiversity1, political harmonisation (for example in the European Union) as well as some zones of conflict—all of which exist side-by-side on a small part of the earth’s surface. In the past, the Mediterranean has been a crucible for the development of major civilisations, religions and empires. Now, perhaps, the same might be true of the region’s role in discovering enlightened and imaginative ways forward in meeting our shared challenges in the future.

Integration in Mediterranean wetlands

This book has concentrated on wetlands. An analogous story could be woven around the links between human culture and many other types of ecosystems, although there may be ways in which wetlands are the most fundamental and representative example of all. The papers included in this volume illustrate the fundamental interdependence between people and wetlands, most crucially of all in respect to the essential role of water in supporting all life-forms and—indeed—in supporting the planet’s function as a home for life. As documented in this book, the diversity with which this life manifests itself is remarkable.

1 It has been recognised by WWF International as a priority global eco-region.
That said, what is provided here does no more than provide a window on these issues. It does not necessarily claim to be representative, or to have achieved any particular kind of balance. Rather, its purpose has been to reveal, celebrate, examine and inspire, and we hope it will serve as a stimulus for heightening the attention paid to the issues at every level.

The Mediterranean region is blessed with a number of institutional and technical structures which offer good platforms for co-operation and effective action. The European Union, the League of Arab States, the Barcelona Convention and the Mediterranean Action Plan (UNEP/MAP), the MedWet Initiative and the Mediterranean Wetland Committee of the Ramsar Convention, as well as the regional offices of international NGOs such as BirdLife International, IUCN and WWF International are all promising examples of institutions and organisations that can help, if properly motivated.

Good implementation in the Mediterranean is also a litmus test for the effectiveness of the relevant global frameworks. The conventions on biodiversity, climate change, desertification and others all have very important roles to play. The World Heritage Convention is obviously of special relevance in strengthening the links between culture and nature, along with UNESCO’s Man and the Biosphere programme and its network of Biosphere Reserves.

Pre-eminent among the above is the Ramsar Convention, hence the emphasis in this book on the evolution of its attention to cultural issues in a wetland and water management context. As already mentioned, over the past decade the Ramsar Convention has played a pioneering role in introducing cultural aspects and values into wetland conservation and management through two major resolutions.

Ramsar is probably best placed to be a source of well-articulated key principles, and to provide leadership and co-ordination of the different interests involved.

The way forward

Substantial work has been done over the past ten years in bringing to the fore the major issue of an integrated approach to the natural and cultural heritage of wetlands. During the second decade of the twenty-first century, there is still a phenomenal amount to be done if rapid progress is to be made, and if what has been gained thus far is to be secured.

It would perhaps be a good thing to review the Ramsar Guidance in 2011-2012 in the light, among other things, of the suggestions made in this book, and the results of this should be widely disseminated. Efforts being made to implement the suggested objectives and actions in regions beyond the Mediterranean could be greatly strengthened with the support of the Ramsar Scientific and Technical Review Panel and the Culture Working Group.

As reported in section 6.1 above, the ‘lessons learned’ indicate areas of opportunity, as well as problems that need to be dealt with through concerted action at both the national and international level.

From a technical point of view, collecting additional examples of experiences from around the world, and lessons about good and bad practices, could provide tangible case studies of failures and successes. These could be complemented by an analysis of the needs of different stakeholders for information, advice tools and overall support. Knowledge should be organised to make it optimally accessible through appropriate knowledge-sharing and publishing (in print or electronically), with translation into key Mediterranean languages (including Arabic) and support in popularising the issues as required. A key role in integrated knowledge management must be identified for academic and research institutions, but conservation research priorities also need to draw engagement from a broader circle of stakeholders.

From a policy point of view, a first important step would be integrated policy advocacy, with social scientists and environment experts propounding joint agendas, talking together and coherently to governments on major wetland issues. This could lead to policy improvements at the national level, in particular, which could have a broad impact across the sectors dealing with development, infrastructure, urbanisation and tourism, agriculture, water management and education.

Such policy improvements could be facilitated or brought about by corresponding positive developments within the framework provided by international multilateral
agreements, among which the Ramsar Convention, as indicated, should play a key role, including refocusing the activities of its Culture Working Group.

In the Mediterranean, there is still a great need to monitor, assess, report and organise responses to problems concerning integrated approaches to wetlands. The recently re-established MedWet Culture Network could take on these tasks in collaboration with the Mediterranean Wetland Observatory at Tour du Valat, Med-INA and other partners. The Network should establish a forum on these issues, and open up the discussion at the level of national and local NGOs. The ‘Grado+20’ Symposium planned for Morocco in February 2012 could provide a unique opportunity to develop the message of integration with a broad Mediterranean audience.

This book provides a snapshot of perspectives from an immensely dynamic and challenging period. In a sense, despite the title of this chapter, there is no ‘conclusion’. The title of the book itself is truer: the story continues to evolve...
Annexes

Annex I: Prespa Statement on ‘an integrated approach to the cultural and natural values of Mediterranean wetlands’

In the Greek part of the Prespa Lakes, 35 experts from 17 countries met on 23-27 September 2009 to analyse and discuss the possibility and modalities of a common approach to the natural and cultural heritage of Mediterranean wetlands that would result in creating synergies and building consensus.

At the end of the Workshop¹, the participants agreed on the following statement:

1. Taking into account the continuing loss and degradation of Mediterranean wetlands due to a variety of factors such as increasing population and tourism pressures, economic development of coastal areas and resulting land use changes, water resources overexploitation and pollution, as well as major threats associated with climate change including sea level rise, increased temperatures and reduced precipitation;

2. Realising the mutual dependence of the cultural and natural aspects of wetlands, with these ecosystems providing important resources and services to human beings, but often not being properly understood, appreciated and utilised sustainably;

3. Considering that wetland conservation in the Mediterranean Basin depends not only on ecological and scientific considerations, but critically also on human beings and their ethical, cultural and economic values, at all levels, from the local to the international, and that this relationship must be faced in a positive –and not in a negative– manner;

4. It has become clear that an integrated approach to both the natural and cultural heritage of wetlands will improve understanding of the situation and will significantly benefit the conservation of both aspects of heritage. Cultural heritage is taken to mean all the works of human beings, tangible and intangible, from the grand to the vernacular. Such an approach would require a number of challenging initiatives during the coming years, and these are summarised below.

5. A dialogue must be established between cultural heritage experts and those responsible for wetland management in order to: (a) understand better the


< Fig 6.3 Traditional dances in Sečovlje Salina.
requirements of both sectors (b) develop a common language and (c) ultimately agree on common objectives.

6. The integration of cultural heritage expertise in wetland management efforts must be ensured, as well as ensuring its contribution to the preparation of management plans and the operation of management bodies.

7. The links between natural and cultural heritage (including sacred and religious aspects) must be further studied and communicated among local inhabitants, responsible authorities, visitors and other stakeholders.

8. Local knowledge about the tangible and intangible aspects of wetlands – be they historical, traditional or contemporary – must be preserved through systematic documentation, and must be taken seriously into account.

9. Such knowledge can lead to a more flexible and site-specific management of sites, avoiding generalised practices which may not be appropriate to individual cases.

10. The material, cultural and spiritual needs of local communities must be studied and given significant weight in management decisions.

11. The co-ordinated and integrated presentation of the cultural and natural heritage of wetland sites may, in turn, provide important benefits for both local communities and visitors, and may significantly raise their awareness about wetland conservation.

12. The guidance on culture and wetlands provided by the Ramsar Convention\(^2\) should be widely promoted and used by wetland managers and others in their day-to-day activities. Experience in its use should be documented and reviewed, in order to refine and develop its application to specific Mediterranean contexts.

13. There is a strong need for a framework of co-operation in the Mediterranean Basin on efforts to integrate the approach to the conservation of natural and cultural values of wetlands. Such a framework could be provided by the MedWet Initiative and its Culture Network.

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\(^2\) See www.ramsar.org under Activities / Culture and Wetlands / Documents.
Annex II: Additions to Ramsar Guidance

From the recent work carried out in the Mediterranean, a number of additional objectives are proposed for incorporation in the next revision of the Ramsar Guidance on Culture and Wetlands1.

Chapter 3: Primary use of wetland resources

**O.2.1+2.2 – NEW**
To optimise the mutual benefits between agriculture and stock breeding and wetland management

To optimise services of wetlands to the agricultural sector and to maximise benefits to wetland conservation from agricultural activities, the following actions are proposed:

a) identify and analyse traditional agricultural and stock breeding practices around wetlands and learn from their experience;

b) maintain a high quality of freshwater in wetlands, so that they can be used for irrigation and watering animals, while setting sustainable limits for allowable water abstraction;

c) maximise the collection of fodder from wetland biomass, within appropriate conservation standards; and

d) manage animal grazing with compatible conservation and stock-breeding objectives.

**O.2.5 – NEW**
To ensure the sustainability and ecological compatibility of hunting in wetlands.

To provide acceptable guidelines for hunting in wetlands, the following is proposed:

a) assign and enforce sustainable limits on subsistence hunting in wetlands and allow it only for local communities in developing countries;

b) provide effective limitations to sports hunting, concerning zoning of sites, period of hunting, species allowed, size of catches and hunting methods to be used;

c) allow hunting only with steel pellets in wetlands;

d) forbid landscape changes to maximise hunting potential; and

e) enhance the cultural potential of hunting.

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1 Planned for 2012 by the Ramsar Culture Working Group.
Chapter 4: Secondary use of wetland resources

**To promote gastronomy based on wetland products**
The following actions are proposed:
a) collect traditional and contemporary recipes based on products related to wetlands;
b) have these recipes tested at gastronomy schools;
c) disseminate the results through appropriate communications and publications;
d) encourage restaurants in the vicinity of wetlands to include such recipes in their menus;
e) encourage tourism professionals to incorporate in their service packages culinary tours based on wetland gastronomy; and
f) convince operators of wetland visitor centres to include information on gastronomy in their exhibitions and published material.

**To manage sustainable visitor / tourist activities in wetlands**
The following actions are suggested:
a) identify all tourism, sports and leisure activities in wetlands, and assess their environmental impact;
b) estimate the carrying capacity of wetland areas for each activity and determine optimal upper limits;
c) develop regulations for each activity and the means to implement them, including enforcement, within the framework of management planning;
d) determine appropriate payments for services rendered;
e) provide conservation information to all visitors in a sensitive manner, including the cultural heritage of the site; and
f) market the visitor potential of the site by stressing its integrated natural and cultural heritage.

**To use secular events in order to increase wetland knowledge and promote integrated conservation efforts**
The following actions are suggested:
a) carry out an inventory of recurring social events and activities directly or indirectly related to wetlands;
b) assess the feasibility of turning such events towards wetland conservation and wise use, or at least of delivering a strong conservation message;

c) identify social groups sensitive to cultural and environmental matters, and with a record of social activism;

d) plan carefully the wetland-related message in conjunction with the main event organisers;

e) implement the activities planned; and

f) evaluate the results obtained and incorporate lessons learned and feedback for the next occurrence of each event.
A.III Short CVs of contributors

Giorgio Andrian

Dr Giorgio Andrian is a forester with a masters degree in Development Cooperation and a Ph.D. in Political Geography. Having begun his career in the field of development cooperation, and combining studies at the postgraduate level with work in Africa and Latin America, he worked in Central and Eastern Europe before acquiring his doctorate in Germany. His thesis refines the epistemology of local development by means of a systemic approach to understanding relational aspects of the various stakeholders; working in Management Planning (and its tourism components), he was soon putting his studies into practice. Since he joined UNESCO’s Venice Office in 2004, he has also become interested in internationally designated sites. He currently combines work in the field (mostly in transboundary UNESCO related sites) with lecturing on Political and Cultural Geography, International Relations and Nature, and Cultural Heritage Conservation Policies at a graduate and undergraduate level at various European universities. He has also obtained a Certificate of Advanced Studies in Environmental Diplomacy from Geneva University.

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Abdelhamid Belemlih

Abdelhamid Belemlih trained as a veterinarian at the University of Lyon and then as a biologist at Blaise Pascal University in Clermont-Ferrand. Abdelhamid Belemlih is currently a professor at the Institut Agronomique et Vétérinaire Hassan II in Rabat, Morocco. He is also president of the Society for the Protection of Animals and Nature (SPANA/Maroc), a Moroccan NGO that works in close collaboration with the British Society for the Protection of Animals Abroad (SPANA/UK). In 1986, Professor Belemlih provided the impetus for the development of a programme of nature protection and environmental education with which both organisations have supplemented their animal protection activities. The programme was developed in collaboration and partnership with, and with the assistance of, the Moroccan government and national and international institutions including the World Bank, the EU, the IUCN and BirdLife International. Professor Belemlih is currently developing a culture and nature project at the National Centre of Education attached to the Sidi Boughaba wetland, a natural and cultural heritage site of national and international importance.

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Nejib Benessaiah

Nejib Benessaiah is an architect and urban planner who trained in Paris and Montpellier. Since 1986, he has collaborated with the United Nations Centre for Human Settlements-Habitat in many parts of sub-Saharan Africa as a Chief Technical Advisor. In August 2001, he was appointed Policy Advisor by the Ramsar Convention Bureau to the new MedWet Co-ordination Unit established in Athens. Involved in MedWet since 1996, and particularly with the MedWet2 project on socio-economic issues, he is the author of Mediterranean Wetlands: Socio-economic Aspects, published in 1998 by DG XI, European Commission for the Ramsar Convention. He has been very active in launching and facilitating the establishment of the North African Wetlands Network with the participation of Morocco, Algeria, Tunisia, Libya and Egypt, and has assisted in the preparation of all Mediterranean Wet-
lands Committees, especially the MedCom3 in Djerba, Tunisia. Appointed Interim Co-ordinator of MedWet in 2009, he has been its full Co-ordinator since January 2011.
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Sajmir Beqiraj
Sajmir Beqiraj received his Ph.D. in the Biological Sciences in 2004, and lectures in Hydrobiology, Aquatic Ecology and Invertebrate Zoology at the University of Tirana. He has conducted research in the fields of Marine Biology and Ecology, Macrobenthos, Coastal lagoons and Malacofauna, mainly in German and Italian research institutions and universities. He has published widely and participated as an expert, team leader and co-ordinator in numerous scientific and environmental projects, mostly relating to issues of biodiversity and environment conservation and monitoring, environmental impact assessment, and environmental policies, mainly in aquatic and wetland ecosystems. He has authored a number of scientific and environmental reports in the context of these projects. He has represented Albania in the Group of Experts of the European Council for the Conservation of Invertebrates in Strasbourg since 2003, was the winner of the Young Investigator Award at the European Congress of Malacological Societies in 2005, is a member of the Italian Malacological Society (SIM), sits on the board of GEF/SGP Albania (Global Environmental Facility/Small Grant Projects), is a member of the International Association of Biological Oceanography (IABO), a leader in the Albanian Network for the Study of Marine and Lagoon Ecosystems (MarLagunAlb) and has been leader of the Association for the Protection of Aquatic Wildlife of Albania (APAWA) since 1999.
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Vanja Debeveč-Gerjevič
Vanja Debeveč-Gerjevič studied Biology at the University of Ljubljana, from where she also received her Masters degree on the functional aspects of the cave environment impacts on man. Having worked for the Institute for Public Health Protection in the Department of Ecology in Ljubljana, she was appointed head of the clinical laboratory at Sežana Hospital. She has been working for the Skocjan Caves Park in Slovenia since 1999, initially as head of the Research and Development department, and currently in the field of environmental education as a co-ordinator of the Park’s international schools network. Her areas of special interest are researching the anthropogenic impact on cave microclimate, the carrying capacity of protected areas, communicating protected areas, and articulating and implementing the Park’s international designations. She has participated in several international projects and worked as a project co-ordinator on EU and Ramsar projects, which have resulted in long-term ongoing activities in the Park. She has written several articles on environmental education and park monitoring. She is currently on the board of the Permanent Commission of Speleotherapy, having served as its Secretary General during 1997-2008. She is a member of the Slovene National MAB Committee, the Ramsar National Committee, and the Slovenian National Commission for UNESCO. She is a member of the International Advisory Committee for Biosphere Reserves for the period 2011 - 2014.
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Zamir Dedej
Zamir Dedej is a biologist. Having received his Masters degree in Marine Ecology from the University of Tirana, he presented his Ph.D. thesis at the same institution on the distri-
bution and dynamics of microalgae on the Albanian coast. He worked at the Institute of Biological Research (Albanian Academy of Sciences) as a marine biologist until 1998, and later served as Director of Nature Protection at the Ministry of the Environment. Since 2007, he has been the director of the Institute of Nature Conservation in Albania-INCA, an NGO. He has served as chairman of the Committee for Biological Diversity and Landscape of the Council of Europe (2005-2007), and has been a member of the Bureau of the CBD COP (2004-2006) and of the trilateral Co-ordination Committee for the Transboundary Prespa Park (2000-2007). He also served as the Albanian Focal Point for the main conventions and protocols regarding nature protection (CBD, Ramsar, Bern Convention, RAC/SPA of UNEP/MAP, etc.). He has been working as a biodiversity expert over the last two years, and sits on the Scientific Council for the European Centre of Nature (2009-2011). He has considerable experience on many international projects including the World Bank Lake Ohrid Conservation Project, the World Bank Forest Project, the GEF/UNDP MedWet Coast Project, the INTERREG II and III Program Italy-Albania, the National Environmental Action Plan and the Emerald Network project.

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Selim Erdoğan holds a B.Sc. in Hydrogeology from Hacettepe University, an M.Sc in Karst Hydrogeology from the same university and a Ph.D. on the Ramsar Convention from Ankara University (Department of Environmental Sciences). He worked as a research assistant at Hacettepe University until 2000, when he moved to the Ministry of Environment (Wetlands Division). He was national focal point for the Ramsar Convention and MedWet until 2006. He is currently working in the National Parks Department as head of the Cave Research Unit. He has been involved in numerous national and international wetland projects, including the management plans of the Gediz Delta Ramsar Site and the Ballica Cave Nature Park, on which he worked as project co-ordinator.

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Dr Moustafa Fouda is Director of the Nature Conservation Sector (NCS) of the Egyptian Environmental Affairs Agency. His work involves implementing the National Biodiversity
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Julian Hoffman

Julian Hoffman is a writer and naturalist living in Prespa, Greece. Although born in the North East of England, he grew up and studied literature in Canada. In 2000, he moved to the small mountain village of Agios Germanos overlooking the Prespa Lakes. Much of his writing is concerned with the connections between the human and non-human world; in particular, the relationships forged with landscape and place. His fiction and essays have appeared, or are forthcoming, in the Beloit Fiction Journal, Terrain.org: A Journal of the Built and Natural Environments, The LBJ: Avian Life, Literary Arts, The MacGuffin, Canary Journal and The Redwood Coast Review.

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Peter Howard is a geographer from the UK. Educated at the University of Newcastle upon Tyne in the 1960s, he acquired his Ph.D. on landscapes selected by artists while at Exeter College of Art in the 1970s. He undertook the editorship of the Landscape Research Journal through the 1980s, and remains the International Officer for Landscape Research Group. As the Art College merged with Plymouth University, he expanded his landscape work into a wider field of heritage studies in what was only the second heritage course in the UK, and founded the International Journal of Heritage Studies, which he continued to edit until his retirement in 2004. Thereafter, he worked on the Ashgate Research Companion into Heritage and Identity (2008) with Brian Graham. His publications include The Artists’ Vision (Routledge, 1991), Heritage: management, interpretation, identity, (Continuum, 2003) and a work co-authored with Thymio Papayannis: Natural Heritage: at the Interface of Nature and Culture (Routledge, 2007). He is now Visiting Professor of Cultural Landscape at Bournemouth University.

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Katia Hueso holds an M.Sc. in Biology from Leiden University, the Netherlands, and other postgraduate degrees in Environmental Management and Engineering from the Escuela de
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Yannis Kazoglou graduated from the School of Agricultural Engineering at the Aristotle University of Thessaloniki and holds a Ph.D. in Rangeland Ecology from the School of Forestry and Natural Environment at the same institution. He has been working for the Society for the Protection of Prespa (SPP) since 1997 on projects which have focused on the restoration of wet meadows in Lesser Prespa Lake. This conservation-oriented research project, which affects the lives of people from the three nations bordering Prespa and includes policy, communication and conservation aspects, led to a very successful LIFE-Nature project (2002-2007). After 2008, he co-ordinated SPP projects on the mapping of Natura 2000 habitat types in Prespa National Park and research on the bats of transboundary Prespa. He has lectured (2007-2010) on Rangeland Science and Protected Areas at the Technological Educational Institute of Larisa (Department of Forestry and Management of the Natural Environment) and is currently scientific collaborator of the Municipality of Prespa.

Manos Koutrakis

Dr Manos Koutrakis is a biologist-ichthyologist. He has been a researcher at the Hellenic Fisheries Research Institute (National Agricultural Research Foundation) since 1996, and is currently head of its Lagoons and Inland Waters Laboratory. His Ph.D. thesis deals with the biology and population dynamics of grey mullet in an estuarine system in the North Aegean. His experience over the last 20 years has encompassed fish biology, fish fauna and assemblages, the interaction of cetaceans with fisheries, crayfish, the management of lagoons and wetlands, eco-hydrology and Integrated Coastal Zone Management. He has authored a large number of publications, several of which are included in the Science Citation Index. He is also a reviewer on several international peer-reviewed scientific journals. He has served as co-ordinator for EU and national research projects, and participated in the Ecohydrology (UNESCO/UNDP) task force for coastal zones. He is also an expert on the European Commission’s Scientific, Technical and Economic Committee for Fisheries, and a member of the research needs subgroup. He is currently working with the fish fauna of the Nestos River, and with fish fauna as an indicator of water quality in transitional waters (lagoons, estuaries) in northern Greece.

Mauro Lenzi

Dr M. Lenzi is an ecologist who graduated from the University of Pisa, Italy. He is currently directing the research activities of the Lagoon Ecology and Aquaculture Laboratory (LEALab) for the Orbetello Pesca Lagunare Company. His interests include the controlling of submerged vegetation development and the forecasting and prevention of dystrophic risks in the
lagoon environment; the bio-geo-chemistry of coastal sediment; biological tools for lagoon environment management; assessing the meadow state of *Posidonia oceanica* and quantifying its human impact; and reducing the eutrophic impact of fish-farm wastewater. He has taught at the universities of Siena, Pisa and Rome and cooperated with Grosseto University Pole, the universities of Florence, Parma and Venice, the Central Institute for Marine Research in Rome (ICRAM, now ISPRA), WWF-Italy, the Regional Agency for Tuscan Environmental Protection (ARPAT), FAO-Rome, the Italian National Research Council (CNR), the Italian National Agency for New Technology (ENEA), the Italian Health High Institute (ISS) and the Orbetello Lagoon Environmental Reclamation Authority. He has been a member of the Italian Society of Marine Biology (SiBM) since 1985, was a member of the Maremma Regional Natural Park Council between 1996-99, and was a founding member of the Italian Network for Lagoon Research (LAGUNET) in 2006. He has also authored a large number of papers.

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**Irini Lyratzaki**

Irini Lyratzaki studied Economics and Tourism at the Technological Educational Institute of Heraklion, Crete, and Social Anthropology and Social Policy at the Panteion University of Athens. She worked in the tourist sector for several years, and later at the Museum of Cretan Ethnology. Employed in the Med-INA Scientific Secretariat since 2004, she has been involved in projects related mostly to an integrated approach to the cultural and natural heritage of wetlands and sacred natural sites in developed countries. She is a member of the Working Group of the Delos Initiative, a project of the IUCN WCPA Specialist Group on the Cultural and Spiritual Values of Protected Areas.

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**Josep-Maria Mallarach**

Josep-Maria Mallarach has been involved in the planning, management and evaluation of protected areas, systems of protected areas, and strategies for nature conservation for a quarter century in both Europe and North America. A member of the World Commission of Protected Areas, he is a joint co-ordinator of the Delos Initiative (together with Thymio Papayannis), and director of the Silene Association, a non-profit organisation which promotes the intangible values of nature. He is also a member of the Steering Committee of the IUCN WCPA Specialist Group on Cultural and Spiritual Values of Protected Areas. He has authored and/or edited many books and papers on protected areas and nature conservation, the most recent of which have dealt with the intangible cultural heritage of nature.

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**Myrsini Malacou**

Myrsini Malacou is a biologist who works mainly in the fields of biodiversity, habitat and species conservation. Since 1991, she has been managing director of the Society for the Protection of Prespa (SPP), whose focus is primarily on the conservation and management of protected species and habitats, the promotion of institutional development and policy measures, the implementation of sustainable development projects, initiating and promoting transboundary cooperation in the Prespa Transboundary Park and –last but not least– pinpointing the importance of, and strengthening the relationship between, Prespa’s natural and cultural values. The latter goal has resulted in the establishment of the Prespa Centre for Man and Nature.

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Jean-Yves Mondain-Monval

Jean-Yves Mondain-Monval worked as a research officer at the F.-A Forel Institute in Switzerland, where he contributed to an international monitoring programme for the water quality of Lake Geneva and the Rhône. He also worked with the International Waterfowl Research Bureau (now Wetlands International), where he helped develop the International Waterbird Census. He currently works for the Office national de la chasse et de la faune sauvage [Game and Wildlife Agency] of the French Ministry of Ecology. Based in the Camargue at the Station Biologique de la Tour du Valat, he heads a research programme into hunting and related marsh management practices. He is also in charge of developing co-operative capacity for building projects concerning water birds and wetland monitoring in Africa. He has served as a consultant on wetlands conservation projects for the European Commission as part of an international team based in Tour du Valat. He has also served as an assistant director at the Garoua Wildlife School in Cameroon, where he trained future nature reserve and wildlife managers.

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Popi Nalpantidou

Popi Nalpantidou is a professional tour guide. She received her diploma from the National Tour Guide school on Corfu, Greece. The main subjects of her study were Archaeology, History and the History of Art. She has worked at the Information Centre of the Society for the Protection of Prespa as an eco-guide, and from 2005 to 2010 she was the co-ordinator of the Public Awareness sector of the Society for the Protection of Prespa. She has participated in a number of seminars and conferences related to tourism development, environmental education and local history.

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Thymio Papayannis

A successful architect and town planner, he has dedicated most of his activities over the past 25 years to the conservation of nature and to environmental and sustainability issues. In 2009, he was awarded an honorary doctorate by Athens Agricultural University for his contribution to the environmental sector. He was one of the two founders of WWF Greece, whose president he was 1996-2004, 2005-2006 and since 2009. He is also the founder—and president—of the Society for the Protection of Prespa, and contributed to the establishment of the Greek Biotope-Wetland Centre. He has served on the boards of WWF International and the Tour du Valat and Sansouire foundations in the Camargue. In 2009, WWF International nominated him a Member of Honour. His most important activities include establishing and co-ordinating MedWet (Mediterranean Wetlands Initiative of the Ramsar Convention), co-ordinating the Ramsar Culture Working Group and the IUCN Delos initiative, and directing Med-INA (the Mediterranean Institute on Nature and Anthropos). He has also been involved with the ecological work of the Ecumenical Patriarchate and the Holy Community of Mount Athos. He has written a large number of articles, chapters and books on architecture and planning, nature conservation, the environment and sustainability.

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George Parisopoulos

George Parisopoulos is a civil engineer who graduated from the University of Thessaloniki, Greece before undertaking post graduate studies in Hydrology and Environmental Engineering at Imperial College, London in the UK. Early in his career, he designed and supervised the
construction of irrigation projects. Since 1992, he has been a researcher at the National Agricultural Research Foundation, where he has been involved in numerous projects in collaboration with universities and consulting companies, and has published widely in international scientific journals and conference proceedings. Over the past nine years, he has co-operated closely with the Society for the Protection of Prespa on water management issues in the Prespa Park. He is also a deputy member of the Greek National Water Board and president of the Prespa National Forest Management Body. His current professional and research activities relate to water resource and environmental management, catchment hydrology, the design of hydraulic projects, the design of natural waste-water treatment systems, the re-use of treated effluents and Environmental Impact Assessments.

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Theodora Petanidou is a professor in the Department of Geography at the University of the Aegean, Greece. She has studied Pharmacy and Biology and has a Ph.D. in Ecology. Her research interests include pollination ecology, natural resources conservation, Mediterranean eco-geography and cultural ecology. Over the last 25 years, she has worked extensively with Mediterranean ecosystems and salinas. Her work on pollination ecology focuses mainly on the biodiversity, structure and function of plant pollinator Mediterranean communities, on the diversity of pollinators and the threats facing them, and the eco-physiology of floral rewards, especially nectar. She has worked and taught at several universities in Europe and America, and published numerous scientific articles in peer-reviewed journals. Interested in salt and salinas for over two decades, she has published widely in scientific and popular journals and published a bilingual book entitled Salt: Salt in European History and Civilization (Hellenic Saltworks S.A., 1997) and edited a further three volumes on the same subject.

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Dave Pritchard

Dave Pritchard is an independent consultant with 25 years of experience in national and international policy and law with bodies including the Ramsar Convention, the Biodiversity Convention, the Foundation for International Environmental Law and Development and UNESCO. He is a former non-executive director of both Wetlands International and the UK Government’s Joint Nature Conservation Committee, whose Audit and Risk Management Committee he currently chairs. As one of the longest-serving members of the Ramsar Convention’s Scientific and Technical Review Panel, he currently chairs its working group on assessment, monitoring and reporting. He also serves on the Culture Working Group of the Ramsar Convention and on the IUCN Specialist Group on Cultural and Spiritual Values of Protected Areas. In the UK, he chairs the Arts and Environment Network, is a Trustee of the Centre for Contemporary Art and the Natural World, and Vice-Chair of Bedford Creative Arts. He was awarded the Wetland Conservation Award in 2008.

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Ma‘en Smadi

Ma‘en Ahmad Al Smadi is an Agricultural Engineer. He graduated from Baghdad University in Iraq, and has also studied Ecology and Protected Areas Management Planning. He has worked as a manager of poultry production farms for the Suliman Amayra Poultry Company, and was head assistant in the Law Enforcement Section of the Royal Society for the Conservation of Nature in Amman, Jordan. He is currently head of protected areas, and is responsible for managing Jordan’s six nature reserves in close cooperation with the reserves’ managers. His main duty is to ensure that the RSCN’s strategic objectives for these reserves are met, to ensure their effective management, to provide PA managers with the technical back-up and support they need, and to evaluate their performance.

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Aphrodite Sorotou

Aphrodite Sorotou studied Archaeology at University College, London, and obtained her M.Sc. in the Theory and History of International Relations at the University of London’s School of Economics and Political Science. Her main interests relate to the harmonious relationship between nature and culture, and the way this relation is manifested in the study of landscape. Since 2003, she has been a founding member and head of the scientific secretariat of the Mediterranean Institute for Nature and Anthropos and the co-ordinator of the ‘Conservation and management of Greek landscapes’ programme. She has also managed projects for EC programmes, mainly within the CULTURE 2000 framework.

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Andrej Sovinc

Andrej Sovinc has a B.Sc. in Civil Engineering and a Masters in Natural Heritage Protection. He designed wetland and river restoration projects at the Water Management Institute in Ljubljana, 1992-2002. Between 1995 and 2004, he acted as the European Coordinator of the IUCN Park for Life Action Plan for Protected Areas in Europe. Since 2002, he has been director of the Sečovlje Salina Nature Park in Slovenia. Over the last few years, he has been employed on a part-time basis as an assistant in the Institute of Biodiversity at the University of Koper/Capodistria. He is also an ornithologist, and has written several articles and books on birds, including the *Atlas of Wintering Birds of Slovenia*.

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Theotokis Theodoulou studied Archaeology, History of Art and Ancient History at the University of Athens. He received his MA from the Panteion University, Athens, in Cultural Policy, Administration and Communication and his Ph.D. from the University of Cyprus, where his thesis addressed the maritime activity and harbour network of classical Cyprus. He has taken part in several terrestrial and underwater archaeological missions and excavations in Greece, Cyprus and Egypt using cutting-edge technology developed by relevant technology advancing institutions (such as the Woods Hole Oceanographic Institute and the Hellenic Center for Marine Research). He co-ordinated the Hellenic Institute of Marine Archaeology team in the context of the European Navis II project, and is an associate of the National Technical University of Athens responsible for developing the Limenoscope database. He has published several articles in archaeological journals and volumes. He has also taught Marine History and Underwater Archaeology at the University of Aegean as part of a programme conducted jointly by the university, the Hellenic Centre of Marine Research and the University of Connecticut. Since 2000, he has been employed as a marine archaeologist in the Greek Ephorate of Underwater Antiquities, whose regional office in Heraklion, Crete, he currently heads.
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A citizen of Niger, Anada Tiéga earned his B.Sc. from the University of Niamey and his M.Sc. in Forest Watershed Management from the University of Arizona in the US. He has many years of experience in wetland conservation and sustainable use both at the local level and internationally, and has a strong record of successfully co-ordinating large groups of government officials, donors, regional collaborative commissions, environmental NGOs and field scientists and practitioners. He served for some years in the environmental administration of Niger, including a stint as National Director of Wildlife and Fisheries, following which he worked for the World Conservation Union (IUCN), first in Niger then as Regional Co-ordinator for West Africa. In 1998, he became the Ramsar Convention Regional Co-ordinator for Africa, based at the convention’s headquarters in Gland, Switzerland. Between 2003 and 2007, he was project manager for the Lake Chad Basin GEF project relating to the ‘Reversal of Land and Water Degradation Trends in the Lake Chad Basin Ecosystem’, based in N’Djamena, Chad. Since August 2007, he has been Sec-
Secretary General of the Ramsar Convention; in this post, he has taken on a position of strategic leadership to guarantee the implementation of the Convention, and has worked to secure sustainable development by ensuring that the Contracting Parties are fully engaged and working in partnership with other conventions.
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**Jaroslav Vego**

Professor Jaroslav Vego is an architect. He has taught at a number of universities since 1993, including the University of Mostar, Bosnia and Herzegovina, in the departments of Civil Engineering (since 1993) and History of Art and Archaeology (since 2001); the University of Split, Croatia (since 2007); the Università degli Studi di Udine, Politecnico di Bari, Università degli Studi di Firenze, the Rete Uniadrion and Universita degli Studi di Urbino ‘Carlo Bo’ (since 2006) in Italy; and at Prague University in the Czech Republic. His international experience include stints in the Ministry of Civil Engineering, Physical Planning and Environmental Protection in Herzegovina-Neretva, the Physical Planning and Environmental Protection Institute (as a Manager, since 2003), the Baudirektion Kanton Zurich, Switzerland, and the Ramsar Convention as the National Focal Point for Bosnia and Herzegovina (since 1997). He has also taken part in a large number of international conferences.
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Violeta Zuna has a B.Sc. in Industrial Chemistry from Tirana University, Albania, an MBA and a Ph.D. in Scientific Food Research. She worked as a researcher at the Albanian Food Research Institute, 1986-1998. She has also lectured on Food Chemistry and Environmental Chemistry. Since 1998, she has been primarily engaged with the environment. She worked with the Albanian National Environmental Agency until 2001, and then as project manager with UNDP Albania on a number of projects including the Conservation of Coastal and Marine Ecosystems in the Mediterranean project, which focused on the ecosystems of Narta, Orikum, Karaburuni, Llogara and Sazani; the Integrated Ecosystem of Prespa Lakes Basin in Albania, FYR Macedonia and Greece project, which concerned the integrated management of the transboundary ecosystem of Prespa; and the Protected Areas Gap Assessment and Marine Protected Areas Development in Albania project, which assessed the current situation in the country related to protected areas with a view to enabling the establishment of its first protected marine area.
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6.1 Thymio Papayannis
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Med-INA

The Mediterranean Institute for Nature and Anthropos (Med-INA) is a non-profit organisation with an international mandate. It was legally established in Greece in 2003. Its main aim is to contribute to a harmonious relationship between Anthropos (humankind) and Nature, by working on the interface between the two through research, action and public awareness. Focused on the Mediterranean Region, its priority areas of research and action are the following:

Cultural values of wetlands

Operating within the framework of the Ramsar Convention on Wetlands (Ramsar, 1971), Med-INA has been working to incorporate cultural values in the management of wetlands. For millennia, human beings have co-existed with nature, which provided resources for survival and the development of societies and cultures in the Mediterranean. The weakening of this relationship has led to the degradation of ecosystems and the loss of the services and values of Mediterranean wetlands. Med-INA is working to reconnect people with wetlands and to ensure a more sustainable future. It incorporates the study and promotion of cultural values in its management and has actively supported the Ramsar Culture Working Group and played a key role in developing the Ramsar Guidance on Culture and wetlands.

Sacred natural sites

The Delos Initiative seeks to study and promote the possibilities of synergy in the conservation of the spiritual, cultural and natural heritage of protected areas in developed countries. A Med-INA proposal, the Initiative was developed in the framework of the Specialist Group on Cultural and Spiritual Values of Protected Areas (CSVPA), within the IUCN World Commission on Protected Areas (IUCN/WCPA), with a view to maintaining both the sanctity and the biodiversity of these sites. Med-INA undertakes the day-to-day running of the Initiative, has staged workshops in collaboration with the Silence Association, Spain, and has helped coordinate the related publications.

Landschafts

Intimately linked to natural and cultural heritage, landscapes are a key factor in individual and social well-being. In recent years, various destructive human activities, including urbanisation and large-scale constructions, have had a negative impact on landscapes. Med-INA studies and promotes landscape management and conservation issues in Greece and the Mediterranean, applying innovative landscape methodologies that can help tackle key environmental issues, empower community participation, enhance local identity and biodiversity.

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