

## World Heritage Sites

### Protected Areas and World Heritage



## NATURAL AND CULTURAL HERITAGE OF THE OHRID REGION THE FORMER YUGOSLAV REPUBLIC OF MACEDONIA

*Situated on the shores of Lake Ohrid, the town of Ohrid is one of the oldest human settlements in Europe. Built mainly between the 7th and 19th centuries, it has the oldest Slav monastery (St Pantelejmon) and more than 800 Byzantine-style icons dating from the 11th to the end of the 14th century. After those of the Tretyakov Gallery in Moscow, this is considered to be the most important collection of icons in the world. Lake Ohrid, the major part of the protected area, is one of the oldest lakes in the world and, having very pure water, is a natural museum of relict freshwater organisms from the Tertiary period, whose close relatives can be found only as fossils.*

*Threats to the site: Uncontrolled pollution from two countries and a variety of sources, including continuing development along the lake shores, threatens eutrophication of the previously clear waters.*

### COUNTRY

The Former Yugoslav Republic of Macedonia

### NAME

Natural and Cultural Heritage of the Ohrid Region

### MIXED NATURAL & CULTURAL WORLD HERITAGE SITE

1979: Lake Ohrid inscribed on the World Heritage List in 1979 under Natural Criterion vii.

1980: Extended to include the historic area of the town under Cultural Criteria i, iii and iv.

### STATEMENT OF OUTSTANDING UNIVERSAL VALUE [pending]

### IUCN MANAGEMENT CATEGORY

II National Park

### BIOGEOGRAPHICAL PROVINCE

Balkan Highlands (2.33.12).

### GEOGRAPHICAL LOCATION

Lake Ohrid is in far south-western Macedonia, one third of the lake being in Albania. Its southern shore is within 20 km of Greece. The town of Ohrid is on its northeast shore adjoining the Mt. Galichica National Park. The lake lies between 40° 54' to 41° 10' N and 20° 38' to 20° 48' E.

### DATES AND HISTORY OF ESTABLISHMENT

1958: The Macedonian section of Mount Galichica declared a National Park in NRM Gazette 31/58;

1998-2003: International bodies were formed to promote the transboundary protection of the lake.

### LAND TENURE

State, in Ohrid administrative region.

### AREA

24,400 ha (WDPA, 2008). 38,800 ha was cited in the original designation.

## ALTITUDE

695m (lake surface)

## PHYSICAL FEATURES

Ohrid is a very ancient lake, which lies in a deep trench formed by tectonic subsidence in the late Tertiary period 3.5 to 4 million years ago. It is 31km long by 14.5km wide, 289m deep with an average depth of 164m and an area of 358 sq.km, 229.9 sq.km of which are in the Macedonia. Its watershed of 3,921 sq.km extends over three countries. It draws almost half its water via shoreline or underwater springs from Lake Prespa which lies on the other side of Mount Galichica east of the lake. This lake, which is partly in Greece, is 158 meters higher in level, is almost as large as Lake Ohrid, and greatly enlarges the catchment area. The strongest spring, at Sveti Naum on the southeast coast of Lake Ohrid, has 15 outlets which spring above and 30 which rise below the water level, providing a quarter of the lake's total inflow. It is therefore fairly free from enriching sediments and is extremely clear, with a very slow water turnover rate of 60-70 years and temperatures at depth of around 6°C, conditions which until last century had not changed for millennia (MUPCE, 1998). However the catchment was enlarged by diversion of the Sateska river in the north into the lake. This was formerly a tributary of the main outflow stream, the Black Drim. It now contributes a high sediment load to the lake from riverbed sand and gravel workings. The town of Ohrid on the lake's northeast shore adjoins the National Park of Mt. Galichica, a massive ridge of porous limestone karst rising above the lake to 2255m, dividing Lake Ohrid from Lake Prespa.

## CLIMATE

The climate is temperate continental modified by Mediterranean influences and by the two large lakes. The mean mid-summer temperature is 19.6°C, and the winter temperature can fall to an average of 2.7°C, although the absolute maximum and minimum temperatures are 34.4°C and -17.2°C. The annual rainfall averages 759mm, falling mostly in winter. The average lake surface temperature is 27.5°C. Winds prevail from the north in winter and from the south or southeast in summer.

## VEGETATION

Despite creeping eutrophication, the lake is still oligotrophic. Its phytoplankton productivity is low because of the low concentration of phosphates and nitrates, most of its water coming from springs, and its shores, which are being cleared of reeds, being stony. The zooplankton is also low and monotonous in species composition. The littoral is nevertheless a rich biotope for waterbirds and young fish. These are flanked by belts dominated by *Potamogeton* and then by *Chara*, which rings the lake bed between 6-15m deep. Neighbouring Galichica National Park contains more than 1,500 species of plants on the slopes of Mount Galichica, amongst them numerous relict and at least 11 endemic forms (Atanasovski, 1998) and some 100 species of plants which are gathered for medical use (Avramoski *et al.*, 2003).

## FAUNA

Two main ecological communities are found in the lake: littoral or near shore and pelagic or offshore. As one of the oldest lakes in the world Lake Ohrid is a natural museum possessing endemic primeval flora and fauna extinct elsewhere. Its geographic isolation, and the unchanging nature of its environment have preserved large numbers of relict freshwater organisms from the Tertiary period in the pelagic zone, whose close relatives can be found only as fossils, and has encouraged prolific speciation among them. In this it resembles Lake Baikal on a much smaller scale. A very high proportion of its invertebrate species is endemic and includes freshwater shells, crabs and sponges, one being the round Lake Ohrid sponge *Ohridspongia rotunda*. 146 endemic species have been identified. Endemism among these species is 90% of snails, 88% of parasitic infusoria, 71% of flat worms, 66% of small crabs, and 60% of fish. Five of the endemic species are restricted even within the lake to micro-ecosystems. Ten of the lake's 17 fish species are endemic. They include the salmonids Lake Ohrid brown trout *Salmo letnica* and the belvica *Alburnus belvica* (VU). Other species include 12 Cyprinidae, 2 Cobitidae and one Anguillid.

The coastal wetlands provide habitat for hundreds of thousands of wintering waterbirds. The avifauna includes Dalmatian pelican *Pelecanus crispus* (VU), great white pelican *Pelecanus onocrotalus*, great cormorant *Phalacrocorax carbo sinensis*, pygmy cormorant *P. pygmeus*, European shag *P. aristotelis*, mute swan *Cygnus olor*, black-necked grebe *Podiceps nigricollis*, little grebe *Tachybaptus ruficollis*, red-crested pochard *Netta rufina*, common pochard *Aythya ferina*, ferruginous duck *A. nyroca*, tufted duck *A. fuligula* and corncrake *Crex crex*. Raptors include griffon vulture *Gyps fulvus*, lammergeier *Gypaetus barbatus*, Eurasian black vulture *Aegypius monachus*, imperial eagle *Aquila heliaca* (VU),

golden eagle *Aquila chrysaetus*, whitetailed eagle *Haliaeetus albicilla*, peregrine *Falco peregrinus* and lesser kestrel *Falco naumanni* (VU). The fauna on Mount Galichica is diverse, with some 170 vertebrate species: 40 mammals, 124 recorded birds, 10 amphibians and 18 reptiles. The avifauna of neighboring Lake Prespa is said to number more than 160 breeding birds with another hundred passing through, and twenty-three raptors are known in its Erezani ornithological reserve.

## **CONSERVATION VALUE**

Lake Ohrid is a natural museum possessing endemic primeval flora and fauna which are extinct elsewhere. The landscape of mountain and lakes, the town and the area's many old churches are beautiful and possess a world famous collection of more than 800 Byzantine-style icons dating from the 11th to the end of the 14th century. The adjacent wooded and heath-capped mountain of Galichica has a rich endemic and relict flora. The lake lies within a WWF Global 200 Freshwater Eco-region.

## **CULTURAL HERITAGE**

Neolithic settlements have been found on the lake shores and a town known as Lychnidos existed on the site in classical and Hellenistic Greek times. It was peopled by ancestral Phrygians and Illyrians before subjugation by Macedonians and then by Rome. It was important as a major crossroads on the Roman Via Egnatia from the Adriatic to Constantinople. From early Byzantine times and under domination by Slav tribes Ohrid was for some eight centuries a major Christian centre. The Cyrillic alphabet was developed there. It had a university in the 9<sup>th</sup> century, the oldest Slav monastery (St. Pantelejmon) and many churches which continued to flourish under the Ottomans. There are still at least 30 churches in the Ohrid area alone, several of them specifically listed in the World Heritage area. They are decorated with more than 800 icons painted between the 11th and the late 14th century in a distinct style which forms an artistic bridge between Byzantine and Italian art. It has also the most important collection of icons in the world outside Moscow.

## **LOCAL HUMAN POPULATION**

Nearly 200,000 people live in the three countries around Lake Ohrid, 106,000 of them in Macedonia, 61,000 in Albania where the main town is Podgorec in the south, and 25,600 in Greece. 50,000 live in the town of Ohrid and its surroundings where light industry, fishing and tourism are important. Ten species of fish are commercially fished, especially the two endemic relic species Ohrid trout and belvica; also the European eel.

## **VISITORS AND VISITOR FACILITIES**

The area is known as the Macedonian Lakeland and has been a most popular tourist attraction for many years. Visitor numbers are not known but are high during the summer, when they increase the population markedly. However, the political instability has recently discouraged tourism. Ohrid town and other shoreline settlements have very ample accommodation in hotels, houses and camps. On the mountain a visitors' centre is to be built at Konita, and an educational/recreational trail and mountain biking trail have been built on the upland ridge.

## **SCIENTIFIC RESEARCH AND FACILITIES**

There have been many studies of the area's cultural relics from the Iron Age through to late Byzantine buildings and icons. The lake has also been well studied for over 100 years and hundreds of studies published. Continuous systematic study of the lake and its water began in 1922 and was taken on by the Ohrid Hydrobiological Institute, founded in 1934, which concentrated on Ohrid trout production. In 1972 it cooperated in a limnological study supported by the Smithsonian Institution, Washington. It is now the Macedonian centre for monitoring pollution. A similar Hydrometeorological Institute with a capacity-building program for scientists has been set up in Podgradec for the Albanian part of the lake.

## **MANAGEMENT**

The specifically listed inscribed cultural monuments in and around the town of Ohrid are well preserved. However, an enormous amount of development has compromised the environment and the quality of the lake's littoral and water since nomination of the site 25 years ago, despite a law first passed in 1978 for the protection of the three largest Macedonian lakes. Improving conservation of the lake has therefore become of great importance. A UNESCO-ICOMOS-IUCN monitoring mission report in 1998 recommended a special legal framework for the World Heritage site integrating culture and nature, the strengthening of management, the preparation of a spatial plan for the area and the towns, and the extension of the site to include the whole of the adjoining Mount Galichica National Park. In 1996, with WB/GEF funding, the Lake Ohrid Management Board was set up to coordinate the laws and regulations of both Albania and Macedonia necessary to protect the lake. Then in 1999 the

Albanian government proclaimed its side of the lake to be Protected Aquatic and Soil Scenery, established Prespa National Park for the rehabilitation and protection of critical ecosystems of the Prespa Lakes area and in December 2002, established 14 Nature Monuments in the District of Pogradec. In 2000, Prespa Park, shared between all three countries, became the first transboundary protected area in southeastern Europe (Avramoski *et al.*, 2003). In 2003 Albania adopted a new law on environmental impact assessment.

Between 1998 and 2003 the Lake Ohrid Conservation Project (LOCP) promoted the legal framework for comprehensive transboundary cooperation over the lake's watershed, aiming for stronger enforcement of anti-pollution laws, bi-national monitoring and research, a watershed management plan, and greater public awareness. A draft Joint Agreement for the Protection and Sustainable Development of Lake Ohrid and Its Watershed in 2000 proposed an International Management Agency for the lake. An alliance for cooperation in Lakes Ohrid and Prespa produced a report in 2003, emphasising environmental education, stakeholder involvement and capacity-building for managing officials and scientists in both countries. A pilot project to establish a transboundary conservation network has recently been launched to improve cooperation between managers and scientists (Petkovski & Siderovska, 2003). The Joint Watershed Committee of the LOCP has developed a Strategic Transboundary Watershed Action Plan endorsed by the Lake Ohrid Management Board in 2003, involving all three countries within the watershed. This Action Plan outlines some of the actions needed and the roles of the stakeholders at both the national and local levels. Progress towards eventual control is slow but here have been successes and support from the public and NGO activity is growing.

## **MANAGEMENT CONSTRAINTS**

In recent decades pollution has aged the lake by thousands of years, and eutrophication is increasing. Political tensions within and between the neighbouring states and between state and local jurisdictions however, have complicated cooperation over the lake's treatment. Since 1978 there have been laws, revised in 1993, regulating construction on parkland and prohibiting the introduction of exotic species. In practice, there has been an attempt at sustainable management of the Park only since 1998. The UNESCO-ICOMOS-IUCN monitoring mission of that year concluded that the economic zone of the Park is still used for purposes such as residential and industrial shoreline developments and illegal dumping. The size of the fish catch and the quality of the water are threatened by over-fishing, much of it illegal, by bacterial and heavy metal pollution from mining and shoreline developments, by phosphorus from farmland pesticides and grazing cattle, and by the sediment both from sand-mining in the diverted river Sateska and erosion caused by hillside logging and clearing lakeside reed beds. Less than 25% of the catchment's waste water is treated. In the lake, pollution damages fish nursery areas and several introduced fish such as carp and rainbow trout now compete with the endemic fauna, diminishing the original stock.

In spite of conservation projects, cleansing of the lake is slow and eutrophication is advancing, especially by over-fertilisation by phosphorus. If this is not reduced by much improved controls over land uses in both countries, the pollution may become disastrous within a few years (MUPCE, 1998). Management of the area is complicated by bordering Albania where development controls over a third of the lake's shores, have been much weaker, and pollution control makes slow progress. Its lakeshore contributes heavy inputs of phosphorus, metal contaminants and raw sewage. In addition, local people consider that financial returns to the area from its resources should be increased. Inadequate management of the resultant tourism, the improper location of tourist accommodation and weekend cottages, and insensitive urban planning are degrading the coastal environment all round the lake. Better controls and enhanced public environmental awareness are needed (Avramoski *et al.*, 2003).

## **STAFF**

No information is available.

## **BUDGET**

The Lake Ohrid Conservation Project for the joint management of the lake by Macedonia and Albania was granted US\$4 million in 1996 (US\$1.84 to Albania and US\$2.26 to Macedonia) by the World Bank through GEF for the period 1998-2003. US\$30,000 has been granted to the Park to initiate trail planning. The German and Swiss governments also funded aspects of the work.

## LOCAL ADDRESS

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## DATE

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