

## **Lake Koronia and Lake Volvi: A Cry for Help!**

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**Rich in biodiversity and natural beauty, the Lakes of Koronia and Volvi in Northern Greece are under great threat from man. Themis Nasopoulou, holder of a Masters of Science degree in Biological Diversity and a registered guide in Greece's National Parks and Recreation Areas, wrote this exclusive report for BHM.**

Few people realize that the wetland of the lakes of Koronia and Volvi in Northern Greece represent a unique landscape of rare natural beauty with an extraordinary array of wetlands and ecosystems. The area's tremendous ecological importance has been recognized worldwide: both lakes are protected by the international Ramsar Convention, and have been designated as Special Areas of Conservation for wild fauna and flora by the EU.

The variety of seasonal swamps, streams, forests, aquatic thickets, reeds and freshwater marshlands have created a mosaic of incomparable beauty and amazing variety that every nature lover would fall in love with. This complex variety of ecosystems with the beauty of flamingos, pelicans, grebes, herons and a remarkable diversity of animals, plants and birds is captivating, yet sadly under-appreciated and endangered.

### **Unparalleled biodiversity in the region**

The region boasts astounding biodiversity of both species and habitats: There are 800 different plant species in different habitats surrounding the wetland. These include 340 different aquatic plant species, 13 of which are considered rare, as well as 248 bird species, 14 reptile species, 34 kinds of mammals, five amphibian species and 22 species of fish. Some species are indigenous to the region, and many are protected by international conventions. Sadly, some species such as the otter *Lutra lutra* seem to have become extinct.

The lakes are a hot spot for migrating birds, as well as an ideal wintering station and breeding haven for many birds and eagles overall. From the white stork and long-legged buzzard to the rare Egyptian vulture and Dalmatian pelican, the area is prized by serious birdwatchers and environmentalists.

### **Disaster, more manmade than natural**

The natural beauty of these lakes and their ecosystem, however, is in great danger due to human impact.



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Lake Koronia

Pollution caused by industrial and domestic sewage, combined with the overuse of water for farmland irrigation and the drought in the 1990s, caused the Koronia lake to dry up, killing all the fish. Rainfall was never enough to replenish the lake to the levels of its former glory.

There was a time when Lake Koronia's surface area was 46 km<sup>2</sup> in 1970, and its depth reached eight meters. Alarmingly, this declined to 38 km<sup>2</sup> in 1995, then to 11 km<sup>2</sup> in 2001, and was completely drained again in summer 2002. The lake only returned to the levels of 1995 in 2003 due to increased rainfall.

Nonetheless, during the last 10 years, the volume of Lake Koronia has been decreasing dramatically due to less rain and to overuse of water, which brought on serious ecological damage. As a result, the low water level of Koronia severed the natural connection between the two lakes. Although this had been artificially restored by a channel constructed in 1980, Koronia is still a very shallow lake today, with a depth between 0.5 and 1 meter, while Volvi varies between a depth of 10 to 24 meters.

In September 2004, the second massive wildlife disaster in Koronia Lake occurred: More than 30,000 birds were killed, and 39 species were severely affected, including some rare ones such as the Dalmatian pelican. This was due to harmful algae and other toxins such as *Clostridium botulinum*, which killed a massive number of birds. So far, investigations have not revealed the full reason of this disaster, but the presence of manmade pollution is certainly to blame to a large extent.

Studies show that uncontrolled water extraction in Lake Koronia will have an even more harmful impact on the aquatic ecosystem in the future. The lake does not support fish-eating water birds anymore, apart from a small number of great crested grebes. Although Lake Volvi still supports several fish-eating species of birds, the decrease in water levels poses a major threat for both lakes. Unauthorized pumping of waters for irrigation, farming activity and extended drought periods are to blame.

### **The impact of industry and farming**

There are around 33,000 people living in the region. About 6000 of them live in the major town of Lagadas, whose region has been thriving since the 1970s on industries such as textile dyeing units, tanneries, metal works, and dairy factories. The textile dyeing units consume the most water and release very high concentrations of salt. Lagadas, which has seen new industrial development in the region, actually pours its sewage into Koronia.

In addition, there are large areas of farmland producing around 140,000 tons of crop, from tobacco to clover, that require enormous amounts of water for irrigation, depleting the water levels of the lakes and nearby marshlands. Stockbreeding, with 300,000 poultry animals and 35,000 other domesticated animals, has also led to massive overgrazing, which has been pinpointed as one of the area's most serious problems.

### **Hunting**

While hunting in the area is officially prohibited, there are over 300,000 hunters in Greece, many of whom are unlicensed. There is evidence of heavy shooting in wetlands, even during statutory bans, including the use of illegal repeating shotguns. This, combined with easy access to wetlands through the use of off-road vehicles, has been a cause of major concern for environmentlists.

### **Murky waters**

Water quality in Lake Koronia is gradually being degraded by the development of manufacturing units in the area and the lack of sewage treatment. Agricultural waste, as well as sewage from the numerous animal breeding farms and industrial units of the area is detrimentally high, most of which ends up in Lake Koronia. Studies have shown that 14 plant species have disappeared from Lake Koronia, and two more have been lost from Lake Volvi.

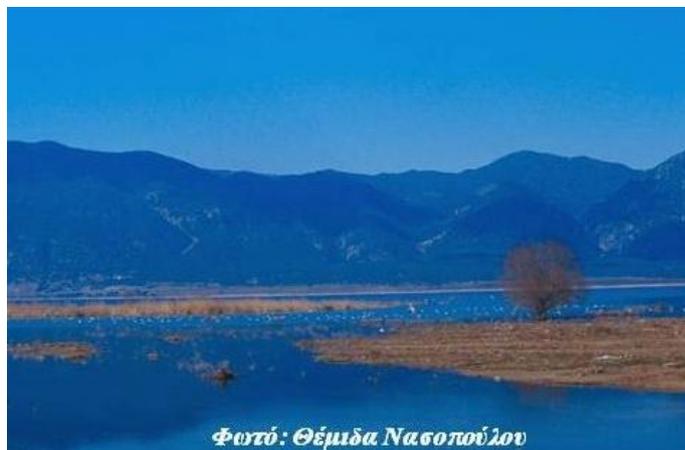
### **More help needed**

There have been some limited efforts to remedy the catastrophic impact by man on the lakes, but without too much progress. A Preliminary Management Scheme has been operating since 1997 on the site. Hunting is prohibited in the lakes and up to 200 meters from their shores. Also, a number of laws define the fishing regime and protect vegetation, while the Ramsar Management Guidance Procedure has been implemented for the site.

While there are various European initiatives to regulate agriculture, progress is slow. Studies reveal a need to reduce the use of fungicides and insecticides significantly, considered the most harmful agrochemicals in general. New farming methods, advocated by the EU, may also help.

Other than a group of representatives from local communities, there is no single body legally responsible for the direct local conservation of the wetland. The government needs to raise awareness among local residents regarding the value of the wetlands, responsible farming, reduction of pollution and much more.

But there is hope from nature, if the government and relevant bodies act fast. After 2003, rainfall increased and the lake was regenerated. High numbers of water birds reappeared in the winters of 2004 and 2005. The fact that during the last years a constant presence of flamingos, pelicans, grebes and herons was recorded in Lake Koronia is important from an ecological standpoint. Lake Volvi has not been affected as much by pollution and drought, primarily because the area surrounding the lake is less densely inhabited. There are no industries or factories so far, and much less farmland irrigation. However, fish populations have been gradually declining, and the number of species has dramatically declined in Lake Volvi since 1996. The reasons leading to these changes remain unclear, and more effort from all those concerned is needed. If the government, environmentalists and non-profit organizations do come to the rescue, there might still be hope for one of the most beautiful and biologically diverse areas of Southern Europe.



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**Lake Volvi**