

## The Status and Distribution of Freshwater Biodiversity in Northern Africa



Sahara Aphantius. *Aphanius saourensis*. Critically Endangered. © Heiko Kaerst

The northern Africa Freshwater Biodiversity Assessment is a conservation status review of 877 northern African freshwater species belonging to five taxonomic groups – fish (128 taxa), molluscs (155 taxa), dragonflies and damselflies (odonata) (82 taxa), freshwater crabs (3 taxa) and aquatic plants (509 taxa). This work addresses the lack of readily available information on the status and distribution of inland water taxa as a basis for adequate representation of freshwater biodiversity within current and future decision-making on the management and conservation of the region's wetlands. This IUCN Red List publication provides the first overview of the conservation status of these species in the region in accordance with the IUCN regional Red List guidelines. Species at risk of regional extinction are mapped and conservation measures are proposed to reduce the probability of future declines.

## Summary of Key Findings

### Results

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- 28.2% of the 877 northern African freshwater taxa assessed are threatened with extinction at the regional scale, with a further 9.5% assessed as Near Threatened and 14.1% as Data Deficient.
- 18 freshwater taxa, previously present within the region, are Extinct at the global level, including one endemic fish, *Salmo pallaryi*, and 17 molluscs, the majority of which are native to the Palearctic northern African region (Maghreb). A further 32 species are Regionally Extinct, which means that they have disappeared from the region, but still exist in other parts of the world: 23 freshwater fish, 2 molluscs, 6 dragonflies and damselflies and 1 aquatic plant.
- Freshwater molluscs and aquatic plants both show a high degree of regional endemism, with 81.5% of species endemic to the region.
- Due to the limited number of river systems and wetland areas within the region, freshwater species are mainly concentrated in the Mediterranean Maghreb and the Nile River in Egypt, where the highest numbers of threatened species are also found.
- Habitat loss and degradation, mainly due to water abstraction and dam construction, together with pollution, are the major causes of species decline.

### Key messages

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- A major priority for the region is to reduce the currently high number of species assessed as “Data Deficient” due to insufficient information on their current status and distributions. This requires new initiatives to conduct field surveys in the least known areas. This current lack of information on so many species represents a significant bottleneck in progress towards the effective management and conservation of the regions wetland biodiversity.
- The priority areas identified as centres of freshwater biodiversity and threat can help focus development and conservation actions in ways which aim to minimise impacts to freshwater species throughout the region.
- The involvement of communities with a stake in the long-term future of freshwater species and habitats across the region is critical to the success of conservation planning in order to assure the future sustainability of livelihoods, as well as the resources and services provided by functioning wetland ecosystems.

## Major Threats

All taxonomic groups were evaluated by specialist groups, who took into consideration the past, ongoing and future impacts leading to species extinctions and agreed on the main causes of decline for freshwater dependant species at the regional level.

At the northern African scale, habitat loss and degradation induced by human activities appeared to be the most important threat, together with pollution. In addition, natural disasters (especially drought and strong high flow events) are known to be severely affecting freshwater species and have a direct effect on populations. These threats are expected to worsen in the future due to the increasing effects of climate change. Other threats of relevance are human disturbance, changes in the native species dynamics, harvesting, invasive alien species and intrinsic factors.

In total, 207 threatened freshwater taxa are at risk of extinction due to **habitat loss and degradation** in northern Africa - 114 plants, 49 molluscs, 32 fish and 12 odonata. Threatened odonata, such as the Maghrebian endemic *Calopteryx exul*, are highly endangered due to the alteration of river systems through pollution and dessication of rivers as a result of water over extraction for agricultural and domestic use throughout northern Africa.

**Pollution** was identified as the second most important cause of freshwater species extinction in the region. In total, more than half of the regionally threatened freshwater fauna and flora assessed. This alteration of freshwater quality is a negative result directly related to uncontrolled waste disposal from agricultural, industrial and domestic human activities that, in the majority of the cases, are also linked to soil pollution.

**Droughts** are becoming more frequent and their severity and extent are increasing in the region, already the most affected by water scarcity of the entire African continent (UNEP 2006). On the other hand, important flooding episodes are also becoming more common in the region, carrying enormous amounts of sediment and destroy in the aquatic habitats.

## Conclusions and Recommendations

Freshwater habitats are under great pressure in northern Africa, due to the increasing water demands for agriculture, industrial development and drinking. This is clearly reflected in the high proportion of freshwater species under threat.

Furthermore, northern African freshwater biodiversity displays a high concentration of distinctive species, especially of molluscs and aquatic plants, which cannot be found in any other place of the world. However, this valuable natural patrimony is at high risk, as one fifth (21%) of its freshwater species is facing serious risks of extinction highlighting the responsibility of northern African countries to develop and implement conservation actions for these irreplaceable species.

### **Integrated River Basin Management (IRBM) and environmental flows**

River basins are closed systems where biotic and abiotic parts are interrelated and interact. Thus, activities directly related to human development, such as water and gravel extraction or pollution have direct consequences on the quality of the fauna and flora of the freshwater bodies. It is therefore essential to consider the ecological requirements of the freshwater species when planning and managing the hydrological resources ensuring by this the maintenance of goods and services that those ecosystems provide.

### **Sustainable agricultural techniques and waste/sewage management**

Reducing water pollution relies mainly in diminishing the use of fertilisers and pesticides in agriculture, which are currently used at very high levels in northern Africa harming its fauna and flora. This problem is only resolved when linked to a change in the legislation applied to these practices. In addition, future initiatives should be taken to increase the waste water treatment facilities available and to ensure that their capacity and action are adapted to the needs.

In relation to water overexploitation, more efficient irrigation techniques such as the use of drip instead of sprinklers, and practices such as night irrigation as an alternative to reduce evaporation are recommended to prevent depletion and continuous reduction of the water table resources.

### **Enforce legislation**

Enforcement of the current legislation is urgent, in particular preventing over harvesting of fish stocks by avoiding the use of illegal fishing techniques and ensuring the compliance with the current closed season obligations. In addition, legislation to protect threatened freshwater species (such as dragonflies or molluscs) and their critical habitats must be reinforced to prevent these highly threatened species to disappear, causing major losses of fundamental ecosystem services, like water purification.

### **Habitat and species conservation**

Key Biodiversity Areas, i.e., areas with a high number of threatened and endemic species (Langhammer *et al.* 2007). should be identified and protected and management plans should be developed and implemented, in order to prevent the decline in species under high threat of extinction and in habitat quality. These actions will help in habitat restoration as wetlands react relatively well and quickly to conservation actions.

### **Raising awareness through biodiversity information**

Effective educational programmes with special focus on children need to be implemented in order to raise awareness about the importance of freshwater species, their habitats' conservation and the threats increasingly faced by this biome. Moreover, educational projects oriented to all the population levels about the value of water and the need of more efficient techniques for the utilization of this resource are needed. Due to the rapid development of the region, it is fundamental to provide politicians, legislators and other relevant stakeholders with key biodiversity information about the status of freshwater ecosystems and the importance of

its integration in short and long term decision-making and planning.

**Data deficiency and research**

Research efforts focusing on species for which there is currently little knowledge must be dramatically increased. A Data Deficient listing does not mean that these 124 species are not threatened. In fact, as knowledge improves, such species are often found to be amongst the most threatened (or suspected as such from available evidence). It is therefore essential to direct research efforts and funding towards these species as well as those in threatened.