



# THE STATUS AND DISTRIBUTION OF DRAGONFLIES OF THE MEDITERRANEAN BASIN

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MEDITERRANEAN



The IUCN Red List of Threatened Species™ - Regional Assessment





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Published by: IUCN, Gland, Switzerland and Malaga, Spain.

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# Acknowledgements

Assessing species for the IUCN Red List of Threatened Species relies on the willingness of scientists to contribute and pool their collective knowledge in order to produce the most reliable estimates regarding the status of species. Without their enthusiastic commitment to species conservation, this kind of regional overview would not be possible.

The coordination of the Mediterranean Red Lists is



## Conclusions

### Threatened dragonflies in the Mediterranean

While some species are already receiving some conservation attention thanks to international laws (e.g. the European Habitat Directive), others are not. The priorities identified in this study include addressing the threats, such as the destruction and degradation of freshwater habitats, and the need to improve monitoring, surveys and studies in some important areas of the Mediterranean Basin.

This report shows where the highest diversity, the highest level of endemism, and the highest

portion of threatened dragonflies are found within the Mediterranean region. Based on this, five areas of high conservation concern were selected (Maghreb, The Levant, Crete, Southern Balkans and Western Mediterranean). These areas are discussed separately, and for each one, conservation actions are prioritized.

### needed for all Mediterranean countries

To ensure that Mediterranean species are secure in the long term, this needs to be combined with the political will to integrate biodiversity conservation into all policy sectors.

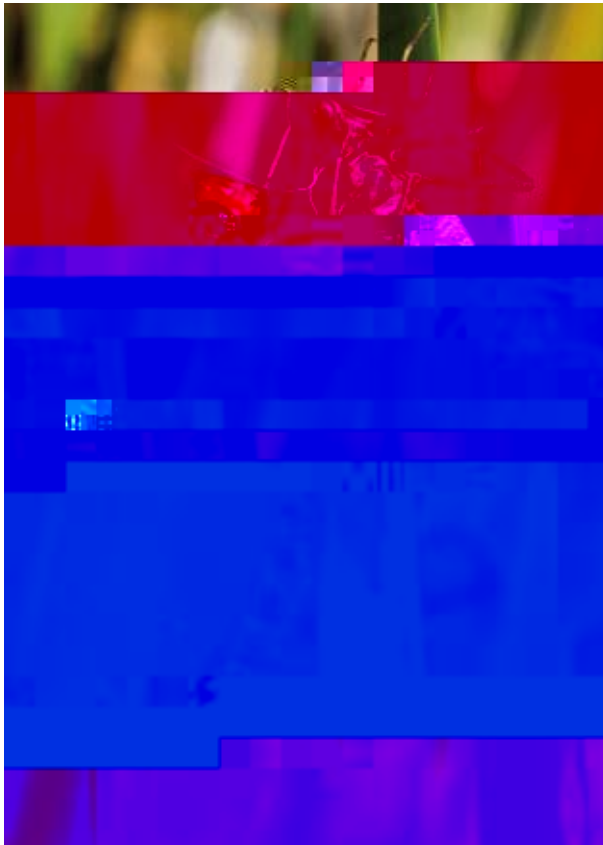
The moorland hawker ( ) copulating (Least Concern). This is a widespread species, present in central and northern areas of Europe. In the Mediterranean area its range is restricted to higher altitudes and mountain areas. It is associated to all kinds of standing water at higher altitudes and latitudes. At present no threats are known for this species, but in the future global warming might represent a major threat, possibly leading to the loss of species at the limit of its range area (e.g., Portugal). Conservation of breeding habitats is required, especially in isolated areas of its range. Photo: © Jean-Pierre Boudot.





namely Zygoptera or damselfies, and Anisoptera or true dragonflies. In this report the word 'dragonflies' is used for both suborders.

Blue emperor ( ) emerging. Odonata larvae live in water for even some years, and for this is needed to protect water bodies. Underwater, the larva changes skin a lot of time during its life, growing up. When the growing period is finished, the larva goes out from the water and moults for the last time. During emergence the individual changes completely shape of the body, wings and the abdomen expands, and after the time needed to become sufficiently hard, fly away as an adult individual. Photo: © Elisa Riservato.



Dragonfly larvae prey on all kinds of small animals up to the size of tadpoles and small fish. Larvae take from a few weeks to several years to develop. Emergence takes place above the water on plants or on the shore, after which most species leave the water edge to mature. Males return to the water to search for females or to establish territories, and females often only return to mate and to lay their eggs.

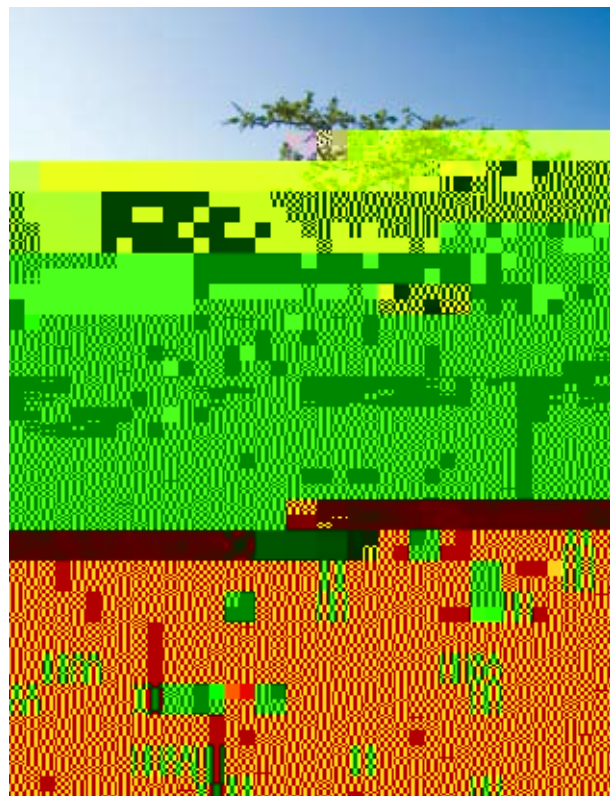
With 5,680 species, dragonflies are a relatively small order of insects (Kalkman 2008), and most of these species are found in the tropics. In the Mediterranean area (see Figure 2 for definition), 165 species are found, of which, 61 belong to the Zygoptera suborder and 104 to the Anisoptera suborder. In total 11 families are found in the region. The largest dragonfly families in the region

are the Libellulidae (48 species), the Coenagrionidae (35 species), the Gomphidae (21 species) and the Aeshnidae (16 species). Almost one in seven of the dragonfly species found in the Mediterranean Basin is endemic to the region, but endemism is especially common among the Calopterygidae, Platycnemididae, Cordulegastridae and Coenagrionidae families (see Table 1 next page).

## 1.2 The Mediterranean

The Mediterranean Basin, stretching west to east from Portugal to the Levant, and north to south from northern Italy to the northern coast of Africa, is one of the world's richest places in terms of animal and plant diversity, and has a high level of endemism (Myers 2000).

With almost 5,000 islands and islets, the Mediterranean comprises one of the largest groups of islands in the world. There are some 4,000 islands of less than 10 km<sup>2</sup> in the Mediterranean, and 162 with a surface area of 10 km<sup>2</sup> or more. The nine Mediterranean islands of over 1,000 km<sup>2</sup> account for 83% of the total island area. These islands are of high value to global biodiversity due to their wealth of species and relatively high levels of endemism.



**Table 1. Diversity and endemism of the dragonfly families of dragonflies in the Mediterranean Basin.**



The region is characterized by its climate, where cool and wet winters alternate with long, hot, dry summers. Sometimes, for example in Libya and Egypt, annual rainfall is extremely low, but on the other hand, other countries are well-watered thanks to a high rainfall (including Algeria and part of the Balkans).

The countries bordering the Mediterranean have a total population of around 455 million people (Blue Plan 2008). The area has experienced intense human development and impact on its ecosystems for thousands of years, and various forms of human settlements have existed there for at least 8,000 years.

For many countries, water resources are a key issue, and in the southern Mediterranean countries, it is estimated that, Egypt, Israel, Libya, Malta, Syria and the Gaza Strip, for example, are using more than their renewable water resources (e.g. fossil water). About 64% of Mediterranean freshwater is used for agriculture (Blue Plan 2008).

In semi-arid areas, many years of unsustainable farming techniques have led to erosion, salinization and land degradation, and combined with the low rainfall, this has led to moderate risk of desertification that many areas in the Mediterranean are currently facing (Blue

Plan 2008). Whereas previously, exploitation of the natural landscape was long, slow and relatively sustainable, in recent decades, the traditional balance between nature and humankind has been lost. The development of tourism has placed significant pressure on the region, mainly on the coastal ecosystems. The shores of the Mediterranean Sea are the biggest large-scale tourist attraction in the world, and 246 million people – 31% of all international tourists – visited the countries of the region in 2005 (Blue Plan 2008).

The construction of infrastructures and the direct human impact remains a key threat to coastal areas in Turkey, Cyprus, Tunisia, Morocco and Greece, as well as on the smaller Mediterranean islands.

Human demography and encroachment, the intensification of agriculture, fires, over-grazing, tourism and climate change are some of the major threats to Mediterranean habitats. Habitat fragmentation is also a serious problem and the original flora and fauna often is left in small, scattered patches.

Today, a mere five percent of the original extent of the hotspot contains vegetation that is relatively intact, placing the Mediterranean Basin amongst the four most significantly altered hotspots on the planet (Myers et al. 2000).

### 1.3 Mediterranean wetlands

For thousands of years, the wetlands around the Mediterranean Basin have provided essential services to local humans – water, food, materials, and transport – and have acted as a backdrop to their social and cultural activities. But in recent times, and especially during the first part of the twentieth century, Mediterranean wetlands have been destroyed or degraded in order to prevent water-borne diseases, to make room for the construction of housing and industry due to regularly increasing human populations, and to favour the development of tourism. Many have been systematically converted into agricultural landscapes to increase the local production. This has resulted in an estimated half of all Mediterranean wetlands being lost (EEA 2008), and of those that still remain, the major ecosystems are degraded, and nearly all important rivers in the Mediterranean Basin have been dammed (Smith and Darwall 2006).

The most widespread threats to freshwater habitats are drainage for agriculture and drinking water, settlements, urbanization and pollution. Mechanisms such as embanking a river, the over-exploitation of groundwater resources, or building dams, are just some of the many reasons why wetlands are deteriorating.

Wetlands are crucial for dragonflies, as they need the presence of water during both their terrestrial and aquatic

phase. Water is the prime habitat for larvae, which can take years to develop and grow, and following this, adults will later need water for reproducing and often for food resources.

### 1.4 The IUCN Red List of Threatened Species

The conservation status of plants and animals is one of the most widely used indicators for assessing the condition and biodiversity of an ecosystem. It also provides an important tool in establishing plans for priorities to conserve species. The IUCN Red List Categories and Criteria are the world's most widely used system for gauging the extinction risk faced by species. This system is based on nine Categories (Figure 1), ranging from Least Concern, for species that are not threatened, to the Extinct category, for species that have disappeared from the planet (IUCN 2001).

These Categories are based on a set of quantitative criteria linked to population trends, population size and structure, and geographic range. Species classified as Vulnerable, Endangered and Critically Endangered are considered as 'threatened'. When conducting regional or national assessments, two additional categories are used (Regionally Extinct and Not Applicable) for non-native species (IUCN 2004).

Lake Tonga in Algeria. Photo: © Boudjéma Samraoui.

IUCN has already assessed the conservation status of 629 (11%) of the world's dragonflies species (IUCN 2008). Globally, 22% of the assessed dragonfly species are included in one of the threatened categories, and two species are Extinct (*Megalagrion jugorum* and ). However, IUCN is still in the early stages of assessing all 5,680 of the known dragonfly species. The assessment of all species in the Mediterranean region is a contribution to the overall aim of assessing the status of all dragonflies in the world.

## 1.5 Assessment objectives

This dragonfly assessment in the Mediterranean Basin has four main objectives:

To give an overview of the dragonfly fauna in the Mediterranean Basin, to assess the conservation status of the dragonfly species in the Mediterranean Basin, to identify the distribution of dragonfly species in the Mediterranean Basin, and to identify the distribution of dragonfly species in the Mediterranean Basin.

## **Basin for the assessment**

The Mediterranean region, in terms of freshwater systems, was defined by identifying all catchments of rivers flowing into the Mediterranean Sea and the adjacent

Group of the IUCN Species Survival Commission (SSC). Preliminary conservation status assessments were conducted for all species using existing literature and data sources, in addition to personal knowledge. The data collected, including information on distribution, conservation measures, threats, habitats and ecology, was then entered into an MS-Access database via the IUCN Species Information Service Data Entry Module (SIS DEM).

Red List training workshop in Rabat (Morocco, February 2007). Photo: © Annabelle Cuttelod.



## 2.4 Review Workshop

The Mediterranean members of the Dragonfy Specialist Group were invited to attend a five-day regional review workshop at CIBIO in Porto (Portugal) in October 2007. All participants received the preliminary assessments (SIS DEM species summary reports) before the workshop and were asked to check the data and ensure

Dragonfies review workshop in Porto (Portugal, October 2007). Photo: © Annabelle Cuttelod.



that they included the most up-to-date, comprehensive and rigorous information.

A workshop session was dedicated to discussing the most appropriate conservation measures, in order to reduce the impact of the dragonfy's main threats which were identified during the Red Listing process.

## 2.5 Post-workshop editing

Following the review workshop, the data was edited, and consistency in the use of IUCN Criteria was checked by the workshop participants and IUCN staff.

The resulting assessments, supported by relevant literature and references, provide the best available scientific consensus concerning the status of the species. Regular updates will be made when new information becomes available.

## 2.6 Database and distribution atlas of

During the workshop held in Porto in October 2007, the participants decided to start working on an atlas of the Mediterranean and North Africa, which was published in March 2009 as *Atlas of the Dragonflies of the Mediterranean and North Africa* of the journal *Journal of Insect Conservation* (Boudot *et al.* 2009).

This atlas combines several different databases covering a total of 35 countries (15 European). It shows the distribution of 179 species and some additional subspecies that are present in the Mediterranean countries in the area between 18°N and 47°N, from the Canary Islands to W Iran (Figure 3); an area that significantly exceeds the Mediterranean region defined in the present report.

This database was also used to create some of the maps presented here. The atlas itself gives important background information for conservation by showing the former and current distribution of all taxa.

The different databases will be maintained and expanded in the future. In the atlas, information can be found on the focal point of each of the different databases used; these are the people who should be contacted by those wanting to contribute to the databases or use them for analyses or conservation works. For those wanting information on the database in general, they should contact the Chair of the IUCN Dragonfy Specialist Group.





### 3.1 Conservation status

A list of the dragonfly species present in the Mediterranean Basin, along with their IUCN Red List status, is available in Appendix 1. Of the 165 Mediterranean dragonflies species, 19% are classed as threatened: 3% are Critically Endangered, 8% are Endangered, and 8% are Vulnerable (Table 2; Figure 4). A total of 58% are classified as Least Concern, while 16% are Near Threatened. Four species (2%), *and* are listed as Regionally Extinct. One species, *favescens*, has been assessed as Not Applicable, as it is a circumtropical obligate migrant which goes north with the monsoons and shows only a very marginal occurrence and incidental reproduction in the Mediterranean.

in the Coenagrionidae family, out of 35 species, six are threatened (17%), a further two are Regionally Extinct (6%) and six are Near Threatened (17%); in the Gomphidae family, six species out of 21 are threatened (29%); in the Cordulegastridae family, of the eight

Conservation status varies between dragonfly families and some appear to be more vulnerable than others. For example, in the Calopterygidae family, three species out of seven are classed as threatened (43%);

**Figure 4. Summary of the conservation status of all dragonflies in the Mediterranean.**

**dragonflies in the Mediterranean.**

Categories are abbreviated as: RE – Regionally Extinct; CR – Critically Endangered; EN – Endangered; VU – Vulnerable, NT - Near Threatened, LC - Least Concern, DD - Data Deficient and NA - Not Applicable.

Four species, all with a largely Afrotropical distribution, are Regionally Extinct in the Mediterranean.

, and have not been recorded since the beginning of the 1900s. These species were only known to be found in the Mediterranean in the now largely urbanized, cultivated and polluted Nile delta and Cairo area. The Afrotropical was first and last seen in Algeria in the mid-nineteenth century and disappeared from the Levant during the middle of the twentieth century due to the draining of the former Lake Hula in Israel.

In the Mediterranean Basin, 31 species (19% of the total) are threatened (either Critically Endangered, Endangered or Vulnerable). Ten of these are endemic to the region and their situation gives extra reason for concern (see chapter 3.2.2.). Of the 31 threatened species, 22 are others predominantly occur in still waters. All ten of the endemic threatened species are dependent on running waters. The threatened running water species are present throughout the region. The species that are dependant on standing waters, for the most part, fall into two groups: some of these are widespread Afrotropical species, which are rare in North Africa and threatened due to degradation of the freshwater marshes and lakes

Table 3. Odonata species extinct at the Mediterranean Basin level



by climate change, as their habitats, such as fens and bogs, are being threatened by desiccation. The decline of \_\_\_\_\_ is largely due to changes in the management of fishing waters and rice fields.

The banded darter ( ). This species is present across all the northern part of Italy to Slovenia, the south eastern part of France and the Southern Balkans. Some isolated populations are known from the northern part of Spain and the western part of France. It favours standing water, such as shallow pools with developed vegetation and slow-flowing waters, such as ditches and irrigation channels, with developed vegetation. Habitat destruction is the main threat to the species and potentially increased drought and drying out of habitats as a result of climate change is a future threat. Most species of this genus are easy targets for predatory fish species and can be impacted by aquaculture, but there are no specific data on the overall effects of this (Least Concern). Photo: © Fabio Pupin

*Pantala favegens* is the only species of dragonfly that has been judged as Not Applicable. This species has a circumtropical distribution and is an obligate migrant, going north with the monsoon fronts and scarcely reaching the Mediterranean, yet it has once been reported to reproduce successfully in the region (Arlt 1999).

### 3.2 Patterns of species richness

Information on the species richness of dragonflies is given in Section 1 and Table 1. The geographic distribution of dragonfly species richness in the Mediterranean Basin is presented in Figure 6.

On a global scale, the diversity of dragonflies can be largely explained by temperature and precipitation, with the highest diversity being found in the wet and hot tropics. In the Mediterranean, diversity largely coincides with precipitation patterns: areas with a relatively high rainfall, like the Alps and the mountains of the Balkans, Turkey, and the Maghreb, have a high diversity, whereas

in regions with little rainfall, and hence relatively little freshwater, especially the Saharan belt, fewer species are found. Higher diversity in mountainous areas is of course not only influenced by rainfall, but also by the fact that there is a greater diversity of habitats in these areas.

Paleoclimatic events have also influenced the diversity of dragonflies. Past glacial times have strongly decreased species richness in parts of Europe and Asia and only a relatively small number of species were able to colonize these areas during the Holocene.

Table 3 shows the species richness in dragonflies of the countries of the Mediterranean Basin. As expected, higher totals of species are found in the countries of the central area of the basin. Italy has the highest number of species due to its particular shape, allowing the presence of North African species in the south, and alpine species in the north.

A relatively high percentage (14%) of Mediterranean dragonflies is endemic to the region. The highest numbers of endemic species are found in the Maghreb and the

Figure 6. Species richness of dragonflies in the Mediterranean Basin

Figure 7. Species richness of endemic dragonflies in the Mediterranean Basin

Levant, whereas the lowest numbers corresponds to the southern Balkans, Crete and the Western Mediterranean (Figure 7).

present in the running waters of the lower reaches of the mountains.

(VU),  
(NT),  
and  
**Maghreb:**  
(EN),  
(DD),  
(LC). Most of them are

(VU),  
(EN),  
(NT),  
(LC) and

(VU),  
(EN),  
(LC),  
(LC). These

are mainly present in Lebanon, Israel, Jordan, the Palestinian Territories and the western parts of Syria. Many of them occur as far north as the Turkish Adana area (Ceyhan and Seyhan delta), while a few are present along the Turkish coast, mainly towards the west.

(EN), (EN) and (VU). These are mainly present in Greece. The last-mentioned species is confined to irregular and partly shaded rivers in the northeast of Greece, the southeast of Bulgaria and European Turkey. occurs in small brooks in the Peloponnese up to the northern side of Corinth Gulf, Euboea, and in some Cyclades Islands (under several subspecies), while ranges from the Peloponnese to Corfu and southern Albania.

*Boyeria cretensis* (VU) and (NT). Both are scattered over the island of Crete, where they are more or less confined to the upper course of some rivers which remain unaltered and shaded.

**Western Mediterranean endemic species:**

(NT), (LC), (LC) and (NT).

The Bulgarian Emerald ( ) is confined to a small number of brooks and small rivers in the southeast of Bulgaria, d shaded. ca++ #0105

Threatened dragonflies are found all over the Mediterranean region. There are however a few areas with high concentrations of threatened species (see Figure 8). The most notable are the Levant and southern Turkey, the southern Balkans, northeastern Algeria (Numidia) and the adjacent northern parts of Tunisia.

### 3.3 Major threats

Figure 9 shows a summary of the major threats to dragonflies in the Mediterranean region, as well as the number of threatened (31) and non-threatened (134) species.

Habitat loss and degradation caused by humans is the main threat for both threatened and non-threatened species, and is currently affecting 110 dragon fly species, including 30 of the 31 threatened species . Water pollution is also a

major concern as it is having an impact on 97 species, of which 30 of them are threatened. Natural disasters like, for example, the disappearance of breeding habitats due to drought, have the next biggest impact, affecting 75 species, of which 26 are being threatened.

Global warming is likely to exacerbate the impact and extent of several of these threats and is one of the biggest present and future threats to dragon flies. The alpine and Mediterranean species now confined to man-made sub-desert areas are the most sensitive to global change.



Figure 9. The present major threats to dragon flies in the Mediterranean Basin

Desiccation of aquatic habitats, as a result of climate change and over-irrigation, is likely to become the main threat for many threatened Mediterranean dragon flies. Stymfalia Lake, NE Peloponnese, Greece. Photo: © Jean-Pierre Boudot.



## **4.1 General**

Species frequently require a combination of conservation responses to ensure their continued survival. These responses include legislation, research, monitoring, population management, and land acquisition or control. Although time-limited or local actions are important for the conservation of dragonflies, they are unlikely to be strong enough or coherent enough to prevent the extinction of those species who are already threatened across their whole range. Therefore, long-term coordinated actions are required at regional, national and international level.

The protection of sites plays a crucial role in any effective conservation strategy. Several international treaties call for the selection and protection of sites on

Based on this, five areas with high conservation concern were selected. These areas are discussed below, and for each one the conservation actions are prioritized.

### **The Maghreb**

The Maghreb has a high level of endemism and the pressure on freshwater habitats is increasing, largely given the population increase [x 2.5 in Morocco, x 3.1 in Algeria and x 2.3 in Tunisia between 1961 and 2003] (FAOSTAT, 2004 – 2005).

A freshwater action plan for the Maghreb is highly desirable. This plan should include an overview of the protected areas which can be used to determine the main gaps in the protection of freshwater plants and animals.

A species action plan for the CR and relict species, , is urgently needed. This could be carried out under a management plan for Lac Bleu (northeast Algeria); an area which has several relict macroinvertebrates.

In Morocco and Tunisia, there is an advanced level of knowledge on dragon flies thanks to various important publications, but this should be urgently updated in Algeria as it could not be done during recent decades, except for in the northeast, due to the local political situation. However, with the exception of Algeria, there is no specialist present in the Maghreb, so at present there is no monitoring being carried out in Morocco and Tunisia. It is advisable that a capacity building workshop be organized in order to train students and involve local people working within the network of Mediterranean dragon flies. This could also be used to increase contact between people working on freshwater issues in Tunisia, Algeria and Morocco.

The Levant, including the southern part of Turkey, scores high in regards to levels of diversity, the presence of endemic species, and the presence of threatened species. The increasing demand for water, in combination with climate change, makes it likely that the conservation status of many species will deteriorate in the near future.

A freshwater action plan for the region is needed. Protection of the largest river systems is dependent

on the cooperation between the regional countries, and this is not easy given the local political situation. However, a freshwater action plan can be used to emphasize how important cooperation is and also outline possibilities. After a period of strong alteration in most local hydrosystems, some nature reserves have been created and may favour the monitoring of dragonflies if it is not already being done. The Lake Hula/Lake Agmon Nature Reserve in North Israel, and the Aammiq Wetland Nature Reserve in the Beqaa Valley in Lebanon, are fine examples of this. A freshwater action plan dealing with running waters would be an important complement to those addressing still waters, and it should include an assessment of the quality and conservation of the b124(Reserve 12(tT\*[(addresA3112(tT\*no4ssment )-211(and )-21sj

The dragonfly fauna in Crete is relatively low but features two endemic species:

and *Boyeria cretensis*. Both are threatened in the present context of global warming and rainfall deficit. They breed in shaded areas in the upper courses of some small Cretan rivers and are presently known from only 9 and 11 river

they are not the best indicators and are not involved in determining biotic indexes.

their distribution can be mapped with the aid of volunteers, so that much more information is available for this group than for any other.

they are generally popular and have a wide audience, and thus can be used as appreciated ambassadors for freshwater conservation, which is important for raising awareness among non-specialists.

In order to use dragonflies as a quality indicator, up-to-date information on distribution is needed. For specific projects, specialists can gather information, however, to obtain countrywide information it is far more cost-efficient to establish a network of volunteers. This is what has been established in France since the 1980's, tends to develop in parts of Spain, and will probably be developed in Portugal and Italy. Building and constructing a network of volunteers is time consuming, and work on this needs financial support.

The distribution data on Mediterranean dragonflies is being maintained in several national and regional databases. All these databases have been built by single volunteers or by NGOs. Information on the contact persons of these databases can be obtained from the first author of the present report or found in Boudot (2009). In most cases, the databases can be used for conservation projects and scientific research, but depending on the project, a financial contribution to the database management may or may not be required.

Dragonflies are suitable for monitoring the quality of freshwater habitats. Countrywide monitoring

based on work by volunteers is not yet possible in the Mediterranean, however small funded projects in order to monitor threatened endemic species are. This would be useful for species such as:

, ,

# 5. Conclusion

The Mediterranean area is an hotspot of biodiversity and endemism for dragonflies too. For some of the countries included in the area some dragonfly species already receive some conservation attention thanks to international laws (e.g. the European Habitat Directive) but others do not and are facing the risk of extinction. The results of this Report highlight that Threatened dragonflies in the Mediterranean Basin require urgent action to improve their status and priorities identified in this study include addressing threats such as destruction and degradation of freshwater habitats and the need of improving monitoring, surveys and studies in some important areas in the Mediterranean Basin. In this

report it is shown where the highest diversity, highest level of endemism and highest portion of threatened dragonflies is found within the Mediterranean region. Based on this, five areas, the Maghreb, The Levant, Crete island, Southern Balkans (mostly Greece) and Western Mediterranean, have been individuated where high conservation concern must be developed. To ensure that Mediterranean species are secure in the long term, this needs to be combined with the political will to truly integrate biodiversity conservation into all policy sectors. Sustained investment in species, site and landscape level conservation and monitoring is needed for all Mediterranean countries.

Dragonflies' species identification and data collection in the Teknepinar region, south of Turkey. Photo: ©Gilles Jacquemin.













# Appendix 2. Example of species summary and distribution map

## Urothemis edwardsii CR

Taxonomic Authority: (Selys, 1849)  
Global Assessment      Regional Assessment      Region: Mediterranean      Endemic to region

Synonyms      Common names  
Libellula edwardsii      Selys, 1849

### Upper Level Taxonomy

Kingdom: ANIMALIA      Phylum: ARTHROPODA  
Class: INSECTA      Order: ODONATA  
Family: LIBELLULIDAE

### Lower Level Taxonomy

Rank:      Infra- rank name:      Plant Hybrid  
Subpopulation:      Authority:

### General Information

Total Population Size

Minimum Population Size:

Maximum Population Size:

Threats

Conservation Measures

4.2 Restoration

4.3 Corridors

4.4 Protected areas

## IUCN Red Listing

Red List Assessment: (using 2001 IUCN system) Critically Endangered (CR)

Threat category adjusted from Global to Regional status: No Change in Category

Red List Criteria: A2ac; B1ab(ii,iii,iv,v)+2ab(ii,iii,iv,v); C1+2a(ii); D

Date Last Seen (only for EX, EW or Possibly EX species):

Is the species Possibly Extinct?      Possibly Extinct Candidate?



# Appendix 3. Summary of the IUCN's Red List Categories and Criteria Version 3.1

**Summary of the five criteria (A–E) used to evaluate if a taxon belongs in a threatened category (Critically Endangered, Endangered or Vulnerable).**



## **IUCN – The Species Survival Commission**

The Species Survival Commission (SSC) is the largest of IUCN's six volunteer commissions with a global membership of 8,000 experts. SSC advises IUCN and its members on the wide range of technical and scientific aspects of species conservation and is dedicated to securing a future for biodiversity. SSC has significant input into the international agreements dealing with biodiversity conservation.

[www.iucn.org/ssc](http://www.iucn.org/ssc)

## **IUCN – Species Programme**

The IUCN Species Programme supports the activities of the IUCN Species Survival Commission and individual Specialist Groups, as well as implementing global species conservation initiatives. It is an integral part of the IUCN Secretariat and is managed from IUCN's international headquarters in Gland, Switzerland. The species Programme includes a number of technical units covering Species Trade and Use, The IUCN Red List, Freshwater Biodiversity Assessment Initiative (all located in Cambridge, UK), and the Global Biodiversity Assessment Initiative (located in Washington DC, USA).

[www.iucn.org/species](http://www.iucn.org/species)

The IUCN Dragonfly Specialist Group focuses on the conservation of damselfies, dragonflies and their freshwater habitats. The DSG has a global volunteer network of over 50 expert members across the globe. Main focus of the work is the gathering and dissemination of information on distribution and threats of the nearly 6,000 damselfies and dragonflies. Currently the DSG is working on distribution databases and an assessment of the threat status of all damselfies and dragonflies. The Global Dragonfly Assessment will be an important tool in the conservation of freshwater habitats.

## **IUCN – Centre for Mediterranean Cooperation**

The Centre was opened in October 2001 and is located in the offices of the Parque Tecnológico de Andalucía, in Málaga. IUCN has over 179 members in the Mediterranean region, including 15 governments. Its mission is to influence, encourage and assist Mediterranean societies to conserve and use sustainably the natural resources of the region.

[www.iucn.org/mediterranean](http://www.iucn.org/mediterranean)

# IUCN Red List of Threatened Species™ – Regional Assessments

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