PRESS RELEASE

Doñana's situation in 2023: drought, high temperatures and clear species declines

- **The Doñana Biological Station – CSIC presents the report "State of the Biodiversity in Doñana" 2023 with the results of the Monitoring Program carried out by the ICTS-Doñana**
- **2023 has been a very dry and hot year, with the highest mean annual temperature on record. The low flooding of marshes and ponds has resulted in low numbers of waterfowls, amphibian and fish species.**

Santa Olalla pond, the last permanent pond in Doñana, completely dry in August last year. In front, one of the automatic infrastructures of the ICTS-Doñana for environmental monitoring // EBD-CSIC

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Seville, 1st February 2024. The Singular Technical Scientific Infrastructure - Doñana Biological Reserve (ICTS-Doñana), ascribed to the Doñana Biological Station - CSIC, has presented today the report "State of biodiversity in Doñana" 2023 with the results of the Natural Processes Monitoring Program carried out in the Doñana Natural Area. Within this program, scientific information is periodically collected on the conservation status of Doñana, which allows detecting the temporal evolution of ecosystems and biodiversity. The results are periodically transferred to the Doñana Natural Area Office and to the regional authorities.

Data indicate that 2023 was a very dry and warm year for Doñana, with the highest average annual temperature recorded in the historical series. In addition, low flooding of marshes and ponds has resulted in low numbers of wintering waterfowls and has contributed to the continuation of the decline of breeding waterfowl populations and other animals, especially amphibians and fish. The general situation is also bad for rabbits, main pray of many carnivores and raptors.

The Monitoring Program includes several areas ranging from monitoring of the physical environment and the state of Doñana's surface hydrology to an estimate of the conservation status of the main habitats and, of course, the monitoring of species and populations.

High temperatures and low rainfall

The last hydrometeorological cycle, which runs from September 2022 to August 2023, has been described as "very dry". Doñana has already been experiencing below-average precipitation levels for more than a decade, especially in the last two years. With only 330.4 mm recorded, this last cycle is the second with the lowest annual precipitation of the last decade after the cycle 2021-2022.

Regarding temperature data, Doñana is once again breaking its records. Last year it reached the maximum temperature recorded in the entire historical series, while this year the annual average temperature recorded is the highest on record, reaching 19.32ºC. The summer has been long and hot, with 14 days with temperatures above 40ºC.

High temperatures and low rainfall have seriously affected the Doñana's pond system, which is severely damaged by overexploitation of the aquifer. The Santa Olalla pond, the largest in Doñana, dried up completely in the end of August, one month earlier than last year. Since the ICTS-Doñana has records, this pond had never before dried up two summers in a row, not even during periods of extreme drought in the 1990s and early 2000s. Historically, Santa Olalla was a permanent pond, that means, it held water year-round and served as a refuge for many species during the warmer, drier season. However, this fact indicates that there are no permanent ponds in Doñana. The other two largest ponds in Doñana, Sopetón and Dulce, dried up in early July and early August, respectively.

Important decline of waterfowls

Waterbirds have been censused monthly in Doñana by aerial and ground counts since 1973. In January, the census is carried out simultaneously throughout Europe as part of the International Waterbird Census coordinated by Wetlands International. The number of individuals counted this month 2023 was 206,859, the tenth worst record for these dates in the entire historical series, which spans 60 years. These values are somewhat higher than in January 2022, but are largely explained by the rainfall during the month of December 2022, which caused the marsh to have a shallow water table and allowed the birds to settle in the area at that time. Even so, the number of birds counted is only a third of the wintering in a good year. The situation of the common goose *(Anser anser*), an emblematic species in Doñana, is especially serious. This year, it has registered the lowest number in its history with 9,588 specimens.

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In general, waterfowl breeding has been poor, since the area flooded in spring has been scarce and has been limited, for the most part, to artificially flooded areas or areas with tidal influence. 68% of species breeding in Doñana have a negative population trend in the last two decades. This value increases to 79% if the trend is calculated for the last ten years.

In the case of raptors, the wintering red kite (*Milvus milvus*) continues to show a significant decline and has presented a census of 120 individuals. The western marsh harrier (*Circus aeruginosus*) did not reproduce this year and its wintering population was only 213 individuals, the lowest value in the entire historical series. Another example is the peregrine falcon (*Falcon peregrinus*), whose population also presents a negative trend. This year only three pairs have been counted.

Rabbit populations continue to be scarce

Mammals also counts with specific monitoring actions. Rabbits continue to have very low abundances, compared to those recorded in Doñana in other years. The hare has shown a slight decrease, while the deer show an increasing trend and the wild boar remains stable.

Overall, 2023 has been a bad year for almost all carnivores in Doñana. The fox remains the most abundant carnivore, followed by badger and mongoose. The relative abundances of genet and lynx oscillate, while bobcats and otters are the least abundant species.

Amphibians and fish continues to have negative trends

In the case of fish, three native species, whose distribution in the Doñana Natural Area is very restricted, can be mentioned. First, the eel*(Anguilla anguilla*), which is in danger of extinction, has not appeared in any point sampled, not even in those where it was once abundant, such as La Rocina or Arroyo del Partido. The Spanish toothcarp *(Aphanius iberus*), an endangered Iberian endemism, could not be located this year in Doñana due to the low flooding of the Hondón lagoon. *Cobitis paludicola*, classified as 'vulnerable', has only appeared in the Laguna de los Mimbrales.

The situation of amphibians is also of concern. Almost all populations of amphibian species present in Doñana continue having a negative trend since 2019, in line with the drought period, which is affecting the spatial and temporal extent of their breeding habitats.

Also 2023 has been a year with one of the lowest numbers of butterflies per census. Low rainfall and high temperatures have possibly negatively affected this group.

Finally, in the data provided on plant species, it is important to highlight the negative trend of the endangered flora species *Caropsis verticillato-inundata,* associated with wet soils and temporary ponds, something to be expected considering the regression of this habitat and the prolonged drought.

The ICTS-Doñana

The ICTS Doñana is the largest field laboratory in Europe and a research tool for the scientific community. Among its functions are to support research in Doñana and serve to generate information that is crucial for good management and conservation of the protected area. It is a unique field to investigate the ecology, evolution and conservation of biological diversity and the impact of global change.

Given its priviledge geographical location, at a crossroads between Europe and Africa, Doñana is a passage, breeding and wintering site for more than 300 bird species. It has eight habitats of community interest, endemic plants and is also a refuge for endangered species such as the Iberian lynx, the red kite or the Spanish imperial eagle.

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Doñana also stands out for its high diversity of invertebrate species with more than 200 species of bees and some 1,000 species of nocturnal butterflies, as well as others that are endangered such as the wolf spider or the dung beetle.

Full report (Spanish)

Programa de Seguimiento de Procesos Naturales. Espacio Natural de Doñana. Memoria 2023. ICTS-Doñana. Estación Biológica de Doñana.
https://doi.org/10.20350/digitalCSIC/16104

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