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Spain's Doñana World Heritage Site in danger

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LETTERS

Water extractions for greenhouse agriculture have drained the aquifer under Doñana National Park in Spain.

Edited by Jennifer Sills

Spain's Doñana World Heritage Site in danger

Spain's Doñana National Park, established in 1969, was listed as a UN Educational, Scientific, and Cultural Organization (UNESCO) World Heritage Site in 1994 in recognition of its wide range of habitats, including seasonal ponds, lagoons, and marshlands, and its biodiversity (1). A diverse combination of European and African flora and fauna inhabit the park, including many endemic species (2). Doñana also supports several migratory waterbird populations (3), many of which are globally threatened and show long-lasting declines despite increasing international investments in their conservation (4, 5). However, human activities and environmentally questionable political decisions have put Doñana at risk.

As in most Mediterranean wetlands, the availability of shallow lagoons for waterbird populations critically depends on groundwater discharges from the main aquifer (6). For more than two decades, Doñana has been drying out. Although rising temperatures and rainfall shortages contribute to this trend, the World Heritage Committee has determined that Doñana's shrinking aquifer is primarily the result of groundwater pumping and upstream retrieval of river water for intensive agricultural purposes (7, 8), particularly greenhouse-grown blueberries and strawberries.

The threat that agriculture poses to Doñana was recognized by the Court of Justice of the European Union last year (9). The court reminded the Spanish government of its obligation to protect Doñana from illegal water extractions. Yet, despite the Spanish government's opposition, the regional parliament of Andalucía has approved a proposal to amnesty and legalize unregulated groundwater pumping (10).

Legalizing unregulated groundwater pumping may well be a death sentence for Doñana, known as the "jewel in the crown" of Mediterranean biodiversity hotspots (6). The citizens of Andalucía should demand that their government consider the environmental risks of the groundwater pumping proposal before ratifying it. Instead of approving unregulated groundwater pumping, the government should give rights to access surface irrigation water exclusively to farmers who are operating legally. As food retailers have suggested (11), the international community, which serves as the market for Doñana's berries, should leverage economic power to ensure that the products they consume come from sustainable agriculture and do not threaten Doñana or other protected areas. Finally, we urge UNESCO to add Doñana to the List of World Heritage in Danger (12).

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US conservation atlas needs biodiversity data

The US administration has proposed a Conservation and Stewardship Atlas that would facilitate the conservation of 30% of US lands and waters by 2030 (30x30) under its "America the Beautiful" initiative (1). To maximize the benefits of the initiative, decisions about which lands to prioritize for conservation and restoration should be based on not only an area's current protection and management status (2) but also its potential to safeguard the nation's biodiversity (3–5). A rigorous system to coordinate the collection and interpretation of spatial biodiversity data would facilitate informed decisions.

The 30x30 target is an element of the Global Biodiversity Framework, which will be finalized at the 2022 meeting of the Convention on Biological Diversity (6). The Global Biodiversity Framework emphasizes that the 30x30 target will effectively address the biodiversity crisis only if placement and management of conserved areas are coordinated with efforts to achieve targets for halting loss of ecosystems (7), species (8), and genetic diversity (9). Therefore, where conserved lands are located and what biodiversity they support

are as important as how much area is conserved (3–9). The United States, although not formally a party to the convention, has made high-level commitments to achieve 30x30 through “ecologically representative and well-connected” areas that “deliver the greatest benefits for global biodiversity, ecosystem services and climate protection” (10), but the metrics by which such benefits will be assessed remain undefined.

Although the America the Beautiful initiative includes a goal of tracking “fish and wildlife habitats and populations,” little detail is provided as to what spatial data will be collected and how it will inform decisions (1). The administration should use this opportunity to support and better coordinate efforts to track the status and distribution of the nation’s ecosystems and species within a coherent and evidence-based framework. This effort should build on existing data developed by federal, state, nonprofit, and tribal remote sensing and species monitoring programs (11). Ideally, the data would be synthesized in a manner similar to the Global Biodiversity Framework. The administration would then have the information required to make effective decisions about lands in need of conservation and restoration. Synthesized data would also help to assess conservation goals moving forward (5–9), as suggested in recent proposals for development of a National Biodiversity Assessment and Strategy analogous to the existing quadrennial National Climate Assessment (12).

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LIFE IN SCIENCE

Drifting away in the Atlantic

Floating 20 meters below the surface, in the warm Atlantic waters around the desert islands of the Cape Verde archipelago, my dive buddy and I beheld a marine biologist’s dream: schools of thousands of fish, sharks, and a beautiful underwater landscape of barely explored habitats. We were 2 weeks into a sailing trip retracing the steps of the second voyage of the HMS *Beagle*, the ship that carried Charles Darwin around the world in the 1830s. Our mission was to explore how biodiversity had thrived in the relative absence of human pressure. We had jumped from the deck of our boat, the *Captain Darwin*, just 1 hour before. The current was stronger

than expected, and dusk was approaching, but we lingered as long as we could to enjoy the amazing view. As we ascended, we tried to express to one another how incredible the dive had been using hand signs and screaming and laughing into the water. Then we surfaced and looked around for our boat. It was gone.

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We quickly realized that in the little time we had been underwater, we had drifted miles from our drop-off point. The boat’s crew could not possibly spot us from such a distance. Although there was land nearby, we had no way to access the rocky shore, pummeled by powerful waves. As the sun set, we waved

our long, red surface marker buoy high up in the air and blew our safety whistles, but to no avail. The sky darkened, and stories of regional spearfishermen taken away by the current came to mind. We tried shining our flashlights on the water to illuminate a large area that might be visible to the crew. Still, no help arrived.

Then we had an idea. We placed our flashlights inside the buoy. Bobbing in the now pitch-black ocean, the marker glowed with an intense red color, mimicking the inflatable tube figures that dance in the wind in front of car dealerships. We waited nervously, listening to the waves and gazing toward the dark horizon. Finally, we saw it: A masthead light, heading straight toward our bright red beacon.

Eduardo Sampaio

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A diver views the *Captain Darwin* from a distance.

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