The Oriental stork (*Ciconia boyciana*) is threatened by human activities in its migratory stopover points in China.

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# Aquaculture jeopardizes migrating Oriental storks

The Oriental stork (*Ciconia boyciana*), once the most common bird of the Far East, is now listed in Appendix I of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) and classified as Endangered on the International Union for Conservation of Nature's (IUCN's) Red List (*1*, *2*). Over the past few decades, illegal poaching, habitat loss, and environmental pollution have caused a decline in the Oriental stork population in its Northeast Asian breeding grounds (*3*). Fewer than 3000 individuals remained worldwide by 2018 (*2*). The Oriental stork now faces a severe survival threat at migratory stopover sites in China's Bohai coastal region, where human disturbances drive habitat degradation (*4*).

The Qilihai and Caofeidian wetland reserves, located north of the Bohai Bay, are the most important stopover sites for the Oriental stork (*5*). More than 2000 individuals refuel in these wetlands during their fall migration (*6*). However, large areas of these reserves (including about 80 to 90% of the Caofeidian wetland) have been leased to aquacultural farmers to create fishponds (*7*). The farmers dislike foraging storks and often try to scare them away with firecrackers (*4*). For aquaculture, wetlands are maintained at a relatively high water level, which makes foraging difficult for storks and prevents them from finding enough food (*4*). As a result, the storks relocate to private fishponds, where they face an increased risk of poisoning and poaching. In 2019, 19 storks were poisoned in the Qilihai and Caofeidian wetlands (*8*).

The Oriental stork has been categorized as a terrestrial species under state protection (with a beneficial, economic, or scientific value) since 2000 (*9*), but the species' extremely limited population size indicates that this designation is not enough. To better protect the Oriental stork, the Chinese government is currently updating the special state protection list and changing the protection of this bird to the highest first-class level (*10*). In addition, immediate habitat restoration is required. Fishponds in protected areas must be restored to natural wetlands to create favorable living conditions and reverse population decline. Local governments should rapidly formulate eco-compensation measures and publicize wildlife protection to mediate human-bird conflicts. Only by taking action to protect this species and its habitat can we prevent its looming extinction.

**Yanfeng Sun[1,2], Liqiang Du[3], Yuan Yin[2], Yuefeng Wu[2], Aijun Cai[3], Dongming Li[2]***
[1]Ocean College, Hebei Agricultural University, Qinhuangdao 066000, China. [2]Key Laboratory of Animal Physiology, Biochemistry and Molecular Biology of Hebei Province, College of Life Sciences, Hebei Normal University, Shijiazhuang 050024, China. [3]College of Marine Resources & Environment, Hebei Normal University of Science & Technology, Qinhuangdao 066600, China.
*Corresponding author.
Email: lidongming@hebtu.edu.cn

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# Indigenous rights to Patagonia's Guafo island

In September, private investors put 20,000-ha Guafo island up for sale for US $20 million (*1*). The island, located in northern Chilean Patagonia, is a stronghold of unique biodiversity (*2*, *3*) and a biocultural heritage site for Patagonia Indigenous groups and the country (*4*). The owners bought the island a decade

ago with plans to conduct coal mining operations (*1*), but after Chile made a climate change commitment to become carbon neutral by 2050 (*5*), the difficulty obtaining mining permits made them rethink their investment. The Chilean government should protect these valuable ecosystems by deeding the island to the Indigenous people who claim it.

The challenges facing Guafo island are emblematic of environmental problems throughout Patagonia. A growing exotic salmon aquaculture industry has brought about environmental degradation (*6*). Climate change–induced drought has led to harmful algal blooms (*6*, *7*) that may have contributed to the stranding of hundreds of endangered Sei whales (*8*). Terrestrial ecosystems face increasing tensions from tourist developments, a growing human population, peat bog degradation, exotic species invasion, and climate change (*6*), which threatens glacial freshwater reserves (*9*) and increases the likelihood of fires (*6*).

Disrespecting Indigenous peoples' heritage in Patagonia threatens the region's biodiversity. Degrading the capacity of carbon sequestration in forest soils, peatbogs, and kelp forests (*6*) and disrupting the carbon sequestration processes fostered by large whales and other marine vertebrates (*10*) will initiate a perfect storm of increasing warming and ecosystem degradation with global consequences. It is incumbent upon the Chilean government to set an example for Patagonian policy by protecting Guafo island and its surrounding seascapes, requiring that the salmon industry withdraw operations from protected waters, and giving Indigenous people the rights to their ancestral lands. In 2008, Chile passed the Mapuche-Lafkenche Marine and Coastal Areas for Indigenous Peoples (MCAIP) law (*11*). The legislation enables the allocation and administration of coastal marine areas to Indigenous communities, who can ensure the sustainability and conservation of marine resources and ecosystems. There is already an MCAIP claim for Guafo island by Indigenous communities from nearby Chiloé island (*12*), the "Wafo Wapi ancestral land for conservation." The Chilean government should support this claim.

**Pablo A. Marquet[1,2]*, Juan Carlos Castilla[1], Aurora Gaxiola[1,2], Rodrigo Hucke-Gaete[3], Alfredo Pena-Vega[4]**

[1]Departamento de Ecología, Facultad de Ciencias Biológicas, Pontificia Universidad Católica de Chile, CP 8331150, Santiago, Chile. [2]Instituto de Ecología y Biodiversidad (IEB), Santiago, Chile. [3]Programa Austral Patagonia, Instituto de Ciencias Marinas y Limnológicas, Universidad Austral de Chile, Campus Isla Teja, Valdivia, Chile. [4]Ecole des Hautes Etudes en Sciences Sociales/ Centre National de la Recherche Scientifique Institut Interdisciplinaire d'Anthropologie du Contemporain, Paris, France.
*Corresponding author. Email: pmarquet@bio.puc.cl

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# Fisheries rely on threatened salt marshes

Salt marsh ecosystems and the seascapes in which they are embedded serve as critical habitats for species harvested by fisheries (*1*), which provide food and economic security for hundreds of millions of people (*2*). Historical marsh losses coupled with increasing pressures from coastal development and climate change place these intertidal ecosystems and surrounding uplands under growing threat (*3*). Preventing further losses of salt marshes and associated fisheries production will require greater public awareness and difficult choices in coastal policy and management, underpinned by greater understanding of marsh function.

Quantifying the value of salt marsh habitat to fisheries production is challenging. Many fisheries species feed and shelter in the salt marsh only as juveniles, and it is difficult to assess the marsh's effect once they have moved to a new location (*1*). It is also unclear how marsh landscape fragmentation under sea level rise will affect fisheries; it may boost fishery production, at least temporarily (*4*), but it could also disrupt food web processes that support fisheries (*5*).

Projections of marsh expansion offer hope (*6*) but are largely dependent on changes in coastal watershed management. For instance, human development may prevent marshes from migrating upland with sea level rise and thus lead to marsh drowning (*7*). Adequate sediment supply is also essential for marsh resilience, but many coastal areas in the world are sediment-starved (*8*). Much effort has been made to restore natural riverine flow and other sources of sediment delivery into marshes, although such efforts may have negative impacts on the very fisheries these marshes support (*9*).

To design effective policies for salt marsh restoration and conservation that protect fisheries production, we need to better understand the role of salt marshes. Researchers should continue to explore the fundamental linkages between salt marshes and fisheries (*10*), the marsh habitat value within the context of the interconnected and increasingly urbanized mosaic of coastal ecosystems, and the value of salt marshes created by upland transgression and active engineering. Restoration and conservation planning must take a long-term view that specifically recognizes sea level rise and its interaction with other anthropogenic stressors.

**Ronald Baker[1]*, Matthew D. Taylor[2], Kenneth W. Able[3], Michael W. Beck[4], Just Cebrian[5], Denise D. Colombano[6], Rod M. Connolly[7], Carolyn Currin[8], Linda A. Deegan[9], Ilka C. Feller[10], Ben L. Gilby[11], Matthew E. Kimball[12], Thomas J. Minello[13], Lawrence P. Rozas[14], Charles Simenstad[15], R. Eugene Turner[16], Nathan J. Waltham[17], Michael P. Weinstein[18], Shelby L. Ziegler[19], Philine S.E. zu Ermgassen[20], Caitlin Alcott[21], Scott B. Alford[22], Myriam A. Barbeau[23], Sarah C. Crosby[24], Kate Dodds[25], Alyssa Frank[1], Janelle Goeke[26], Lucy**

**A. Goodridge Gaines[11], Felicity E. Hardcastle[11], Christopher J. Henderson[11], W. Ryan James[27], Matthew D. Kenworthy[28], Justin Lesser[27], Debbrota Mallick[1], Charles W. Martin[22], Ashley E. McDonald[26], Catherine McLuckie[29], Blair H. Morrison[1], James A. Nelson[27], Gregory S. Norris[23], Jeff Ollerhead[30], James W. Pahl[31], Sarah Ramsden[1], Jennifer S. Rehage[32], James F. Reinhardt[33], Ryan J. Rezek[34], L. Mark Risse[35], Joseph A.M. Smith[36], Eric L. Sparks[37,38], Lorie W. Staver[39]**

[1]Department of Marine Sciences, University of South Alabama, Dauphin Island Sea Lab, Dauphin Island, AL 36528 USA. [2]Port Stephens Fisheries Institute, New South Wales Department of Primary Industries, Nelson Bay, NSW 2315, Australia. [3]Department of Marine and Coastal Sciences, Rutgers, State University of New Jersey, New Brunswick, NJ 08901, USA. [4]Institute of Marine Sciences, University of California, Santa Cruz, CA 95062, USA. [5]Northern Gulf Institute, Mississippi State University, Stennis Space Center, MS 39529, USA. [6]Department of Environmental Science, Policy, and Management, University of California, Berkeley, Berkeley, CA 94720, USA. [7]Australian Rivers Institute–Coast & Estuaries, School of Environment and Science, Griffith University, Gold Coast, QLD 4222, Australia. [8]National Oceanic and Atmospheric Administration (NOAA) National Centers for Coastal Ocean Science, Beaufort, NC 28516, USA. [9]Woodwell Climate Research Center, Falmouth, MA 02540, USA. [10]Smithsonian Environmental Research Center, Edgewater, MD 21037, USA. [11]School of Science and Engineering, University of the Sunshine Coast, Maroochydore, QLD 4558, Australia. [12]Baruch Marine Field Laboratory, University of South Carolina, Georgetown, SC 29442, USA. [13]NOAA Fisheries, Southeast Fisheries Science Center, Galveston, TX 77551, USA. [14]NOAA Fisheries, Estuarine Habitats and Coastal Fisheries Center, Lafayette, LA 70506, USA. [15]School of Aquatic and Fishery Sciences, University of Washington, Seattle, WA 98195–5020, USA. [16]Department of Oceanography and Coastal Sciences, Louisiana State University, Baton Rouge, LA 70803, USA. [17]Centre for Tropical Water and Aquatic Ecosystem Research, and Marine Data Technologies Hub, College of Science and Engineering, James Cook University, Townsville, QLD, 4811, Australia. [18]New Jersey Marine Sciences Consortium, Fort Hancock, Sandy Hook, NJ 07043, USA. [19]Moss Landing Marine Laboratories, Moss Landing, CA 95039, USA. [20]Changing Oceans Group, School of Geosciences, Grant Institute, University of Edinburgh, EH9 3FE, UK. [21]Interfluve, Hood River, OR 97031 USA. [22]University of Florida, Institute of Food and Agricultural Sciences, Nature Coast Biological Station, University of Florida, Cedar Key, FL 32625 USA. [23]Department of Biology, University of New Brunswick, Fredericton, NB E3B 5A3, Canada. [24]Harbor Watch, Earthplace, Inc., Westport, CT 06880, USA. [25]Department of Biological Sciences, Macquarie University, Sydney, NSW 2109, Australia. [26]Department of Marine Biology, Texas A&M University at Galveston, Galveston, TX 77554, USA. [27]Department of Biology, University of Louisiana at Lafayette, Lafayette, LA 70504, USA. [28]Department of Marine and Environmental Sciences, Savannah State University, Savannah, GA 31404, USA. [29]Department of Environmental Science and Management, University of Newcastle, Ourimbah, NSW 2258, Australia. [30]Geography and Environment Department, Mount Allison University, Sackville, NB E4L 1E4, Canada. [31]Louisiana Coastal Protection and Restoration Authority, Baton Rouge, LA 70802, USA. [32]Institute of Environment, Florida International University, Miami, FL 33199, USA. [33]NOAA Fisheries, Restoration Center, Silver Spring, MD 20910, USA. [34]Department of Earth and Environment, Institute of Environment, Florida International University, Miami, FL 33199, USA. [35]University of Georgia Marine Extension and Georgia Sea Grant, Athens, GA 30602, USA. [36]U.S. Fish and Wildlife Service, Galloway, NJ, 08205, USA. [37]Coastal Research and Extension Center, Mississippi State University, Biloxi, MS 39532, USA. [38]Mississippi Alabama Sea Grant Consortium, Ocean Springs, MS 39564, USA. [39]University of Maryland Center for Environmental Science, Horn Point Laboratory, Cambridge, MD 21617, USA.

*Corresponding author. Email: rbaker@disl.org

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