Kelp forests face a range of threats.

Edited by **Jennifer Sills**

Protect kelp forests

Kelp forests support biodiversity, human livelihoods, and essential ecosystem services along 30% of the world's coasts, but they are under threat from marine heatwaves, harvesting, pollution, and overfishing (*1*). Despite increased advocacy for their global protection, including the International Union for Conservation of Nature Seaweed Specialist Group (*2*) and the Kelp Forest Challenge (*3*), the social and ecological losses from kelp forest degradation continue to grow (*4*). Political action will be required at national and international levels to coordinate and implement strategic, integrated, tangible protection measures for kelp forests globally (*5*).

Most countries have committed to the Kunming-Montreal Global Biodiversity Framework and pledged to effectively protect and manage 30% of marine ecosystems by 2030 (*6*), particularly those critical for biodiversity. However, only 2.9% of the ocean is currently inside fully protected Marine Protected Areas (MPAs) (*7*), which are the most effective tool for biodiversity conservation (*7*) and climate resilience (*8*). Moreover, the framework does not specify which ecosystems should be prioritized.

About 35% of floating kelp forests are located in the waters of Latin American countries (*9*), which remain far from meeting the 2030 targets. Mexico has lost more than 50% of its kelp forests as a result of recent marine heatwaves (*10*). Chile and Peru have witnessed large-scale degradation from direct extraction (*11*), leading to drastic biodiversity loss.

Given climate projections of accelerating marine heatwaves throughout the 21st century (*12*), governments, in consultation with local communities and stakeholders, should prioritize the protection of kelp forests. Each country's national environmental policies should aim to include the meaningful protection of 30% of its kelp forests by 2030, consistent with the Biodiversity Framework. Strategies should include expanding fully protected MPAs, improving the management and enforcement of existing MPAs, implementing targeted protection and restoration measures for overharvested kelp populations, and identifying and protecting areas that are less affected by climate change for kelp ecosystems (i.e., climate refugia). Taking these actions will enhance global biodiversity conservation, food security, and cultural and socioeconomic needs, leading to equitable outcomes for local and Indigenous coastal communities.

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Protect China's coastal salt marshes

Coastal ecosystems, such as salt marshes, mangroves, and seagrass meadows, have markedly high carbon burial and long-term carbon sequestration capacities (*1*). To protect coastal wetlands, China has implemented more than 1000 ecological restoration projects (*2*), built more than 2200 wetland nature reserves (*3*), and promoted legislation for ecological restoration and trading of carbon stored in marine and wetland environments (i.e., blue carbon) (*3*). However, efforts to protect mangroves and seagrass meadows have outpaced investment in salt marshes (*4*). Given that salt marshes account for more than 75% of China's coastal wetlands (*5*), China should focus more resources on their protection.

Coastal salt marshes account for about 80% of the carbon burial in China's coastal blue carbon ecosystems, with a total carbon storage of about 25 Tg (*6*). The native plant *Suaeda salsa* in coastal salt marshes is also an important habitat for vulnerable species, such as red-crowned cranes (*Grus japonensis*) and Saunders's gulls (*Chroicocephalus saundersi*) (*7*). However, port construction, reclamation of mudflats, and aquaculture development have led to the degradation or disappearance of at least 7080 km^2 of coastal salt marshes (*5*). Because China has implemented few national-level protection and restoration plans for coastal salt marshes, the area of restored salt marshes makes up less than 10% of the degraded area (*8*).

Unlike salt marshes, mangroves and seagrass meadows have been prioritized by the Chinese government, and substantial conservation actions have been implemented. For example, national laws have established special provisions for mangroves (*9*), and China has implemented the Special Action Plan for Mangrove Conservation and Restoration (2020–2025) (*10*). The National Important Ecosystem Protection and Restoration Project Plan (2021–2035) highlights seagrass meadows (*11*). As a result of these policies, 40% of mangrove areas (*6*) and 27% of seagrass meadows (*6*, *12*) have been restored.

The low priority given to coastal salt marshes in China means that the government, enterprises, and individuals lack incentives to develop ecological restoration projects targeting these ecosystems. To increase protection efforts, the Chinese government should develop national standards and restoration plans specifically for coastal salt marshes. As it has done to protect mangroves, China should establish a government department dedicated to the protection of salt marshes, increase financial support for salt marsh restoration, and incorporate the carbon benefit of salt marshes' restoration into the carbon market. These actions would ensure that China devotes the required resources to salt marshes, which would help to raise awareness about their importance for carbon capture and biodiversity.

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Consistent H5N1 control needed for farm animals

An avian influenza A-H5N1 virus (clade 2.3.4.4b) has infected and killed hundreds of millions of wild and domesticated birds, thousands of wild mammals and farmed fur animals, and some pets (*1*), exhibiting the characteristics of a panzootic disease (*2*). H5N1 has recently spilled over into cattle in the US, refuting theories that cattle were not susceptible to infection by influenza A viruses (*3*). As of 15 October, the H5N1 strain of avian influenza has been found in 300 cattle farms in 14 US states (*4*). The virus has also infected 20 human beings (*5*). US guidelines for managing H5N1 infections differ widely between poultry and cattle. To ensure the reduction of spillover risk of a zoonotic virus with pandemic potential, jurisdictions with infected animals should adopt effective, ethical policies and apply them consistently to all farmed species.

Strict avian flu control procedures are in place in the US and in the European Union (EU) for poultry. When an infection is detected, the local health authority is required to cull all birds (*6*, *7*), and the movement of infected biological material from the premises is restricted (*6*, *7*). In addition, because trade bans apply to vaccinated animals and their products, vaccinating poultry is prohibited in the US and allowed only in rare exceptions in the EU (*6*, *7*).

Restrictions for US cattle farms where A-H5N1 has been found are substantially less stringent than those for poultry. No culling policy has been implemented, nor has any ban on moving infected animals been put into effect (*8*). The disposal and destruction of biological material, including milk, from infected cows is recommended but not compulsory, even though raw milk is authorized for human consumption in some US states. California (*9*), for example, has had more than 100 avian flu outbreaks in dairy between September and mid-October (*5*), and no ban on raw milk consumption has been imposed. Vaccines for cattle are under development and will most likely become a widespread tool to control the spread of infection (*10*).

Given that A-H5N1 appears to be a panzootic virus that is likely to infect additional species, its control strategies should be reviewed as the situation evolves. Decision-makers should urgently determine which policy most effectively mitigates disease spread and zoonotic risk and implement that strategy consistently across species. If vaccination is found to be most effective, reasonably priced vaccines should be made available to the poultry and cattle sectors, and trade barriers for vaccinated animals should be reconsidered.

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