

# The State of the World's Mangroves 2022

## Executive Summary

### Ecosystems worth investing in

Mangroves are now widely valued, for their biodiversity and for their contribution to human society, both locally and globally. The Global Mangrove Alliance (GMA) is striving to increase visibility of these essential ecosystems and to set ambitious goals for their conservation and restoration.

Our inaugural publication, *The State of the World's Mangroves 2021* highlighted remarkable new science and described critical policy approaches and on-the-ground actions for mangrove conservation. In so doing it helped to increase GMA membership, to catalyze further conservation activities, and to unlock new funding opportunities for mangrove restoration. This year, our report highlights the GMA members and describes the revised goals of our Alliance. We describe important new research findings and policy developments. We also shine a spotlight on mangrove restoration, including research, tools, and stories from the field.

The Global Mangrove Alliance has generated a revised goal for 2030, to ensure the long-term security of mangroves and the people who depend on them. It can be summarized in six words:

**Halt loss, restore half, double protection.**



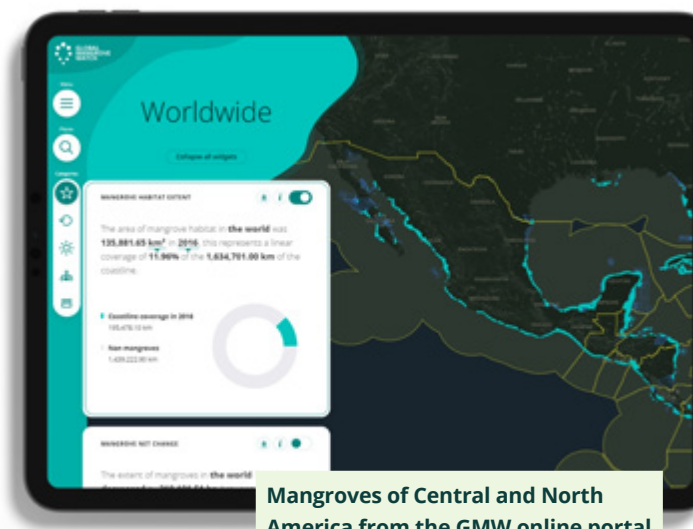
Halting loss means bringing losses to zero by 2030, equating to 168km<sup>2</sup> of avoided loss of mangroves. Restoring half refers to the recorded losses (since 1996), and equates to some 4,092km<sup>2</sup> of restoration.

Doubling protection refers to the area of mangroves that are managed in protected areas or have equivalent levels of protection, equating to a further 40% of mangroves, or 61,000km<sup>2</sup> secured for a long-term future by 2030.

### The state of mangroves

Central to this report are the newly completed global maps from the Global Mangrove Watch (GMW) team, offering more extensive and more reliable maps than before, updated to 2020. The new maps show 147,000km<sup>2</sup> of mangroves globally, an apparent increase on previous estimates, but based on improved maps rather than real gains.

The same maps allow changes to be detected over time. They indicate losses of 11,700km<sup>2</sup> since 1996, but also considerable gains, mainly in river mouths and deltas, leading to an estimate of net loss since 1996 of 5,245km<sup>2</sup>. Rates of loss have also greatly diminished, with averaged losses over the last decade of just 66km<sup>2</sup> or 0.04% of all mangroves per year.



Mangroves of Central and North America from the GMW online portal



Mangroves and coral reefs in Tanzania, critical resources for coastal peoples © Mark Spalding

Losses are likely driven by a combination of direct human impacts such as clearance and conversion, but also by harder to manage changes driven by erosion or inundation or storms.

Developing a better measure of the threats to mangroves in different places provides a tool for effective management, and so there are growing moves to develop threat categorizations under the framework of the IUCN Red List of Ecosystems (RLE). In this report we highlight where this approach has already been applied to mangroves from continental to local scales, and we highlight the calls for a global assessment.

The dynamic nature of mangroves is also highlighted by independent research on *Global Tidal Wetlands Change* which has looked at change over time in mangroves, mudflats, and tidal marshes. In many cases apparent losses of one particular ecosystem represent transitions to another ecosystem.

Recognizing the interconnectedness, indeed the interdependence, of coastal ecosystems may greatly help our ability to manage them more holistically, and to increase their resilience.

The new mangrove maps provide a baseline for updated models of carbon storage in both aboveground biomass and mangrove soil. These updates confirm the importance of mangroves as carbon stores while

highlighting the enormous spatial variation in this value. They have also been used to show that restoration of losses since 1996 could safeguard carbon in soil and aboveground biomass equivalent to 1.27 gigatons of CO<sub>2</sub>.

Another key benefit from mangroves is the production of commercially important fish, crustaceans and molluscs. Last year's report highlighted that 4.1 million fishers depend on mangroves. In a new model presented here, it is estimated that mangroves support the production of nearly 600 billion young of shrimp and fish species, as well as 100 billion individuals of crabs and bivalves.

### A focus on restoration

Aside from protecting mangroves, restoration provides an opportunity to regain lost benefits to coastal communities and beyond. Not all lost mangroves are restorable: some lie in areas where the threats cannot be reversed.

**4.1 million fishers benefit from the production of billions of young fish each year in the mangroves. Aceh Province, Indonesia**

© Junaidi Hanafiah, TNC Photo Contest

**The GMW map has been the basis and starting point of much of the analyses that have provided us such valuable insights into the world of mangroves.**

Equally, restoration is not always easy, although our understanding on how to restore has greatly improved.

The new map of mangrove restoration potential described here builds on the GMW extent and change maps, identifying all areas of loss from 1996 to 2020, and from these determining those areas that are restorable, a total of 8,183km<sup>2</sup>, with particular concentrations of such areas in Southeast Asia.

The model further presents a "restorability" score determined by the likely ease of restoration in these areas, and, using the other models, enables the prediction of likely benefits of restoration in terms of carbon and fisheries benefits.

Restoration efforts have failed in many places, but such failures are usually preventable if science-based methods are implemented. The GMA, together with the [International Blue Carbon Initiative](#), is currently developing a guide for mangrove restoration featuring

a decision tree structure. Broadly it highlights three key stages: pre-implementation (funding, planning and identifying goals), implementation (using best practices, and targeting local needs), and post-implementation (monitoring and learning).

In parallel to these guidelines, other GMA supported work is developing a Mangrove Restoration Tracker Tool (MRTT). With input from over 80 practitioners and scientists, this tool will encourage and support restoration practitioners to track vital information across the lifetime of a project. It will further enable learning and information exchange between practitioners, facilitating the scaling up of restoration efforts to meet ambitious global targets.



**Mangrove seedlings ready for a restoration project in Haiti** © Tim Calver



**Cattle egret, Jamaica** © Tim Calver

Another project supported by the GMA will be a set of guidelines to support the utilization of Local Ecological Knowledge (LEK) in mangrove conservation and restoration. Local peoples often have a deep understanding and an unparalleled historical knowledge of their mangroves, and can provide vital local context to research on animals, plants, and interactions between humans and the environment.

### Progress and policy

The determination to safeguard mangroves is growing at all levels from international to local. Coastal ecosystems are central in many global forums such as the recent Glasgow Climate Pact and 2022 UN Ocean Conference. Reliable, broad-scale science of the type described here provides a bedrock and a baseline in encouraging and supporting such policy development.

At the same time, all practical implementation of mangrove conservation and restoration depends on action on the ground, and legal frameworks and management approaches must be tailored to a local context. Here too, the supportive work of the GMA, in providing tools, models and case-studies is vital in enabling planning, implementation, and reporting.

Soon we will be entering the UNFCCC Global Stocktake process, whereby countries will report on their progress towards meeting their goals towards achieving the Paris Agreement and where new ambitions may be set. Several GMA members were involved in developing a [guidance document](#) to help countries translate how ocean-relevant actions can contribute to the Stocktake process. Similarly, the GMA has been a partner in developing a guidance document for mangrove inclusion into the Post-2020 Global Biodiversity Framework.

Two major UN Decades run through 2030: the [UN Decade on Ecosystem Restoration](#) and the other on [Ocean Science for Sustainable Development](#).



Mangrove Side Event at COP23 in Bonn © Dominik Ketz

The GMA is an official implementing initiative of the UN Decade on Ecosystem Restoration, working to raise ambition on mangrove restoration and track and monitor progress through the Global Mangrove Watch.

The GMA is also supporting more ambitious goals for mangrove protection. Almost 42% of the world's mangroves are already in protected areas, but their value is enough to merit stronger commitments. There are also disparities: some important mangrove countries protecting less than 5% of their mangroves, and some existing protected areas are poorly managed and fail to prevent mangrove loss and degradation.

Future ambition from the GMA to double protection includes the need to recognize and include Other Effective Area-Based Conservation Measures (OECMs) that can offer de facto protection alongside more traditional protected areas.

The online [GMW platform](#) is being continually improved to support all those interested in mangroves, and new tools have been developed that may aid policy development and tracking progress. In relation to the Global Stocktake process, for example, users can now see which protected areas in their countries contain mangroves, and this data can be paired with the change and loss data.

The forthcoming Climate and Policy Dashboard will also display policy data, illustrating how mangrove restoration and conservation could help individual countries to meet key policy goals. This will include a list of the countries' NDC targets for mitigation and adaptation, alongside information on the mitigation potential of different management actions. The platform also includes a Mangrove Tree Species widget showing the mangrove species native to each country.

Another new feature will soon allow users to draw around areas of interest and to generate associated statistics, opening the door for monitoring of specific project sites.

The GMA continues to be a rapidly growing alliance of key partners and practitioners, enabling remarkable work for the future of mangroves at all scales. Matching this growth, the GMA has developed a new initiative, with the creation of National GMA Chapters that bring together GMA members and local partners on the ground in interested countries. The collective voice of a GMA national chapter can have more influence on national and local policies, as well as a larger impact through joint strategies and projects, and increased opportunities for fundraising. The national chapters also benefit from access to the GMA resources and team of experts.

Mangroves are vital ecosystems. In this review we offer multiple points of hope: declining losses, better understanding of values, a vision for restoration, growing political commitments, and ever stronger partnerships and alliances.

The tide has yet to turn, but we believe it will. The benefits will be global, and they will reach beyond mangroves – supporting the growing efforts to halt irreversible climate change, and the wider biodiversity crisis. It is essential to maintain the momentum and to keep growing our efforts and collaborations. Together we are making great strides.

Rio Coto de Puntarenas, Costa Rica © Humberto Rodriguez, TNC Photo Contest