

The reserve plan

Today 8% of **marine areas** are protected. But trawling is prohibited in only 1/4 of them, destroying entire habitats. Not even in the **Maldives**. Where, however, the first reserves based on scientific criteria will be created, thanks to the **University of Milan**.

by Vito Tartamella

STUDY

A marine biologist enters scientific data on a tablet while diving on coral reefs in the Maldives, one of the world's biodiversity "hot spots".

Drains that pour sewage into the sea. Plastic waste burned on the beaches. Islands and artificial pools built on coral reefs. Fishing trips made by throwing bombs or cyanide into fish holes. And few, very few checks by the authorities. It is the other side of the Maldives: its splendid turquoise waters are threatened by irresponsible habits, by mass tourism (1 million and 700 thousand tourists a year) and by the warming of the seas, which has destroyed corals last time in 2016. A degraded paradise, despite its waters including 79 marine parks and a Unesco world biosphere reserve, Baa Atoll. Its coral reefs, seventh largest in the world, “have one of the most worrying levels of degradation on a planetary level”, denounces Professor Roberto Danovaro, president of the Anton Dohrn Zoological Station.

But the Maldives are not, unfortunately, an isolated case. Today, the almost 18,000 marine reserves in the world protect over 28 million km² (the same as the territories of Russia and Canada combined). But only one in 5 checks management results. And only 2.4% of the seas have effective protection, not only of the seabed but also of the fish: these are the “No take zones”, where not only mining from the seabed is prohibited, but all forms of fishing. In the other protected areas, however,

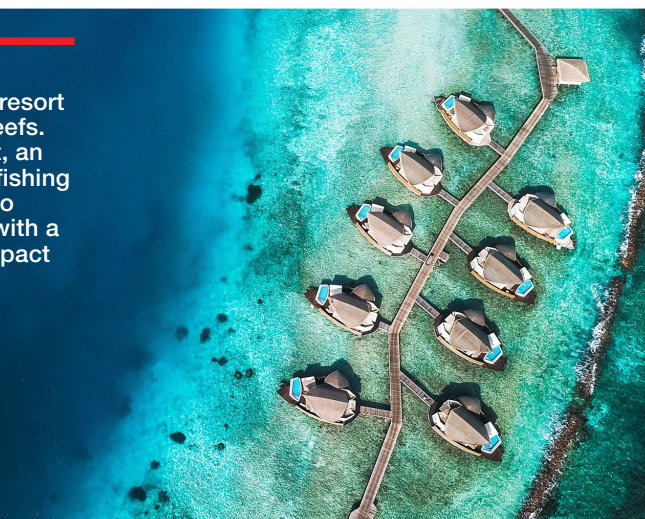


Christian Alund/Greenpeace

THREATS

Maldives, resort on coral reefs. On the left, an industrial fishing vessel. Two activities with a serious impact on nature.

Getty Images



where fishing is permitted or controls are scarce, one of the most devastating activities for the marine environment continues undisturbed, with a far worse impact than plastic and pollution: industrial bottom trawling, which produces high CO₂ emissions and devastates all life forms on the seabed, from corals to algae, to posidonia, killing fish species.

INDUSTRIAL EXPLOITATION

And this is not happening only in developing countries, such as the Maldives, which are more vulnerable to the appetites of multinational corporations. It even happens in Europe: in 59% of protected areas, denounced in *Science* journal Manuel Dureuil of Dalhousie University (Canada), trawling is even 38% more intense than in marine areas without protection. «Widespread industrial exploitation of marine protected areas undermines global biodiversity conservation goals,» concludes the study, published in 2018. «Large protected areas in Europe

have banned mining and dumping at sea, but no they occupy the most widespread industrial activity, trawling», concludes Boris Worm (Dalhousie University). «In the Old Continent, fishing is regulated by the European Union, while natural conservation policies are managed by individual countries. And so one hand doesn't know what the other is doing.»

Research has revealed the limits of a formula that has almost 60 years of history. The first legally protected coastal area was the Royal National Park, in New South Wales, Australia, in 1879. But it was only in 1966 that the Tokyo Marine Parks Committee gave impetus to the protection of the oceans, promoting the establishment of protected areas. Even if almost half have been established in the last 10 years alone, driven by the UN goal of protecting at least 30% of the oceans by 2030, 10% of which strictly. A necessary measure, considering that the oceans cover almost 3/4 of the earth's surface. Today, however, we have protected 8.09% of it, and only a quarter of it rigorously.

Indeed, when protected areas are really respected, the re- ➤

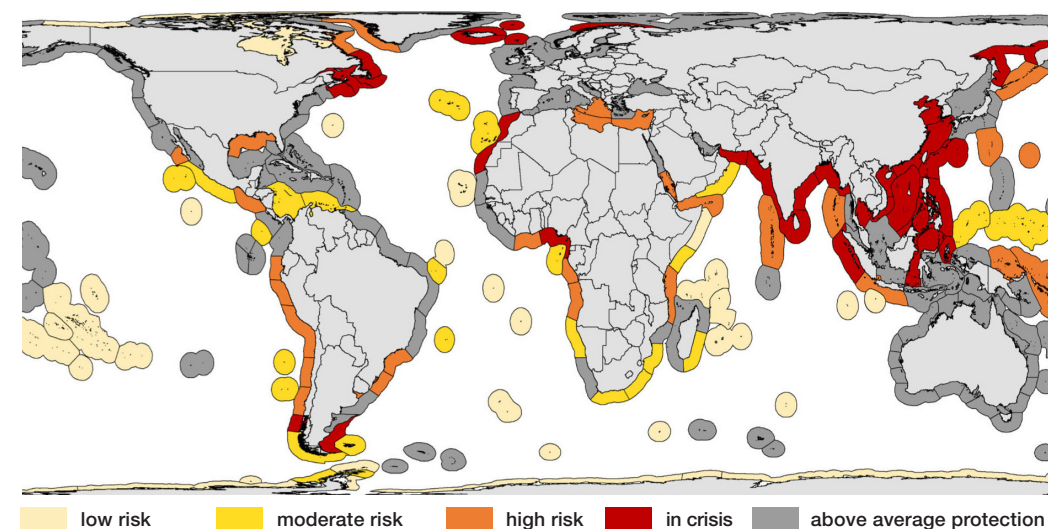


SUBMERGED SANCTUARY

Turtle and fish in the waters of the Sanctuary for marine mammals, a protected area in the Mediterranean between Liguria and the north coast of Sardinia.

In **Europe** trawling in the reserves is **38%** more intense than in the others marine areas, with serious damage to habitats

THE POORLY PROTECTED AREAS (AND THOSE MOST AT RISK)

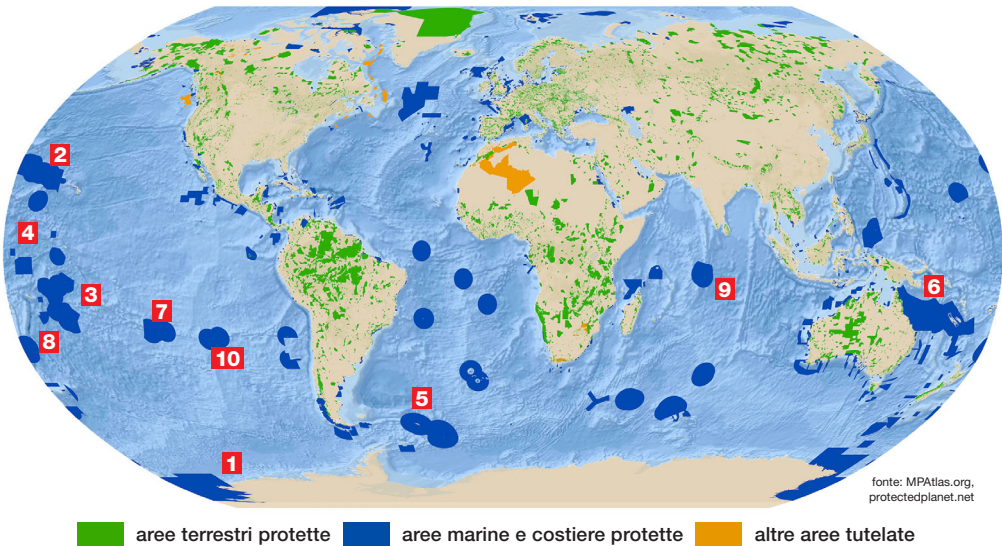


Source: Caitlin D. Kuempel "Quantifying biases in marine protected area placement relative to abatable threats", su "Conservation Biology" 2019

A group of Australian and US scientists has identified 116 poorly protected marine ecoregions in the world (with a percentage of protection lower than the world average). Of these, 28.5% are low risk ecoregions, 19.8% moderate risk, 25% high risk (including the Levantine Aegean Sea and the Ionian Sea) and 26.7% already in crisis, concentrated mostly in the Indo-Malay area, one of the world's hotspots for biodiversity.

Franco Benini/Blasphoto/Bes Photo/Mondadori Portfolio

MARINE PROTECTED AREAS IN THE WORLD8.09% of the total



72% of the world's marine protected area is found in 36 very large marine protected areas. **World's 10 Largest:**

- 1 Ross Sea 1,549,000 km²
- 2 Papahānaumokuākea (Usa) 1,508,870 km²
- 3 Coral Sea Natural Park (Francia) 1,368,806 km²
- 4 Remote Islands of Pacific (Usa) 1,270,000 km²
- 5 Sandwich Islands and South Georgia (Uk) 1,000,700 km²
- 6 Commonwealth Coral Sea Reserve (Australia) 989,842 km²
- 7 Pitcairn Islands (Uk) 834,334 km²
- 8 Terres Australes Françaises (Francia) 673,000 km²
- 9 Chagos (Uk) 545,000 km²
- 10 Rapa Nui Rahu (Cile) 631,368 km²

8.09% of the total

There are 17,783 marine reserves in the world for a total area of 28.1 million km² (as Russia and Canada combined), equal to **8.09%** of the total marine areas; only **2.4%** are high protection areas. Assessments of management effectiveness are made in only **18.3%** of the areas. **33.9%** of the world's key biodiversity areas have no protection. The goal (established by the UN Strategic Plan for Biodiversity) is to reach 30% of marine protected areas, of which 10% are highly protected.

Protected Areas Today (target: 30%)	8.09%
of which strictly protected (target: 10%)	2.4%
Marine reserves declared Unesco world heritage sites	2.1%
Land area occupied by the oceans	71%

Countries with the highest % of marine protected areas (relative to territorial waters):
Slovenia 100%
Monaco 99,8%
New Caledonia 96,6%
St. Martin 96,4%
Palau 82,9%

Marine parks are often established without **scientific studies**. And many areas of biodiversity are **uncovered**

sults are tangible. Not only from an ecological point of view but also from an economic point of view: in rigorously protected areas, ascertained a meta-analysis by Eric Sala in the *ICES Journal of Marine Science*, the quantity of fish is 6.7 times higher than in unprotected ones and the their size is significantly larger. A repopulation that also infects the adjacent areas, where the surplus lobsters, tunas and scallops are poured into, «allowing the fishermen to offset the costs of closing an area in just 5 years», writes Sala.

This is why, concludes the latest *Protected Planet* report from the United Nations Environment Programme, «the need for more and better protected areas is more urgent than ever». Yes, but how can we better protect the seas?

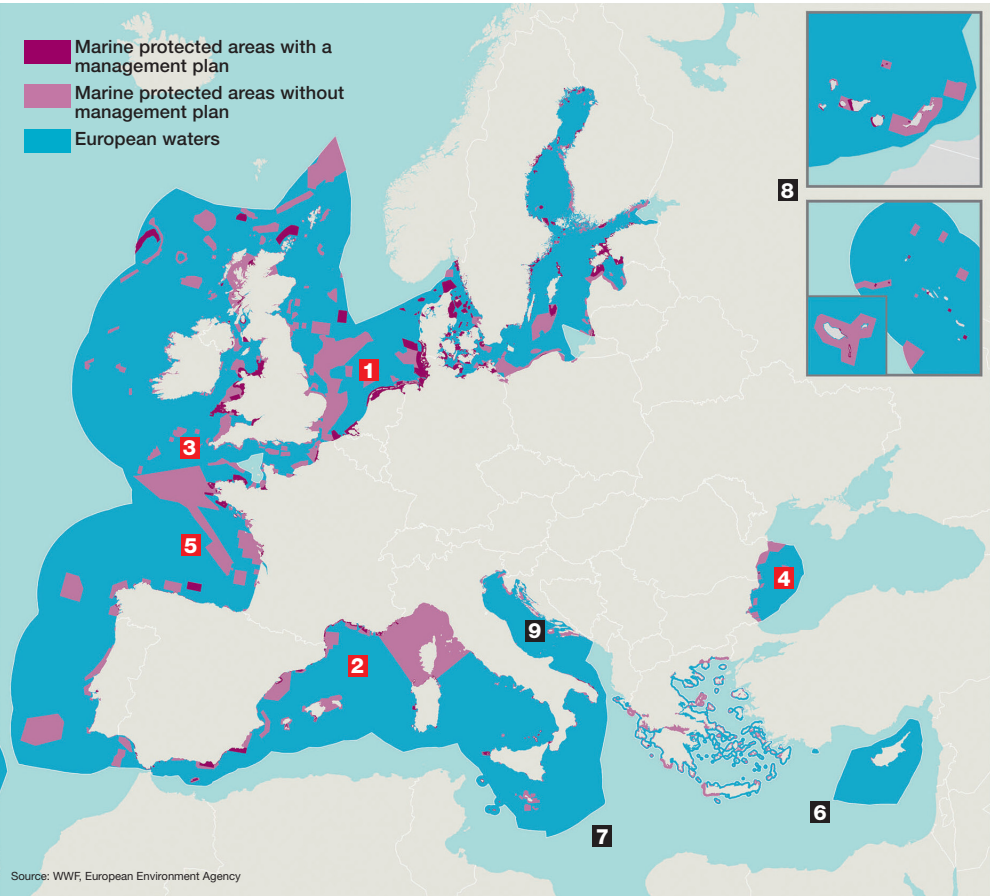
3D PROTECTION

One solution is called the “vertical ocean”, and it will be adopted in the Maldives thanks to an Italian university: the Bicocca of Milan. Last June, in fact, the university signed a memorandum of understanding with the Ministry of the Environment of the Maldives which marks a revolution in the concept of marine reserves: «They will be protected», explains Paolo Galli,

professor of ecology at Bicocca, «not only the sea and the coral reefs within 12 miles of the coasts, but also the air column up to 2 km of altitude, to protect the birds, and the water column up to 2 km of depth. We want to protect the coral reef but also the mangroves and the beaches where the turtles lay their eggs. We will protect the environment as a single ecosystem: in essence, we will apply the protection legislation of European parks to an equatorial environment. But, before proposing the establishment of new parks, we will carry out a survey of the existing ones, which are often punctiform or only on paper. We will study the habitats and identify areas that are really worth protecting.»

The agreement did not come out of nowhere: in 2009 Bicocca had opened the first university research center in the country for the study of marine biology in the Maldives, on Magoodhoo island. Now, thanks to 1.5 million euros allocated by the University and Pnrr (National resilience recovery plan), over the next 3 years a team of 20 people from the Milanese University will study the habitats of the 1,192 coral islands of the atolls, scattered over an area of 90,000 km²: almost 4 times the territory of Sardinia.

MARINE PROTECTED AREAS IN EUROPE12.4% of the total



As regards European seas, **12.4%** are in protected marine reserves. But only **1.8%** of them have management plans. Coastal protected areas are 6 times higher than those offshore. Therefore several deep marine habitats are not represented within the network. About half of Europe's protected areas measure less than 30 km², and many of them are less than 5 km².

The European strategy for biodiversity foresees the protection of **30%** of the marine area by 2030.

Seas with the greatest amount of protected areas:

- 1 North Sea (27.1%)
- 2 Western Mediterranean (19.6%)
- 3 Celtic Sea (14.2%)
- 4 Black Sea (14.2%)
- 5 Bay of Biscay (9.9%)

Less protected seas:

- 6 Levantine Aegean Sea (2.6%),
- 7 Ionian Sea (3%),
- 8 Macaronesia (Azores, Canaries and Cape Verde: 3.3%)
- 9 Adriatic Sea (5.8%)

WET ANALYSIS

Maldives, students of the Marine Sciences degree course at Bicocca in Milan collect samples to analyze the plankton present in sea water.

A FORMULA THAT PAYS OFF

The approach is not obvious: often, in fact, the establishment of a protected area is not based on rigorous scientific studies. And the results are visible. Caitlin Kuempel, of the University of Queensland (Australia), verified how many of the most biodiverse marine regions are protected as protected areas: less than 2%. And more than half of them (60 ecoregions) are already in crisis or at high risk of crisis, especially in the Indian Ocean and the Sino-Malay region, among the main global biodiversity hotspots. The list also includes the south-eastern portion of the Mediterranean, considered to be at high risk of crisis.

Why does this happen? Often the parks are established without in-depth studies on marine biology, and sometimes less fishy areas are protected so as not to displease the fishing industry. Or the marine areas straddling several nations are not connected: but the fish move without worrying about political borders.



And, above all, little is invested in the protection of the seas: «Establishing a global network of marine areas covering 30% of the ocean could cost 19 billion dollars a year, a fraction of the allocations that governments have given to industries that they pollute the planet», argues Sala. «Protecting the seas could create over a million jobs, thanks to ecotourism. On average, for every dollar invested in protected areas, at least 6 return.»

And, for developing countries, there is another option: cancel part of their sovereign debt to finance initiatives to protect the sea. In 2015, the Seychelles did it, being able to cancel almost 22 million of the national debt in exchange for greater protection of their waters: the US conservation group The Nature Conservancy (Tnc) bought the debt, in exchange for the commit- ▶

An underwater photograph showing two divers in the foreground, one holding a clipboard and the other a tablet, surrounded by a dense field of green, branching coral. The water is clear and blue. In the background, more coral and possibly other divers are visible.

REHABILITATED

Maldives: submerged coral farms. Once grown they will be put back into the damaged cliffs.

For every dollar invested in the protection of the sea, 6 are obtained from **ecotourism** and more abundant **fishing** in nearby areas

ment to create 13 new marine protected areas.

But establishing a marine area is not enough. To avoid the risk that a park remains on paper, its effectiveness must be measured with objective and transparent tools: «Many countries do not have sufficient resources to monitor the effectiveness of marine parks or have not identified objective criteria to evaluate it», writes the *Protected Planet* report. And sometimes the willingness to report on achievements «may be limited by political sensitivities, such as the concern of losing funding in case of poor results».

And, before that, we need to create a new culture towards the sea. «Fishermen often fear that the establishment of a protected area could jeopardize their activity», explains Galli. «We need to involve them and make them aware of the importance of preserving the resources of the sea. And, more generally, the Maldives need to rethink all the activities that have an impact on the environment: the treatment of waste water, waste (often burned on the beach, including plastics), the production of energy and food».

POOLS ON THE ATOLL

Speaking of fishing techniques, in the Maldives fishermen generally have an ecological approach such as line fishing: «They go offshore, throwing damselfish (small fish) as pasture», says Simone Montano, marine biologist from Bicocca. «When the shoals of skipjack tuna approach to eat them, they turn on several sprinklers on the sides of the boat that shoot water into the sea. And in those waters full of bait and bubbles, tuna bite into anything: just throw a line without bait, the fish hook up to the hook and are caught one by one. Without risking fishing for other species (sharks, dolphins, turtles) or disfiguring the seabed».

But many fishermen use brisk manners: «They throw bombs or spray cyanide into the fish's holes to knock them out. Two deadly techniques for the environment», adds Danovaro, who is on the scientific council of the Maldivian Research Center. «In fact, on the islands managed by foreign multinationals there is no control: they have even built swimming pools by

digging into the coral reefs or have surrounded them with bags of cement. If you then add the effects of overheating and acidification of the seas, we can understand the degradation of the coral atolls of the Maldives».

MOBILE BORDERS

Furthermore, climate change is also opening up new geopolitical issues as well as ecological ones. «If rising sea levels wipe out island nations like the Maldives, Seychelles, Tuvalu and many others, what about them? A State, to be recognized as such, must have a territory», observes Ilaria Tani, researcher at Bicocca and expert in maritime law. «Furthermore, coastal erosion is reducing the radius of protection that a nation can exercise: territorial waters are in fact measured at 12 miles from the low tide line along the coast, as is the zone of exclusive economic exploitation (up to 200 miles from the coast). Climate change is calling into question the stability of the legal order of the oceans».

In short, there are still many problems to be solved to defend the seas, while biodiversity continues to decline. «It is essential that the shortcomings described in this report,» concludes *Protected Planet*, «are not taken as a reason for despondency or loss of momentum for the future.»

Therefore, appointment to 2025, when the reconnaissance in the Maldives will be completed. «Hopefully», concludes Galli, «our model will also be exported to other areas of the world, as the heads of the UN Development Program have told us». 

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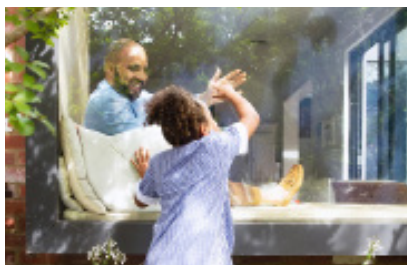
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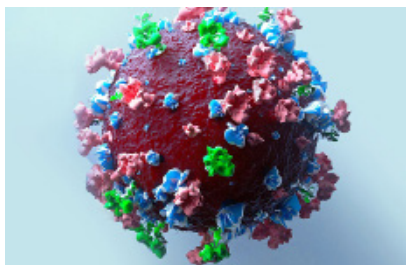


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