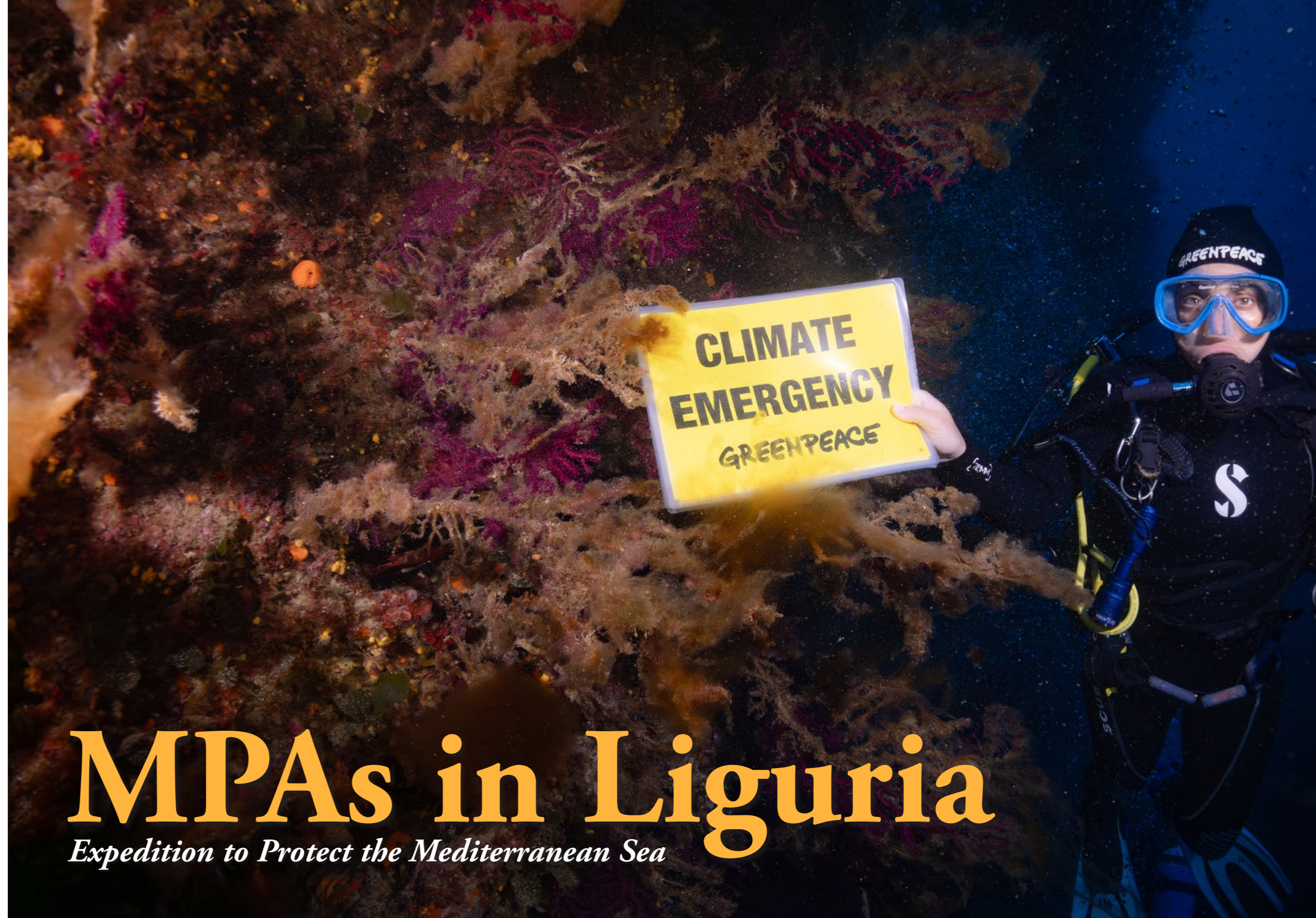


Red gorgonians in necrosis and covered with mucilage. This species is particularly sensitive to rising temperatures (right). Common octopus, painted comber and wrasse (below).

Text by Valentina Di Miccoli
Photos by Lorenzo Moscia

Climate change, ocean warming, impacts on marine biodiversity and the importance of marine protected areas (MPAs) prompted Greenpeace Italy to embark on an expedition to Liguria in late June 2024. Valentina Di Miccoli, a marine biologist on the expedition, tells the story.



MPAs in Liguria

Expedition to Protect the Mediterranean Sea

The mission to Liguria included several dives in various areas along the coast. We did not have many days, so we needed to stay focused, as there were many things to do, people to

meet and interviews to conduct. In Savona, I met up with Lorenzo Moscia, the photographer for the mission. He had been there for a few days documenting the biodiversity of Bergeggi

Island, an MPA established in 2007. Lorenzo told me he had seen lots of fish and other marine life, including corvinas, groupers, amberjacks, moray eels and octopuses. He then quickly

showed me a few photos. It was immediately clear from the pictures that the "reserve effect" was at work, thanks to protection and the mitigation of anthropogenic impacts, espe-





cially fishing. The fish were numerous, large and not particularly afraid.

There are 29 MPAs in Italy, covering less than one percent of the country's seas. These areas are small and lack adequate funding for proper management and monitoring, which requires experienced and trained staff. Nevertheless, they are the only tools we have today to protect biodiversity.

Gallinara Island

This was one of the main reasons why we undertook this mission. We began the expedition by heading to Alassio, where we met some researchers from the University of Genoa who were studying how the biodiversity around Gallinara Island has changed over the years. The area once had an extremely rich seabed, but it had never been

protected, despite a request for the establishment of a marine protected area in the past. The researchers wanted to sample the "benthos"—the species that live in close contact with the seabed—and compare the data with those collected many years earlier to understand how the lack of management measures has affected the health of the seabed.

Although Bergeggi Island and Gallinara Island are only a few kilometres apart, the difference



between the two is immediately apparent underwater. At Gallinara, there are far fewer fish, they are smaller, and marine litter is abundant on the seabed, especially fishing

Diver with Mediterranean cardinalfish and red gorgonians in necrosis (top left); Mediterranean moray (top right); Dusky grouper and gorgonians covered with marine mucilage (above); Atlantic lizardfish (centre)



Liguria



Diver and school of corvina, *Sciaena umbra*, also known as brown meagre (top left); Short-snouted seahorse (top right); Conger eel (left)

gear such as lines and nets.

This is the result of the promotion of the island's beauty over the past 20 years; ironically, the proposal for an MPA has attracted tourists and encouraged fishermen to fish unregulated in a biodiverse area. The failure to establish the MPA has prevented the enforcement of regulations that could have at least partially mitigated human activities, as is the case in Bergeggi and other Italian MPAs.

Shore diving

We said goodbye to Fulvia and Andrea, the dive staff who prepared delicious lunches for us on board the dive boat during our two days of diving, and headed for another beach where we hoped to encounter seahorses. This area is famous in Italy for sightings of these small, oddly shaped fish, but in recent years, they have suffered a dramatic decline, and it is becoming increasingly rare to find any resting on the seabed, camou-

flaged among the algae.

This time, the dive was from the shore, without a boat or dinghy. With our tanks on our backs, we headed to the pier, put our fins in the water and started a simple dive a few metres deep. Lorenzo, Greenpeace colleague Elisa Murgese and I swam parallel to the shore for about an hour before we spotted a small brown patch on the sandy seabed next to a clump of algae. The unmistakable tiny shape of a seahorse came into view. I was thrilled, as I had never seen one before.

The seahorse became our subject for nearly another hour. Fortunately, we were only a few meters deep, and there was plenty of air in our tanks. Shortly afterwards, we spotted another seahorse that was yellow and even more camouflaged than the first. Not far from the first, it had probably been there since we arrived, but its perfect camouflage had deceived us.



LORENZO MOSCIA
PHOTOGRAPHER
lorenzomoscia.com





Long-snouted seahorse (above and bottom left)



Short-snouted seahorse (above and top left)

The plight of the seahorses

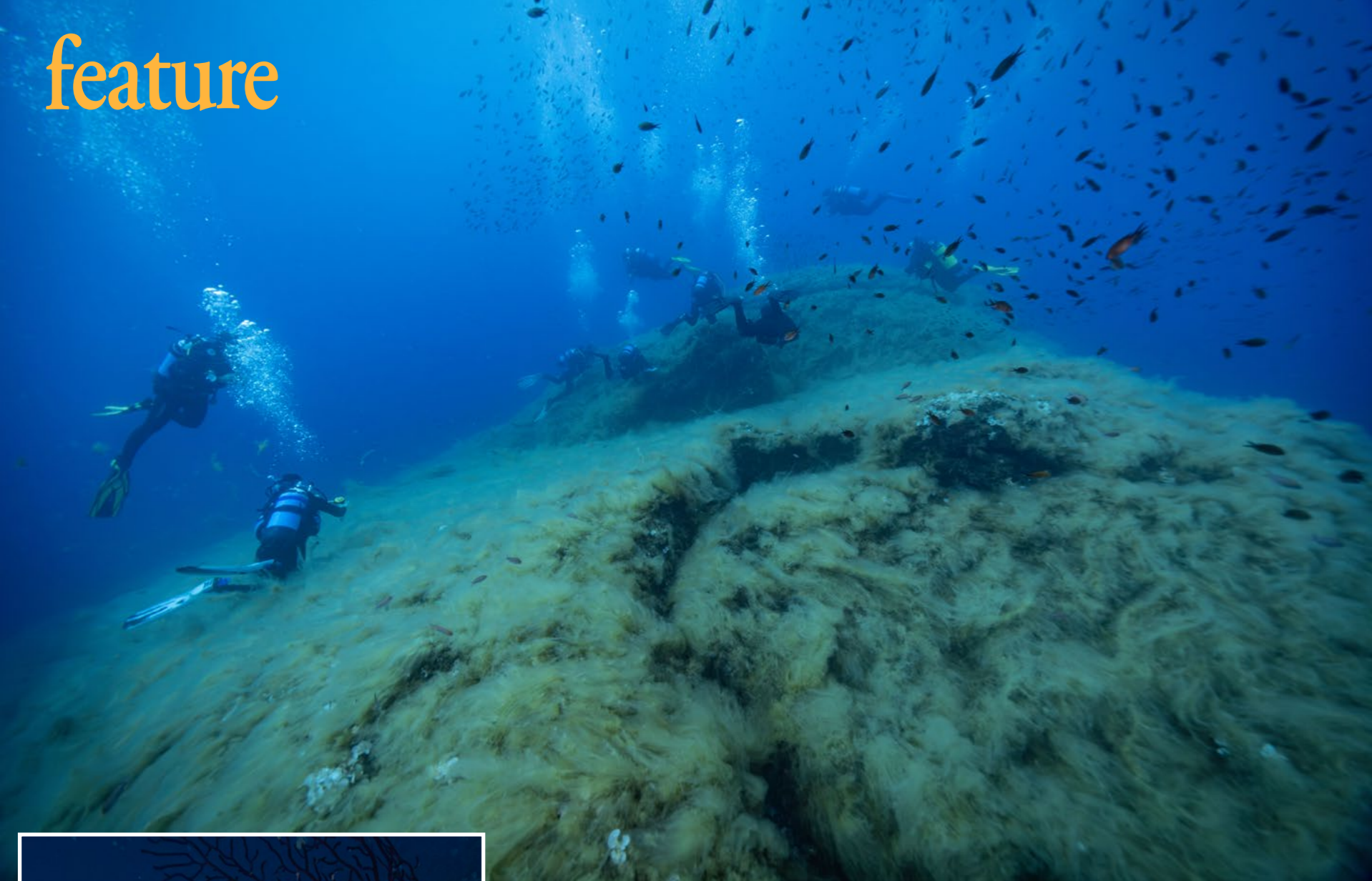
In the past, this area was home to numerous seahorses, so many that they attracted divers from many parts of Italy, as the director of the dive centre we relied on for this dive explained. We asked him what had happened over the years, and he told us that mass, unrestricted recreational diving had disturbed the seahorses for several consecutive summers. Some divers were handling and manipulating the animals, sometimes taking them out of the water and bringing them to shore. He concluded that all of this, combined with water pollution, had probably led to a decline in the seahorse population in the area.

We exited the water feeling very tired after nearly two hours

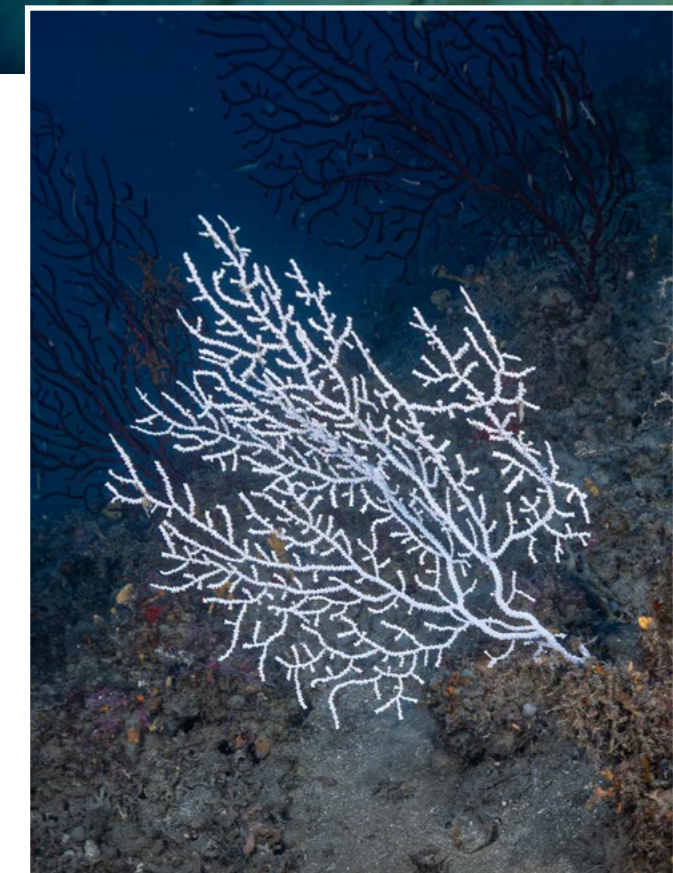
of diving. We managed to get some interesting shots, but just knowing that, in the past, we could have found several seahorses in just 10 minutes made us reflect once again on the importance of protecting marine biodiversity through the establishment of MPAs and stricter regulation of mass tourism.

Portofino MPA

It was day four, and we had one of the most important appointments of the whole expedition: diving at the Portofino MPA and interviewing Carlo Nike Bianchi, a professor and marine ecology researcher at the University of Genoa. He has been familiar with the Ligurian seabed for 40 years, so who better to tell us



Liguria



how it is changing? We met him at the dive centre, along with his wife, Carla Morri, who is also a researcher and marine biology expert. The researchers who have been collaborating with Greenpeace on the "Mare Caldo" project since 2019 were also present. This project monitors the impacts of the climate crisis on the marine biodiversity of reef communities across eleven MPAs along the Italian coast.

In Portofino, we needed to dive to monitor the health of the coralligenous habitat, in particular, the red gorgonians (*Paramuricea clavata*). Climate change is causing profound shifts in marine biodiversity, and gorgonians are among the organisms most sensitive to temperature fluctua-

tions. It is now not uncommon to find several individuals in a state of necrosis in shallower waters above 20m.

As we descended, we were immediately struck by the massive presence of mucilage, which completely covered the seabed and all organisms living in close contact with it, including the gorgonians. Large fish, such as groupers and snappers, were present, but to see the seabed without mucilage, we had to descend to 40m, where the gorgonians still seemed to be in good condition due to the cooler temperatures. One of the main factors that appeared to promote the microalgae responsible for the mucilage phenomenon was, indeed, the higher temperatures.



At 20m, the seabed was covered with marine mucilage (top left). Diver at wall with red gorgonians (*Paramuricea clavata*) covered with mucilage and some in a state of necrosis (top right). We had to go down to 40m to see red gorgonians not covered with mucilage (above). Pink sea fan, *Eunicella verrucosa* (left).





Red gorgonian covered with mucilage. Higher water temperatures promote the growth of microalgae that are responsible for mucilage.

Divers survey mucilage-covered reef (top left) with Mediterranean fairy basslets (*Anthias anthias*) and picarels (*Spicara smaris*). Red gorgonian and pink sea fan (top right).

Interview with Carlo Nike Bianchi

We returned to shore to interview Carlo Nike Bianchi. Sitting next to his wife on the small pier in Genoa where we had set off, he began to tell us about the importance of protecting the Mediterranean Sea. He said that the Mediterranean is considered a biodiversity hotspot; it represents only 1 percent of the world's seas and oceans, but it is home to 8 percent of the world's marine species, 20 percent of which are endemic and only found in

these waters. So began his interview, and he continued in a determined tone, explaining the importance of establishing well-managed MPAs. He cited the example of paper parks—protected areas that exist only on paper, where no conservation or management measures are implemented—and emphasised that, unfortunately, there are many such parks in the Mediterranean.

He told us that many areas in Liguria have changed over time, with a decrease in the variety of organisms leading to poorer seabeds with fewer

species present. He explained that fishermen are often among the first to oppose the establishment of MPAs, but once they see the positive effects, such as the repopulation of surrounding waters with large fish, they are often among the first to support their creation. He concluded by saying that the only viable solution at present to safeguard marine biodiversity is to create a network of MPAs so that they can be interconnected and collaborate on common policies.



Researcher Carlo Nike Bianchi



Researcher Carlo Nike Bianchi surveying a bed of seagrass in Liguria

Large colony of orange star coral, *Astroides calycularis* (top left); Diver on wall with Mediterranean fairy basslets, *Anthias anthias*, and Mediterranean red sea stars (above)

Conclusion

It is precisely for this reason that we will continue our studies in collaboration with MPAs, supporting them, amplifying their voices and urging the government to fund these initiatives and ratify the UN Global Ocean Treaty as soon as possible. This treaty aims to protect at least 30 percent of seas and oceans by 2030. ■

To learn more, please see:

Video of the mission by Lorenzo Moscia, including an interview with Carlo Nike Bianchi (with English subtitles)

Greenpeace International report on the importance of the 30x30 goal (protecting 30 percent of the ocean by 2030) in the UN Global Ocean Treaty (in English, French,

German, Spanish and Chinese)
Greenpeace Italy report on the actual protection of Italian seas (in Italian)

The latest **Mare Caldo report** by Greenpeace Italy (in Italian)

Thanks go to Sesto Continente Diving, Divenjoy dive centre, SubTribe dive centre and researchers from Genoa University, Monica Montefalcone and Annalisa Azzola.

Based in Rome, Valentina Di Miccoli is an Italian marine biologist and ocean campaigner for Greenpeace Italy. She has previously worked as a marine mammal observer and passive acoustic operator, as well as an environmental consultant on fishing vessels.

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