



WWF International Corals Initiative

Cold Water Corals

Geographic location: Worldwide

What is cold water coral?

Few people are aware of the fact, but corals are not just warm water creatures. There are also scores of corals in colder, deeper ocean waters. Like their tropical counterparts, they support a rich marine life and are in urgent need of protection.

Unlike in the equatorial seas, cold water corals don't need sunlight to survive. While their tropical counterparts rely mainly on microscopic algae in their tissues for sustenance, cold water corals feed by capturing food particles from the surrounding water. Cold water coral reefs are commonly found where current flow is accelerated, often around topographic highs such as seamounts, mounds, ridges and pinnacles and along the continental slope, at depths of 200 to 2000 meters, in water temperatures as low as 4° centigrade.

Some of the best studies of deep-sea coral reefs are from the Atlantic Ocean and North Sea around Europe, and the southern Pacific Ocean, but cold water reefs likely occur throughout the deep ocean where conditions are right. They have been studied in such diverse places as the Straits of Florida, the Galapagos Islands, and Antarctica.

Species

At depths where most animals would be starved of sunlight, deep-sea coral reefs are made up of only a few species. In the North East Atlantic, for example, the dominant species is *Lophelia pertusa*, which forms a complicated structure that provides a home for many other animals, including sea fans, sponges, worms, starfish, brittle stars, sea urchins, crustaceans and fish. Several animals bore into the coral skeleton causing it to fall apart. This provides new surfaces for coral colonization and enabling the reef to grow. *Lophelia* colonies can vary in size enormously from small thickets to giant coral

mounds, and range in color from orange to pink to white.

The number of invertebrate species on *Lophelia* reefs can be as high as that found in shallow-water tropical reefs, although the number of fish species recorded for individual sites tends to be closer to two or three dozen - compared to some 3,000 species on reefs in the tropical Indo-West Pacific region! *Lophelia* reefs, however, do attract fish aggregations and serve as an important spawning and nursery ground for some species. In addition, a wide variety of marine habitats are found around the reefs. The sea tends to be rich in wildlife, from sharks, seals, and cetaceans to commercially important fish stocks, as well as productive plankton and benthic communities.

Threats

Discovery of cold-water reefs may be a welcome surprise, but many of the structures have already been seriously damaged. As with tropical corals in shallower waters, a key threat is bottom-trawling fishing vessels. Off Norway, for example, 30 to 50% of the *Lophelia* reefs have been damaged or destroyed, most likely by trawling equipment. Off Australia, substantial destruction of reef-building coral, has been reported from southern Tasmanian Seamounts, again a result of trawl fisheries. The most heavily fished of these seamounts consists now of more than 90% bare rock where coral used to grow. This level of damage is all the more appalling since trawling at >1000 m depth started only recently.

Meanwhile, as shallow-water fish stocks are depleted and regulations limit the number of fish that can be caught, some fishermen turn to the exploitation of deep-water fish. As fisheries at these depths are only just beginning to be regulated, over-exploitation of stocks is a great danger. Offshore mineral mining is another potential threat to sensitive offshore habitats. Protection must be

in place to ensure that licensing decisions with respect to the fragile habitats take into consideration the short and long term impacts of mineral mining on deep sea reefs and fisheries biodiversity.

What WWF is doing

WWF has worked with scientists establish baseline information on these newly discovered ecosystems. With this information, WWF is lobbying governments to recognize the conservation value of cold water reefs and related habitats for protection under national and regional legislation, regional seas conventions and the international Law of the Sea.

In Europe, WWF is working under the EU Habitats Directive, to establish a network of Special Areas of Conservation through European Union territory. WWF published a report in 2001 entitled "Implementation of the European Habitats Directive offshore: Natura 2000 sites for reefs and submerged sandbanks", the first European inventory of all scientifically described reefs and sandbanks known at the date of compilation. Much more work needs to be undertaken, however, to implement the Habitats Directive offshore.

At the international level, there are hopes that 'High Seas Marine Protected Areas', sites outside national jurisdiction, may be declared and offered some protection. Hopefully, this will be achieved in such a way that fisheries can survive alongside natural, protected deep-sea habitats. It is clear that the legislation needs to be in place soon if we are to continue to learn and benefit from these magnificent, deep-sea coral gardens.

Case study: Darwin Mounds, United Kingdom

The Darwin Mounds are a unique, collection of sandy and cold-water coral mounds, discovered in 1998 yet under immediate threat of destruction. Lying at a depth of some 1,000 m about 185 km north-west of Scotland, the Mounds are an important centre of North Sea biodiversity, but one which has suffered much damage due to fishing activity.

The Darwin Mounds area has been fully mapped and the seabed extensively sampled and observed. There are hundreds of mounds, covering approximately 100 km², that support a substantial population of the deep-water coral *Lophelia pertusa*. The corals provide habitat for numerous species, which differ substantially from the surrounding seabed. Although the coral mounds are only a few meters wide, each mound can support hundreds of coral colonies. The dominant deep sea fish on and around the mounds are the cut-throat eel and the round-nosed grenadier. A number of suspension feeders such as sponges and brisingiid starfish use the corals as perches, while large echinuran worms use it as a refuge.

Recent studies of the Darwin Mounds area reveal direct evidence of the destructive impact of commercial deep sea trawling. High frequency sonar observations show seabed lineations and scars, some of which track directly through the mounds. Photographic observations have also revealed areas of smashed and fragmented coral in the mound field that may also correspond to the impact of trawling.

There is little doubt that the Darwin Mounds should be conserved under the EU Habitats Directive, yet government action to save them has been slow. The Darwin Mounds, highly fragile and vulnerable to physical disturbance, continue to be damaged at an alarming rate. WWF is working with the UK government to secure the protection for the Mounds. Once protection is achieved, WWF will continue to work in partnership with the government to achieve sustainable policy, management and long term financing for the Mounds.

Web sites for further reference:

www.ngo.grida.no/wwfneap/Projects/MPAmap.htm

www.ngo.grida.no/wwfneap/overview/overfset.htm

www.ices.dk/aboutus/pressrelease/coral.asp

www.soc.soton.ac.uk/GDD/DEEPSEAS/coralecosystems.html