Although coral reefs are normally associated with the tropics, they exist in cold water too. The Darwin Mounds, a deep-lying collection of hundreds of sand and cold water coral mounds north of Scotland, are an example. They were only discovered in 1998 and have already been damaged.

Where are the Darwin Mounds?
Part of an underwater landscape north of Scotland, the Darwin Mounds are situated in the north-east corner of the Rockall Trough immediately to the south of the Wyville Thomson Ridge. About 185 km north west of Cape Wrath, they are within the United Kingdom’s 200 nautical mile offshore waters. Their protection is therefore the responsibility of the UK government.

How big are the Darwin Mounds?
The Darwin Mound fields spread across approximately 100 km². There are hundreds of individual mounds that are typically circular in outline and up to 5 m high and 100 m across.

Why are they so precious?
Under current knowledge the Darwin Mounds are unique. They appear to be sand volcanoes and have unique tails, up to several hundred metres in length, downstream of the principal current direction. The tails are characterised by a very high
abundance of giant one-celled animals (protozoans), called xenophyophores. The single cells may grow to more than 20 cm and are often fragile. On the mounds themselves, substantial populations of the deep-water coral *Lophelia pertusa* are present in the form of colonies of a few to several metres wide. Deep sea fish such as the roundnose grenadier and the cut throat eel frequent the mounds. The mounds also provide shelter and habitat for many more animals including some species of sponges, starfish and echinuran worms. Thus, more species are present at the Darwin Mounds as compared to the surrounding seabed.

Specimens of the xenophyophore *Syringammina fragilissima* recovered in core samples from the Darwin Mounds area (Courtesy of DEEPSEAS Group, © Southampton Oceanography Centre).

**Darwin Mounds under threat**

There is evidence that the mounds have been impacted by fishing gear since their discovery in 1998. High frequency sonar observations of Darwin Mounds show seabed scars, some of which track directly through the mounds. Photographs have revealed areas of smashed and fragmented coral that are the direct result of trawling. The destruction coincides with observed fishing activity in the region by EU vessels registered outside the UK. It is of particular note that all but one of the deep-sea fish stocks such as the roundnose grenadier found in the vicinity of the Darwin Mounds have no current management system in place at all. Deep-sea fish live in a comparatively low energy environment, which is reflected in their slow rate of growth and reproduction. Sustainable exploitation rates will be very low. Scientists recommend a suite of management measures such as fishing licenses, closed areas and gear restrictions rather than catch quotas.

Offshore mineral mining is another potential threat to sensitive offshore habitats such as the Darwin Mounds. The 19th Round of Offshore Oil and Gas licensing announced earlier this year focused on the Atlantic Frontier to the north west of Scotland. It took a cautious route and avoided licensing any blocks in the vicinity of the Darwin Mounds. While it is currently unlikely, no protection is in place to ensure that a licensing decision for the sea areas including the Darwin Mounds is not approved in the future.

High frequency sidescan sonar images of Darwin Mounds. (a) An apparently ‘intact’ mound. (b) A mound that appears to have been disrupted by deep-water commercial trawling. (Courtesy of Dr Andrew Wheeler, University College, Cork, and Dr Doug Masson, Southampton Oceanography Centre, © University College, Cork).
Darwin Mounds conservation status

The Darwin Mounds comprise a unique underwater reef habitat that should qualified as an offshore Special Area of Conservation (SAC) under the European Union’s Habitats Directive.

Following a UK High Court decision in 1999, the British government is in the process of reviewing offshore habitats for identifying a network of marine SACs to comply with the Directive. Much work needs to be undertaken throughout Europe in order to conserve habitats and species offshore and the UK Government are at the forefront of identifying offshore SACs. While there is little doubt that the Darwin Mounds should be conserved under the Habitats Directive, no action has yet been taken to protect them.

What needs to be done to save the Darwin Mounds

The next steps in protecting the Darwin Mounds include designation of the Darwin Mounds SAC, drawing up a management plan for the site and implementing the management plan.

Successful long-term conservation of habitats such as the Darwin Mounds will include the management of fishing under the EU Common Fisheries Policy and managing the cumulative effects of oil and gas production and other activities under UK legislation. It is of note that while it is probably EU fishing trawlers registered outside the UK that have damaged the Darwin Mounds to date, action is required by the UK Government. The UK Government needs to identify the management action required for the Darwin Mounds and to make a proposal for management to the European Commission Directorate General for Fisheries (DG Fish).

WWF is one of the world's largest and most experienced independent conservation organizations with almost five million supporters and a global network active in more than 90 countries.

WWF's mission is to stop the degradation of the planet's natural environment and to build a future in which humans live in harmony with nature, by:
- conserving the world's biological diversity
- ensuring that the use of renewable natural resources is sustainable
- promoting the reduction of pollution and wasteful consumption.

© 2001 WWF North-East Atlantic Programme
http://www.wwfneap.org

Text by: Sarah Jones & Anthony Snape

This briefing was prepared by Sabine Christiansen & Silvia Hoffmann