The Josefine Bank - A Potential MPA

briefing

Location

The Josefine Bank is located at 36° 35' N, 14° 15' W in international waters, between the Exclusive Economic Zones of continental Portugal and Madeira (Portugal).

Potential Reasons for Selection

The Josefine Bank is a seamount in international waters that is not isolated but relatively close to the continental shelf and connected to other seamounts by its topography and location in the reach of Mediterranean outflow of water. Due to its patchwork of various hard and soft substrates, it probably serves as a stepping stone for the dispersal, via pelagic larvae, of a wide variety of benthic species from similar habitats on the continental shelf and other seamounts. The area is also important for fish species that live around topographic elevations including several commercially valuable species.

Seamounts

Seamounts are undersea mountains of volcanic origin, either isolated or as part of a chain of elevations, rising steeply at least 1000 m from the surrounding flat abyssal plain. Due to their size and shape, seamounts have complex effects on oceanic circulation, often leading to upwelling. This provides ample nutrients for the enhancement of primary and, depending on the retention time, higher trophic production compared to the surrounding waters. The most striking biological feature of seamounts is their richness in hard bottom suspension feeders which benefit from the enhanced currents transporting rich planktonic life: corals can be particularly abundant. with horny, stony and black corals being recorded where the currents are strongest, such as on vertical walls and on crests of seamounts with wide peaks. Further, sponges, hydroids, ascidians as well as crinoids, holothurians, shrimps a.o. occur and provide

The Josefine Bank - a Showcase Example for the OSPAR System of Marine Protected Areas

For information, contact:

Stephan Lutter

WWF North-East Atlantic Programme

Am Gütpohl 11 · D-28757 Bremen · Germany

Tel: +49 421 65846-22 · Fax: +49 421 65846-12

E-mail: lutter@wwfneap.org

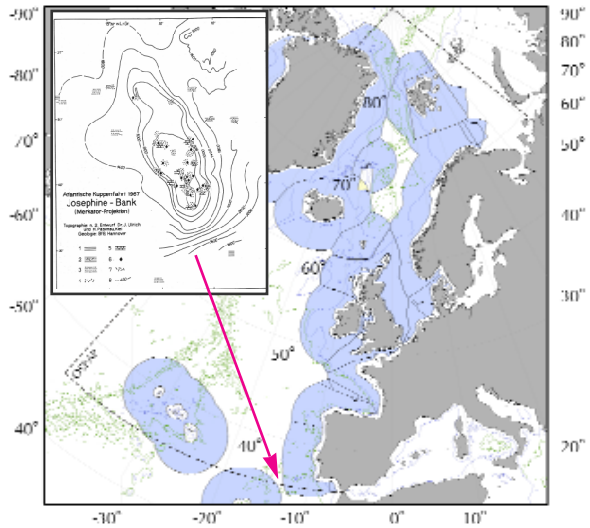

Fig. 1: Location of the Josefine Bank (detailed map indicates geological formations, from Closs et. al. 1969)

ample food and diverse habitats for fishes and other nekton to grow. Owing to this wealth, the density of large predatory fish near oceanic seamounts including swordfish, tuna, sharks and rays can be quite high, and aggregations of some otherwise dispersed species such as orange roughy (*Hoplostethus atlanticus)* often occur. Seamounts function as a stepping stone to transoceanic dispersal of species, and their degree of isolation is reflected in their richness in endemic species. The hard substrates on the tops and flanks of seamounts are made up of ancient hydrothermal precipitates, the so-called cobalt-rich ferromanganese crusts, rich in precious minerals such as cobalt, titanium, cerium, platinum, as well as manganese, copper and nickel.

Site Description*

The Josefine Bank is the westernmost extension of the east-west trending Horseshoe Seamount chain that also includes the Ormonds and Gorringe Banks. It rises from 2000-3700 m depth to within 170 m below the surface. The summit is almost flat with an area of 150 km^2 within the 400 m isobath. Towards the south, the seamount has very steep slopes down to depths between but to the NNW, the seamount extends into a northwards ridge. The summit is swept by currents, with finer sediments possibly frequently being reorganised, while biogenic and gravelly sand, limestone and basaltic rock characterise the substrates of the plateau and slopes. Water temperatures of 13-14° C and elevated salinity indicate the influence of Mediterranean outflow.

*** The Josefine Bank was subject to multidisciplinary investigations during the „Atlantische Kuppenfahrten" by R. V. Meteor in 1967. The knowledge gained with regard to the distribution of various taxa provides the background for this site description.**

Biological Features of Josefine Bank

The species-rich fauna of Josefine Bank is typical for east Atlantic islands and possibly other offshore banks and seamounts. The particularly well investigated summit region offers a wide variety of substrates which are readily populated by sometimes high densities of mostly sessile suspension feeding species. 16 species of horny and black corals, 13 species of stony corals, but no pennatulids and neither shelf nor deep sea benthic species have been recorded. The gorgonian coral *Ellisella flagellum* was found to be very common on both the Josefine and Great Meteor Seamounts but morphologically different between these sites which points to some degree of isolation. Dense beds of another gorgonian, *Callogorgia verticillata,* coincide with large sponges on the top of Josefine, quite different from other seamounts (Fig. 2). Sandy substrates are inhabited by the ascidian *Seriocarpa rhizoides*. The meroplanktic larvae of most of the 18 benthic decapod species do not occur over deep water and show few similarities to the shelf. Holozooplankton and euphausid populations are of oceanic origin, their densities modified by the bank. 26 species of benthopelagic fish have been determined from non-commercial trawls along the slopes and summit of Josefine, among these commercial species such as a long-lived rockfish (*Helicolenus dactylopterus),* the splendid perch (*Callanthias ruber*), a gamefish, and the longspine snipefish which is caught for aquaria.

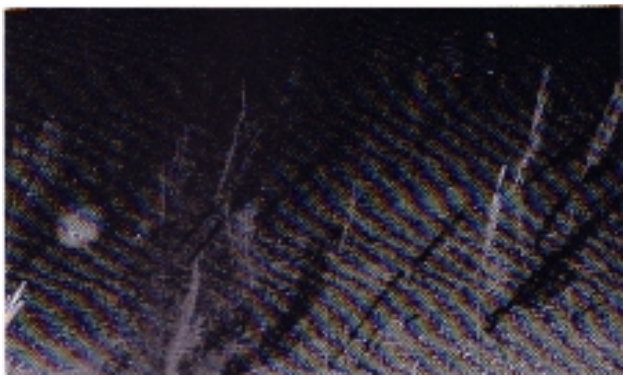

Fig. 2: Dense beds of horny corals, mostly *Callogorgia verticillata* on the top of Josefine Bank. (by A.L. Rice, in Gage & Tyler 1991)

Threats

The presence of commercially valuable species of deep-sea fish in this area (e.g. *Helicolenus dactylopterus*) implies that this area may have been targeted by commercial fisheries in recent years. It is unknown whether such fishing activities will have damaged the seamount ecosystem and this depends on the intensity of fishing and the type of fishing gear deployed. However, corals in general are long-lived and very vulnerable to physical impact. It is not known whether the black coral (*Anthipathes dichotoma*), a precious coral with very low resilience, is commercially harvested. A current-swept seamount such as Josefine, with exposed volcanic rocks may one day also be targeted for mining of its mineral-rich crust.

Management Considerations

The "freedom of the high seas" guaranteed by the UN Convention on the Law of the Sea (UNCLOS) has led to unregulated exploitation of the living resources which were thought to be shared by all nations. In the North-East Atlantic, despite advice from the International Council for the Exploration of the Sea (ICES) to the European Commisson and the North-East Atlantic Fisheries Council (NEAFC) to agree on a moratorium for deep water fishing until there is a scientific basis for stock assessments, both fora failed to implement adequate management measures. Lack of knowledge is typical for offshore features in general, and for possible alterations of the natural state at seamounts within reach of fisheries in particular. Here, the precautionary approach has to be applied in order to minimise and control future human impacts.

Legal Aspects

Josefine Bank is located in the High Seas sector of the OSPAR Maritime Area and no conservation measures have yet been applied outside national jurisdiction. However, the World Summit on Sustainable Development (WSSD) in 2002 called for action to maintain the productivity and biodiversity of important and vulnerable marine areas both within and beyond national jurisdiction. It urged nations to make significant progress within a concrete time frame, calling for adoption of the ecosystem approach by 2010 and the establishment of representative networks of MPAs by 2012. The resolution of the UN General Assembly A/57/L.48 endorses the Plan of Implementation adopted at WSSD and further calls for urgent and coordinated action to protect seamounts and other vulnerable benthic habitats.

Action Required

OSPAR is the regional seas agreement under which the commitment to implement a representative network of MPAs by 2010, including the High Seas, has been adopted. OSPAR has the opportunity to lead the global endeavours to protect vulnerable seamounts. The rapid increase in fishing pressure in the High Seas further emphasizes the need to get actively involved in developing measures to achieve enduring and sustainable conservation of seamounts and related features in the OSPAR Maritime Area.

Text prepared by Sabine Christiansen

References/Further Reading

NEAFC (2002): Management measures for the fisheries for deep-sea species agreed Press release. North East Atlantic Fisheries Commission, London. http://www.neafc.org/press%20release%204.doc

ICES (2002): Deep-Water Fisheries Resources South of 63°N - Overview. International Council for the Exploration of the Sea, Copenhagen. http://www.ices.dk/committe/acfm/comwork/report/2002/oct/o-3-13.pdf