MEDIA BRIEFING NOTES

SEAMOUNTS

A seamount is an underwater mountain, often of volcanic origin, defined as a steep geologic feature rising from the seafloor reaching a minimum height of 1,000 meters and with a limited extent across its summit.

The definition, however, is not strictly adhered to and any steep undersea mountain is often referred to as a seamount, regardless of its size.

Of those seamounts reaching more than 1,000 meters in height, it is estimated that there are:

- Between 30,000 and 50,000 in the Pacific Ocean
- Over 800 in the Atlantic Ocean
- An unknown number in the Indian Ocean.

Globally, it is estimated that the number of seamounts with a relief of more than 1000m is close to 100,000.

The best-known seamounts are found in the waters around Hawaii, Australia, New Zealand, Africa and the Philippines.

SEAMOUNT ECOSYSTEMS

Less than 0.2 percent of the world's seamounts have been explored to learn what species live on them, but many of the species which have been found were previously undiscovered.

Significant findings from the past few years include:

- an estimated 10 million species live in the deep sea, most of them still undiscovered;
- approximately 98 percent of the oceans' species live in, on or just above the floor of the sea;
- seamounts are home to a high number of species (e.g., over 850 species were recently found on seamounts in the Tasman and Coral Seas; more than 2000 were found on seamounts off New Caledonia in the Pacific Ocean);
- two-thirds of all known coral species live in waters that are deep, dark, and cold – some live three miles deep and are able to survive in 30°F;

- some cold-water coral reefs are 5,000-8,500 years old or more, and some grow into beautiful structures that rise up to 35 meters high;
- deep-sea corals, sponges and other habitat-forming organisms provide protection from currents and predators, nurseries for young fish, and feeding, breeding, and spawning areas for hundreds of thousands of species;
- because deep-sea species live in rarely disturbed environments and tend to be slow growing and late maturing, they are exceptionally vulnerable to extinction;
- deep-sea coral and sponge communities are largely untapped sources of natural products with enormous potential as pharmaceuticals, enzymes, pesticides, cosmetics, and other commercial products; for example:
    - Gorgonian corals produce antibiotics;
    - compounds found in certain deep-sea sponges are potent immunosuppressive and anti-cancer agents;
    - some coral species contain the pain-killing compounds known as pseudopterosians;
    - seafans contain high concentrations of prostaglandins, compounds used to treat asthma and heart disease;
- ancient deep-sea corals provide valuable records of climate conditions that may assist our understanding of global climate change.

Studies in the Southwest Pacific suggest that up to one third of the species found around any one seamount are endemic ie. unique to the immediate habitat. An endemism rate for the following areas has been identified:

- Tasmania 35%
- Norfolk seamounts (New Caledonia): 36%
- Lord Howe Island seamounts (New Caledonia): 31%
- Sasca and Sala-y-Gomez seamounts (Chile): 44% for fish and 52% for invertebrates
- Hawaiian and Emperor seamounts: 17% for fish
- Great Meteor seamount: 9% for fish

A more detailed study of the Tasman Seamounts suggested that the levels of endemism among 850 macro and mega-faunal species could be as high 29-34%.

Studies in the Tasman and New Caledonia Seamounts have shown a relatively low overlap between the species of different, neighboring seamounts and suggests that in ecological terms, they function as island groups or chains with localized species and unique specifications between each group or chain. In some cases, these animals represent living fossils and seamounts may act as "refugia" sheltering deep-sea animals when other parts of the deep sea are disrupted by natural climatic change and environmental catastrophe. For each seamount ecosystem destroyed, therefore, unique species may become extinct.

SEAMOUNTS AND COMMERCIAL FISH

Seamounts create complex patterns of ocean currents that influence the sea life above and around them and attract commercially valuable fish species.

In addition to species, such as orange roughy, which form spawning groups over seamounts, non-seamount species such as the Japanese eel also gather over seamounts for reproduction.

Species which live around seamounts are sometimes exceptionally long-lived, slow growing and slow to mature.

Orange roughy can live to 150 years old, mature at 20-30 years of age and produce relatively few large eggs.

Some rockfish and some oreos can live for more than 100 years, while the Icelandic roundnose grenadier live well into their 70s, maturing at around 14-16 years of age.

Developments in technology have made the deep oceans commercially viable for fishing and it is estimated that some 40% of the world's trawling grounds now lie in these areas. Since 1964, deep-water fisheries have contributed an annual catch of between 0.8 - 1.0 million tonnes of marine fish.

BOTTOM TRAWL FISHING

Advances in bottom trawl technology – more powerful engines, bigger nets, more precise mapping, more advanced navigational and fish-finding electronics - have enabled fishing vessels to drag fishing gear across the ocean bottom as much as two kilometers (1.2. miles) deep.

Bottom trawling is now the preferred method for fishing the ocean bottom on the high seas, accounting for approximately 80% of the total high seas bottom fisheries catch in 2001.

Huge nets armed with multi-ton steel plates and rollers are dragged across the seabed, plowing up and pulverizing all in their path.

The mouth of the trawl net is held open by two steel plate doors that help to keep the net on the seafloor.

One company markets what it calls “Canyonbusters”, trawl doors that weigh up to five tons each. To protect the net from snagging on rugged seafloors, heavy chafing gear is attached to the bottom of the trawl net. A heavy cable is also strung through steel balls or rubber bobbins – known as “roller gear” or “rockhoppers” – that can measure a meter or more in diameter.

Pelagic armorhead has been exploited over seamounts in the central North Pacific since the late 1960s.

Orange roughy has been exploited over a variety of seamounts and marine plateaux since the early 1980s where initial catches could exceed 60 tonnes from a single 20 minute trawl.

Targeted fish stocks are showing signs of overexploitation within a short period of time in the following locations:

- Orange roughy fisheries in the waters off New Zealand, Australia, Namibia, and the North Atlantic
- The pelagic armorhead fishery over seamounts in international waters off Hawaii
- The blue ling fishery in the North Atlantic
- Alfonsino and roundnose grenadier fisheries in the Mid-Atlantic Ridge
- The giant redfish fishery in international waters close to Iceland

It is estimated that the orange roughy population has been fished down to $1/6^{th}$ of its original virgin biomass.

A comparison of fished and unfished seamount areas showed that fishing has reduced benthic biomass by 83 % and the number of species by 59 %. More than 90% of coral reefs can be removed from seamounts subject to trawling.

In 1994, four distinct spawning aggregations of orange roughy were discovered off the coast of Namibia and only five vessels entered the fishery in 1997. The stock was overexploited in just 6 years and is now at only 25% of its original biomass.

Fishing of the pelagic armorhead over the Southern Emperor Seamounts and seamounts in the northern Hawaiian Ridge drove the stock to commercial extinction within 10 years of their discovery. The stocks have never recovered.

Newly discovered stocks of orange roughy on seamounts off New Zealand and Australia are typically fished down to 15-30% of their initial biomass within 5-10 years.

Orange roughy landings have been sustained through the serial depletion of stocks between Southeastern Australia and New Zealand. Typically, newly discovered stocks were fished down to 15-30% of the initial biomass in only 5-10 years. Catch and effort data show very strong declines in catch rates over time. This is known as “gold-mine” fishing.

Studies of the fished populations in New Zealand have revealed that male orange roughy now show a reduced size at maturity, and possibly also reduced genetic diversity, although the evidence for these changes is conflicting.

The International Council for the Exploration of the Sea (ICES) reports that most exploited deep-water species are considered to be fished “outside safe biological limits.”

BYCATCH

In the seas around New Zealand and Tasmania, the coral bycatch for orange roughy fisheries is substantial with between 1- 15 tonnes of coral bycatch being recorded per trawl.

In one year, it is estimated that the tonnage of coral bycatch in the Tasman Rise fishery was greater than the tonnage of oreo species (the second most valuable commercial species after orange roughy).

It has been found that heavily fished seamounts off Tasmania have virtually no coral cover, in marked contrast to unfished or lightly fished seamounts.

Bare rock characterizes 95% of the seafloor in trawled areas, as opposed to only 10% on the most comparable undisturbed areas surveyed.

The high degree of endemism of the fauna associated with these habitats renders the possibility of extinctions extremely high, though such extinctions are likely to remain undetected.

TRAWL FLEETS

Eleven countries are responsible for 95% of high seas bottom trawling: **Spain, Portugal, Russia, Lithuania, Latvia, Estonia, Iceland, Norway, Faroe Is (Denmark), New Zealand, and Japan**.

High seas bottom trawl fisheries catch 170,000-215,000 mt annually, which is about 0.2% of world marine fish catch. This catch is valued at $300-400 million USD in 2001, and was less than 0.5% of total value of world fish landings.

Northeast Atlantic:

In the Northeast Atlantic Ocean, the primary targeted species are roundnose grenadier, blue ling, smoothheads, Greenland halibut, orange roughy and deep-water sharks.

- **Spain** appears to be taking half or more of the high seas bottom trawl catch with **Russia**, **Lithuania**, and **Estonia** catching most of the rest.

- Vessels from **Ireland** have been rapidly developing deep-water fisheries for a number of species, primarily within the EEZ, and may be involved in high seas fishing.

- A vessel or vessels from **New Zealand** were fishing for orange roughy on the high seas in the region in 2001.

It is estimated that high seas bottom trawl catch in this region in 2001 was 25,000-55,000 metric tons, worth $35-75 million USD in landed value. One-fourth or less of the entire catch of deep-water species in the region was taken in the high seas, with the remainder caught within the EEZs.

The high seas bottom trawl fishery accounted for approximately 0.2-0.5 percent of total catch of all types of fish by all gears in the region.

Northwest Atlantic:

In the Northwest Atlantic Ocean, the primary targeted species are Northern prawn, Greenland halibut, redfish, and skates.

- **Norway**, **The Faroes**, **Iceland**, **Latvia**, **Lithuania**, **Russia**, **Spain, Portugal** and **Estonia** are the main countries involved in high-seas deep-water bottom trawling in the Northwest Atlantic.

Spain, Russia, Portugal and Estonia caught most of the groundfish, amounting to about 65,000 mt in 2001.

Approximately 90% of the high seas catch of northern prawns was taken on the Flemish Cap, a fishery which began in 1993 after the collapse of cod and other groundfish fisheries.

These eight countries took over 95% of the total high seas catch of 60,000 mt of northern prawns in 2001, valued at approximately $90 million USD.

It is estimated that high seas bottom trawl catch in this region in 2001 for all species was 125,000 mt, valued at approximately $215 million USD. This accounts for approximately 6% of the total marine catch in the region.

Southwest Indian Ocean:
The Southwest Indian Ocean high seas bottom trawlers target orange roughy and alfonsinos.

- **New Zealand, Japan** and **Australia** took the majority of catch. The Japanese were reported to have left the region in early 2002 because of the uneconomical nature of the fishery.

- Five vessels were reportedly bottom trawl fishing on the high seas in 1999; by 2000, up to 40 vessels may have been involved. This dwindled to roughly six vessels in 2002 because the fishery catch had severely declined and the catches were no longer economically viable.

It is estimated that high seas bottom trawl catch in this region for 2001 was 7.962 mt, or 0.2% of total marine catch in the region.

Southwest Pacific Ocean:
The Southwest Pacific Ocean has significant fishing for orange roughy.

- **New Zealand** and **Australian** vessels were most active, catching roughly 3,900 mt of orange Roughy in 2001.

- An additional 200 mt of orange roughy was caught by distant water fishing nations.

- Several thousand tones of alfonsino were caught by New Zealand, but it is unknown how much of this came from their EEZ or from the high seas of the region.

The high seas catch of orange roughy and several hundred mt of oreos would put the value of the catch in 2001 at approximately $10 million USD, representing about 0.6% of total marine catch in the region.

It appears that high seas bottom trawl fisheries may be emerging off the Namibian EEZ in the Southeast Atlantic for orange roughy, alfonsinos, cardinal fish, and oreos. A considerable amount of exploratory fishing for deep-sea species is taking place on the high seas.

Incentives to fish include: growing market demand for fish products in developed countries, which are the primary markets for deep-sea caught species, and increasing regulation, depletion and/or restrictions on fisheries in EEZs.

It is estimated that the number of bottom trawl vessels working annually on the high seas the equivalent of full time is not likely to be more than 250-300. The high seas bottom trawl fleet is likely to constitute only about 0.01% of the world's fishing fleets.

PROTECTION

- 14 seamounts are closed to commercial bottom trawling off Tasmania, Australia, covering a total area of some 370 square kilometers, or 20% of the total seamounts in the area.

- New Zealand has closed 19 seamounts to all fishing, but this is only 2% of their total seamounts.

- 64% of the world's oceans are outside the EEZ of all countries, making it necessary to have international agreements to protect seamounts.

Over the past two years, the UNGA has issued Oceans and Law of the Sea resolutions calling on the international community to take urgent measures to manage the risks to vulnerable deep-sea ecosystems. Its 2003 resolution urged relevant global and regional organizations "*to investigate urgently how to better address, on a scientific basis, including the application of precaution, the threats and risks to vulnerable and threatened marine ecosystems and biodiversity in areas beyond national jurisdiction.…*"

In February 2004, the Conference of the Parties of the Convention on Biological Diversity urged UNGA to stop destructive practices harming deep-sea ecosystems. Referring to marine areas beyond the limits of national jurisdiction that have seamounts, hydrothermal vents, cold-water corals and other vulnerable ecosystems and features, the Parties called on the UNGA to:

> *urgently take the necessary short-term, medium-term and long-term measures to eliminate/avoid destructive practices, consistent with international law, on a scientific basis, including the application of precaution, for example, on a case by case basis, interim prohibition of destructive practices adversely impacting the marine biological diversity associated with the areas….*

In 2003 governments responded by saying that urgent action was required but that it was the role of the UN to formulate and manage any such measures.

In February 2004, 1,136 scientists from 69 countries released a statement expressing profound concern:

> "that human activities, particularly bottom trawling, are causing unprecedented damage to the deep-sea[1] coral and sponge communities on continental plateaus and slopes, and on seamounts and mid-ocean ridges." The statement called on governments and the United Nations to establish a moratorium on high seas bottom trawling. (For a full text of the statement, see www.mcbi.org).

The regional fishery management organizations (RFMOs) with competence to regulate high seas bottom fisheries in their regions currently are:

- Northwest Atlantic Fisheries Organization (NAFO)
- Northeast Atlantic Fisheries Commission (NEAFC)
- Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR)
- Southeast Atlantic Fisheries Organization (SEAFO)

The 1995 UN Fish Stocks Agreement is an implementing agreement for the UN Convention on the Law of the Sea (UNCLOS), which obligates States to assess the impact of fishing on non-target species and species belonging to the same ecosystem, minimize the impact of fishing on non-target species, protect habitats of special concern, and protect biodiversity in the marine environment.

In the North Atlantic, it appears that many, if not most, of the stocks fished by bottom trawlers on the high seas are straddling fish stocks covered by this agreement.

Countries with continental margins extending beyond 200 nautical miles have the sovereign right to explore and exploit sedentary seabed resources such as corals, scallops and crabs.

Most countries, particularly less developed ones, have not performed coastal mapping sufficient to understand the scope of these rights. As a result, many nations not only stand to have stocks straddling their Exclusive Economic Zones (EEZs) diminished or depleted, but may also be losing deep-sea corals and other vulnerable and potentially valuable species along their continental margins as a result of destructive bottom trawling by distant water fleets fishing on the high seas.

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[1] The deep sea starts beyond the shallower continental shelf and includes the slope and rise of the continental margin, deep-ocean basins and plains, trenches, mid-ocean ridge systems, smaller ridge systems, seamounts, plateaus and other underwater features rising from the deep ocean floor. This area constitutes over 90% of the ocean bottom and mostly lies beyond 200 nautical miles from shore.

An analysis of current fishing areas and exploratory fishing trends commissioned by DSCC member organizations indicates that there are a number of coastal "wide margin" states likely to be most vulnerable to bottom trawl fishing on the high seas. These include:

- Angola
- Argentina
- Brazil
- Canada
- Iceland
- India
- Mauritius
- Mozambique
- Namibia
- New Zealand
- Norway
- Seychelles
- South Africa
- and a number of EU countries.

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