

**Charlie-Gibbs Fracture Zone -
Experience on the identification of an OSPAR MPA in Areas Beyond National Jurisdiction and
application of the CBD 'EBSA' criteria for identifying ecologically or biologically significant
marine areas in need of protection (CBD COP IX Resolution IX/20) to the area**

1. Background

Location

The draft Charlie Gibbs MPA (as agreed by OSPAR 2008¹) covers the northern part of the Mid-Atlantic Ridge (MAR) between 55° N and 49° N, including the Charlie-Gibbs Fracture Zone (Fig. 1). The proposed boundaries reflect the scientific agreement reached at OSPAR ICG MPA in April 2008, acknowledging that the enclosed area will fully incorporate representative sections of the MAR north and south of the Charlie-Gibbs Fracture Zone, adjacent abyssal plain and the meandering subpolar front which separates cool northern from warmer southern waters and sustains a relatively high abundance and biomass across the foodweb. The boundaries include also a variety of seamount communities of different types and depths, including Faraday and Hecate Seamount, as well as a section of the Reykjanes Ridge where bottom trawling and fishing with static gear, including bottom set gillnets and longlines, has been prohibited since 2004 (NEAFC Recommendation VII, 2008). Since April 2009, all of the ridge area inside the proposed MPA boundaries has been closed to fishing with bottom contracting gear by NEAFC².

OSPAR MPA network

Transposing the global commitments made under CBD into regional action, OSPAR environmental ministers decided to establish a OSPAR network of ecologically coherent and well-managed MPAs by 2010 (OSPAR Recommendation 2003/3³). OSPAR MPAs individually and collectively aim to „protect, conserve and restore species, habitats and ecological processes which are adversely affected as a result of human activities“, „prevent degradation of and damage to species, habitats and ecological processes following the precautionary principle“ and „protect and conserve areas that best represent the range of species, habitats and ecological processes in the OSPAR area.“ (OSPAR 2003-17).

The recommendation explicitly covers all of the OSPAR maritime area, including waters beyond national jurisdiction (ABNJ). NGOs were enabled to independently submit proposals for MPAs in ABNJ.

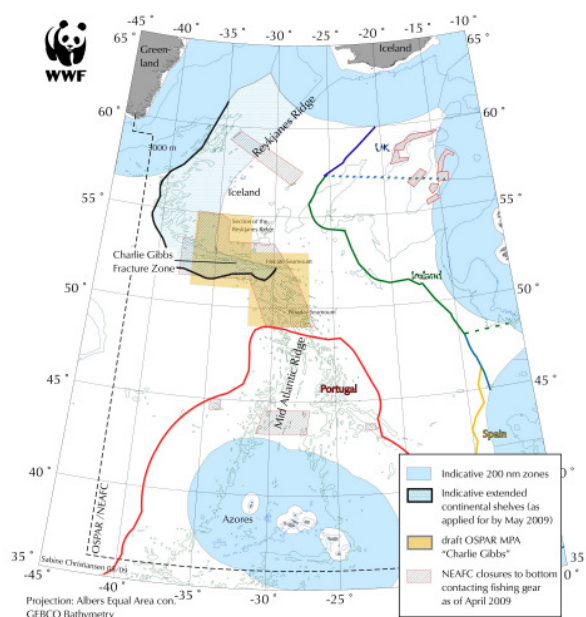


Fig. 1: Location of the proposed Charlie Gibbs MPA on the Mid-Atlantic Ridge (yellow) and current NEAFC fisheries closures (grey shade). Coastal states' 200 nm zones/EEZs are shown in light blue, the boundaries of extended continental shelves as applied for by May 2009 as colored line.

¹ OSPAR 08/24/1-E

² http://www.neafc.org/system/files/vmes_press_rel_april2009.pdf

³ OSPAR Recommendation 2003/3 on a Network of Marine Protected Areas (OSPAR 03/17/1-E, Annex 9), see www.ospar.org

2. The elaboration process for the Charlie Gibbs MPA

Charlie Gibbs was the last of a series of five showcase proposals for marine protected areas beyond national jurisdiction in the OSPAR area elaborated by WWF between 2000 and 2006⁴. The other sites proposed, namely part of the Rockall Bank, Josefine Bank, the BIOTRANS research area on the West European Basin abyssal plain and the hydrothermal vent Rainbow, all lie in international waters, but with the seabed potentially falling onto the extended continental shelves of coastal states.

Therefore, one of the motivations for the selection of the Charlie Gibbs Fracture Zone area on the Mid Atlantic Ridge was to find a representative and biologically highly interesting area likely to fulfill the OSPAR site selection criteria⁵ fully beyond national jurisdiction. Such a pilot MPA should be instrumental to testing and developing further the selection process and all related OSPAR procedures as well as international governance and management issues.

All actions taken by OSPAR until April 2009 have presumed that the area would not touch the extended continental shelf of a coastal state. However, recently Iceland applied for its extended continental shelf boundaries to be recognized, based on Art. 76 UNCLOS, as far south as 51.4° N, overlapping the northern part of the proposed MPA (see Fig. 1).

Based on the OSPAR proforma for MPAs⁵, the first submission of WWF's Charlie Gibbs MPA proposal to the working levels of OSPAR was elaborated in fall 2006. This first proposal was solely based on the scientific literature published at that date, as well as the pre-publications to the media by the Census of Marine Life project MAR-ECO (Patterns and Processes of the ecosystems of the northern mid-Atlantic⁶) from its first research expedition to the area in 2004. The MAR-ECO investigations covered the distribution and abundance of zooplankton, benthos, fish communities, as well as marine mammals and seabirds in several focal areas along the Mid Atlantic Ridge, including the Charlie Gibbs Fracture Zone. These new results, together with the literature and data compilation initiated by the project boosted the knowledge base for this remote area, previously known mainly for the deepwater fishing activity taking place there since the 1970s (Clark *et al.* 2007).

After the presentation of the first WWF Charlie Gibbs MPA proposal in 2006, support was sought from Contracting Parties, and by the next meeting in 2007, the Netherlands had decided to not only formally co-sponsor the proposal but also to make available for one year a full position to foster the subject. This move generated the support of the OSPAR MPA working group to request advice from ICES and a group of independent deepsea scientists on the substance of the revised 2007 MPA proposal by January 2008. Also in January 2008, the special volume compiling the results of the MARECO scientific expedition was published (Bergstad *et al.* 2008 and related publications), which had not been available to WWF pre-print.

ICES checked whether the justifications for the area proposed met the OSPAR selection criteria and requested that the new knowledge from the MAR-ECO project be included in the site proposal. Therefore, WWF made a major revision of the proposal with all new knowledge included, which substantially broadened the basis for the selection of the area. This revised proposal was subject to review by contracting parties and scientists in April 2008 (OSPAR ICG MPA) where it was concluded that it provided a sound scientific case for proposing the site to be included in the OSPAR network of MPAs. In a parallel process, approximately the same area had been proposed in a Germany-commissioned study by Roberts *et al.*, University of York. Therefore, a merged MPA proposal was written to be presented to the OSPAR Commission meeting in June 2008. OSPAR 2008 considered the proposal, now supported by France, The Netherlands and Portugal, and agreed that:

- a. a comprehensive scientific case had been established for the CGFZ as a potential OSPAR MPA;
- b. collectively Contracting Parties had expressed substantial political support for further work on the CGFZ proposal;
- c. the CGFZ is approved in principle as a potential MPA in areas beyond national jurisdiction (ABNJ) as a component of the OSPAR network of MPAs, encompassing the seabed and the superjacent water column;

OSPAR 2008 also agreed a 'road map' with a view to considering the possible adoption of the CGFZ -MPA at the OSPAR Ministerial Meeting in 2010.

⁴ all site descriptions and additional information can be found at <http://www.ngo.grida.no/wwfneap/Projects/MPA.htm> (Promoting a Network of Marine Protected Areas Promoting a Network of Marine Protected Areas), see also http://www.ngo.grida.no/wwfneap/Projects/Reports/WWF_NEA_HSMPA_Proposals.pdf (Marine Protected Areas in Areas Beyond National Jurisdiction. Proposed High Seas MPAs in the North-East Atlantic (1998-2006))

⁵ Guidelines for the Identification and Selection of Marine Protected Areas in the OSPAR Maritime Area (Reference number: 2003-17), see www.ospar.org

⁶ see <http://www.mar-eco.no>

3. OSPAR MPA selection process

Other than the CBD EBSA criteria, the OSPAR criteria for identifying sites to be included in the OSPAR network of ecologically coherent and well-managed MPAs include representativity among the ecological criteria/considerations to be used in the first stage of site identification. To meet the aims of the OSPAR MPA network representivity of natural characteristics is an important aspect in site selection (OSPAR 2006-3⁷).

The table in Annex 1 associates the ecological qualities of the Charlie Gibbs area with the criteria established by OSPAR, CBD (EBSAs acc. COP 9 Decision IX/20 Annex I), and FAO (for vulnerable marine ecosystems, FAO 2009). It is obvious that the Charlie Gibbs site proposal can satisfy all of the ecological criteria set. However, this is strongly dependant on the scale of the analysis. The site nomination covers approx. 300000 km², a tiny fraction of this area being visited recently by one multidisciplinary scientific expedition only, with very few other data available. Also historic landings of deepwater fish from the area are primarily available only as unreviewed grey literature.

This shows that even in this relatively well documented and researched case, data constraints may not be posed too high.

4. Views on data requirements

It is almost inevitable, that conflicting opinions will be heard on the requirements on data/literature quality and quantity available. In the case of the Charlie Gibbs area, despite some support also, resistance to nomination of the area based on the available scientific evidence came primarily from scientists, arguing for more science to be done before designation of the area. The government experts in the OSPAR fora on the other hand were much more willing to accept data limitations and apply the precautionary approach, as signed up for in CBD. Their basic request was to have a scientifically correct and complete site description of a proposed MPA which appeared to be a relevant case for protection measures.

It can safely be assumed that the data quality and quantity available to justify potential MPAs in ABNJ can always be questioned, with the possible exception of small hydrothermal vent fields. The degree of scientific knowledge and understanding exponentially decreases with increasing distance from the coast and costs are exploding. Therefore, it is also not likely that the knowledge base will significantly increase in the near future.

Vice versa, the nomination and designation of MPAs has to be seen as a chance to raise funds for more research and eventually monitoring. Therefore, rather than making a firm knowledge base the prerequisite for site selection, the accumulation of knowledge on particular sites should be seen as an iterative process.

5. Effectiveness of the elaboration process

The WWF MPA proposals were meant to be showcases of different types of ecosystems in the North East Atlantic being in need of spatial measures, and as such were not elaborated in a systematic way based on a regional biodiversity classification system.

The hotspot approach is usually based on a pre-judgement of a likely conservation interest, or concrete scientific knowledge of a site. Once a particular region of the ocean is considered for hosting a candidate MPA area, the compilation of published literature and the establishment of contacts with scientists working in the area is a straight forward process which is not very time consuming. It may be most effective to commission the site description and data compilation to a (policy-experienced) scientist, where possible, to tap immediately the most recent research results. OSPAR is usually requesting ICES to comment on the scientific basis for MPAs proposed in ABNJ. However, the community of biological scientists working in offshore pelagic and deep waters is very small, and it should be possible to establish a global scientific advisory board for such questions.

⁷ Guidance on developing an ecologically coherent network of OSPAR marine protected areas (Reference number 2006-3), see www.ospar.org

6. Lessons learned

- The CBD EBSA criteria, like the OSPAR MPA criteria, can probably be applied to any site where some level of knowledge exists. The criteria are very broad, and rather serve the identification of the site than being instrumental to prioritising sites. As data availability and coverage will be very different for different sites, expert judgement will still be required for selection.
- Both sets of criteria lack the dimension of threat from human activities, as inherent in the UNGA/FAO vulnerable marine ecosystem approach (VME). This should be added as a prioritization criterion where MPAs are an adequate measure.
- Concrete site proposals help to make progress with previously unprecedented governance and management cases such as MPA identification in waters beyond national jurisdiction
- Early involvement of relevant scientists and scientific organisations can shorten the nomination process. However, scientists have a different agenda and priorities and tools should be developed to make such cooperation profitable for both sides (e.g. credit points for research grants).
- For NGOs it is paramount to seek support, if possible active engagement, from coastal states governments early on in the process
- Particularly for pilot cases in a given region, the availability of scientific data and the ability to show threats is crucial. Recent scientific observations add weight to the proposal, historic comparisons even more. The level of information necessary might be lower in subsequent cases and further when applying network approaches.
- Rather than prioritizing low-conflict sites, an acute threat from human activities subject to regulation increases the urgency for action
- The spatial scale of proposed MPAs in ABNJ, and the temporal scale of deep sea ecosystem processes is unlikely to be ever matched by adequate data coverage, and the precautionary approach needs to be implemented. Therefore,
- Gaps in data coverage should not be an issue of primary concern in the first selection stage for network of Marine Protected Areas in ABNJ. Rather, sites of interest qualifying under the CBD EBSA and network criteria (COP 9 Decision IX/20 Annex I and II) should be used for designing a global map of sites of interest, typified into different ecological groups of sites and allocated to the biogeographic realms elaborated and published in the 'GOODS report' (UNESCO, 2009).
- In the absence of sufficient scientific data, MPAs should be selected for the global network based on representativity and likelihood for occurrence of vulnerable marine ecosystems (*sensu* UNGA 61/105 and FAO guidelines), rather than waiting for scientific evidence to accumulate. This is more cost-effective in the short- and longterm.
- Designation of cross-regional transects could be an option for ensuring ecological coherence and representation.

7. References

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Annex 1: Application of the OSPAR, CBD EBSA and UN /FAO criteria to the Charlie Gibbs Fracture Zone (please note: this comparison will be submitted similarly by OSPAR)

OSPAR MPA network criteria <input type="checkbox"/> (OSPAR 2003-17)	CBD EBSA criteria <input type="checkbox"/> (COP 9 Decision IX/20 Annex I)	UN / FAO criteria of VMEs <input type="checkbox"/> (FAO 2009)	Qualifications of the proposed Charlie Gibbs MPA (see OSPAR 08/7/9-E, BDC 09/5/8-E and BDC 09/11/1-E, Annex 9)
	<p>Uniqueness or rarity Area contains either</p> <ul style="list-style-type: none"> • unique („he only one of its kind), rare (occurs only in few locations) or endemic species, populations or communities, and/or • unique, rare or distinct, habitats or ecosystems; and/or • unique or unusual geomorphological or oceanographic features 	<p>Uniqueness or rarity An area or ecosystem that is unique or that contains rare species whose loss could not be compensated for by similar areas or ecosystems. These include:</p> <ul style="list-style-type: none"> habitats that contain endemic species; habitats of rare, threatened or endangered species that occur only in discrete areas; or nurseries or discrete feeding, breeding, or spawning areas. 	<p>The combination of features represented in the proposed Charlie Gibbs MPA is probably unique, including</p> <ul style="list-style-type: none"> The ridge itself with its mountain chains and peaks providing for a substantial hard substrate environment from abyssal to relatively shallow depths A major ridge fracture zone which offsets the ridge by 5° to the east and opens a deep sea biogeographic connection between the northwest and northeast Atlantic A permanent frontal area which maintains a north-south biogeographic divide, contributing to a relatively high species diversity An increased faunal biomass and probably elevated pelagic productivity near a permanent, meandering subpolar front, temporally and spatially variable between Lat 48-53 N.

OSPAR MPA network criteria <input type="checkbox"/> (OSPAR 2003-17)	CBD EBSA criteria <input type="checkbox"/> (COP 9 Decision IX/20 Annex I)	UN / FAO criteria of VMEs <input type="checkbox"/> (FAO 2009)	Qualifications of the proposed Charlie Gibbs MPA (see OSPAR 08/7/9-E, BDC 09/5/8-E and BDC 09/11/1-E, Annex 9)
<p>Ecological significance</p> <p>The area has:</p> <ul style="list-style-type: none"> a high proportion of a habitat/biotope type or a biogeographic population of a species at any stage in its life cycle; important feeding, breeding, moulting, wintering or resting areas; important nursery, juvenile or spawning areas; or 	<p>Special importance for life history stages of species</p> <p>Areas that are required for a population to survive and thrive</p>	<p>Functional significance of the habitat</p> <p>Discrete areas or habitats that are necessary for the survival, function, spawning/reproduction or recovery of fish stocks, particular life-history stages (e.g. nursery grounds or rearing areas), or of rare, threatened or endangered marine species</p>	<p>Due to its relatively high faunal biomass and probably elevated pelagic productivity near the subpolar front, the area is of particular importance as a</p> <p>feeding area for marine mammals, such as blue, sei and sperm whales, and seabirds from breeding colonies as far away as from the Azores</p> <p>The ridge structure is important for deep water sharks,</p> <p>its topographically induced hydrographic conditions enhance deepwater teleost fish aggregations, and</p> <p>it is an important reproduction area for roundnose grenadier, orange roughy and bathypelagic fish.</p> <p>The area provides otherwise scarce hard substrate and suitable current and feeding conditions to be an important stepping stone in the regional dispersal of cold water corals.</p>

OSPAR MPA network criteria <input type="checkbox"/> (OSPAR 2003-17)	CBD EBSA criteria <input type="checkbox"/> (COP 9 Decision IX/20 Annex I)	UN / FAO criteria of VMEs <input type="checkbox"/> (FAO 2009)	Qualifications of the proposed Charlie Gibbs MPA (see OSPAR 08/7/9-E, BDC 09/5/8-E and BDC 09/11/1-E, Annex 9)
<p>Threatened or declining species and habitats/biotopes</p> <p>The area is important for species, habitats/biotopes and ecological processes that appear to be under immediate threat or subject to rapid decline as identified by the ongoing OSPAR (Texel-Faial) selection process.</p> <p>Important species and habitats/biotopes</p> <p>The area is important for other species and habitats/biotopes as identified by the ongoing OSPAR (Texel-Faial) selection process.</p>	<p>Importance for threatened, endangered or declining species and/or habitats</p> <p>Area containing habitat for the survival and recovery of endangered, threatened, declining species or area with significant assemblages of such species</p>	<p>see</p> <p>Functional significance of the habitat</p> <p>Uniqueness or rarity</p>	<p>The proposed MPA provides an important functional habitat to</p> <p>demersal deep water fish like a.o. orange roughy, grenadiers, redfish, alfonsoinos and deep-water sharks. The decline of these taxa is documented, however the severity of decline remains unclear to date</p> <p>marine mammals such as sperm, sei, fin and blue whales,</p> <p>Migratory seabirds</p> <p>Living <i>Lophelia pertusa</i> and 40 other coral taxa have been observed at all depths and locations surveyed, although not in the extensive reef-type structures found off the coast of Norway .</p> <p>Rich hexactinellid sponge communities or ‘gardens’ around the Charlie Gibbs Fracture Zone and the associated seamounts occur down to 3000 m depth.</p> <p>many of the features listed as threatened and/or declining species/habitats by OSPAR (2008).</p>

OSPAR MPA network criteria <input type="checkbox"/> (OSPAR 2003-17)	CBD EBSA criteria <input type="checkbox"/> (COP 9 Decision IX/20 Annex I)	UN / FAO criteria of VMEs <input type="checkbox"/> (FAO 2009)	Qualifications of the proposed Charlie Gibbs MPA (see OSPAR 08/7/9-E, BDC 09/5/8-E and BDC 09/11/1-E, Annex 9)
<p>Sensitivity</p> <p>The area contains a high proportion of very sensitive or sensitive habitats/biotopes or species.</p>	<p>Vulnerability, fragility, sensitivity, or slow recovery</p> <p>Areas that contain a relatively high proportion of sensitive habitats, biotopes or species that are functionally fragile (highly susceptible to degradation or depletion by human activity or by natural events) or with slow recovery</p>	<p>Fragility</p> <p>(an ecosystem that is highly susceptible to degradation by anthropogenic activities)</p> <p>Life-history traits of component species that make recovery difficult</p> <p>(ecosystems that are characterized by populations or assemblages of species with one or more of the following characteristics:</p> <ul style="list-style-type: none"> slow growth rates; late age of maturity; low or unpredictable recruitment; or long-lived. 	<p>Complex benthic habitats</p> <p>Coral and sponge communities in deep water are extremely slow growing, with occurrence and growth being limited by substrate and food availability.</p> <p>Deepwater sharks</p> <p>44 species of deep water sharks known from the area, among these three species listed as particularly threatened and/or declining by OSPAR. Generally, deepwater sharks are confined to the upper 2000 m of the ocean, all within fishing depth, and extremely sensitive to overfishing due to their life history traits. They require a high energy environment such as around seamounts, the peaks of the ridge and near the subpolar front.</p> <p>Seamount fish spawning aggregations</p> <p>The commercially most relevant fish species from the area (roundnose grenadier, redfish, orange roughy, alfonso, cardinal fish, ling, tusk) are typical K-strategists and form temporal aggregations which makes them highly vulnerable to overfishing.</p>

OSPAR MPA network criteria □(OSPAR 2003-17)	CBD EBSA criteria □(COP 9 Decision IX/20 Annex I)	UN / FAO criteria of VMEs □(FAO 2009)	Qualifications of the proposed Charlie Gibbs MPA (see OSPAR 08/7/9-E, BDC 09/5/8-E and BDC 09/11/1-E, Annex 9)
Ecological significance The area has: a high natural biological productivity of the species or features being represented.	Biological productivity Area containing species, populations, or communities with comparatively higher natural biological productivity		Compared with other oceanic habitats such as the abyssal plains and their oligotrophic pelagic zones, it is likely that the productivity on the MAR is high, within the meandering subpolar front even similar to more northern waters.
High natural biological diversity The area has a naturally high variety of species (in comparison to similar habitat/biotope features elsewhere) or includes a wide variety of habitats/biotopes (in comparison to similar habitat/biotope complexes elsewhere)	Biological diversity Area contains comparatively higher diversity of ecosystems, habitats, communities, or species, or has higher genetic diversity	Structural complexity (an ecosystem that is characterized by complex physical structures created by significant concentrations of biotic and abiotic features. In these ecosystems, ecological processes are usually highly dependent on these structured systems. Further, such ecosystems often have high diversity, which is dependent on the structuring organisms)	The benthic and pelagic species diversities recorded so far, and the range of habitats found within the proposed MPA are extensive. The inclusion of at least two faunal biogeographic provinces raises the diversity above similar or smaller areas comprising fewer habitats and e.g. only a single province. The diversity of corals is assumed to be higher than on the northern continental shelves.

OSPAR MPA network criteria □(OSPAR 2003-17)	CBD EBSA criteria □(COP 9 Decision IX/20 Annex I)	UN / FAO criteria of VMEs □(FAO 2009)	Qualifications of the proposed Charlie Gibbs MPA (see OSPAR 08/7/9-E, BDC 09/5/8-E and BDC 09/11/1-E, Annex 9)
Naturalness The area has a high degree of naturalness, with species and habitats/biotope types still in a very natural state as a result of the lack of human-induced disturbance or degradation.	Naturalness Area with a comparatively higher degree of naturalness as a result of the lack of or low level of human-induced disturbance or degradation		The overall size of the proposed Charlie Gibbs MPA is such that most of the area can be expected to be unaffected by human activities. However the relatively small area of the ridge structures within fishing depth are likely to have been at least explored if not commercially fished involving damage of unknown scale to benthic biota and the deepwater fish community. Indications are the relatively frequent observations of lost fishing gear.
Representativity The area contains a number of habitat/biotope types, habitat/biotope complexes, species, ecological processes or other natural characteristics that are representative for the OSPAR maritime area as a whole or for its different biogeographic regions and sub-regions.	Representativity MPA network criterion(COP 9 Decision IX/20 Annex II)		The area is nominated for its importance as a section of the northern Mid-Atlantic Ridge, The area proposed is large enough to represent all functional habitats and communities of the northern Mid Atlantic Ridge around the Charlie Gibbs Fracture Zone and adjacent abyssal plains. It includes a large number of identified seamounts with a summit depth shallower than 1500 m, and a permanent oceanic front.

Applying the CBD 'EBSA' criteria for identifying ecologically or biologically significant marine areas in need of protection (CBD COP IX Resolution IX/20) to the Nazca and Salas y Gomez submarine ridges

1. Background

The Salas y Gomez and Nazca ridges are two sequential chains of submarine mountains of volcanic origin located in the Southeastern Pacific Ocean, which together have an extension of 2,900 km. The Salas y Gomez ridge lies in a west-east orientation localized between 23°42' S and 29°12' S and the 111°30' W and 86°30' W. In its western end it intersects the East Pacific Rise inside the Chile insular EEZ (Easter Island) and its eastern end adjoins to the western end of Nazca ridge.

The Nazca ridge spreads in a southwest-northeastern direction and is localized between the parallels 15°00' S and 26°09' S and between the meridians 86°30' W and 76°06' W. In its southern end involves part of the Chile insular EEZ (San Felix Island) and in its northern end is introduced all the way to the Peru-Chile subduction zone (Peru EEZ).

The area beyond national jurisdiction under analysis covers about 1,246,608 km², which represent approximately 5.04% of the international waters surface in the FAO area No. 87. Further, it contains about 110 seamounts with summits between the sea surface level and 2,000 m depth (fishable depths), which represent some 41% of the seamounts in the Southeastern Pacific Ocean. The area is a hotspot with one of the highest levels of marine biological endemism (41.2% in fishes and 46.3% in invertebrates) in the World and also is considered a stepping stone for some marine mammals (e.g., blue whale, Rodrigo Hucke-Gaete personal communication). It has been described as recruitment and nursery area for swordfish (*Xiphias gladius*) (Yañez et al., 2004, 2006, 2009) and it is part of the breeding zone described for Chilean jack mackerel (*Trachurus murphyi*) (Arcos et al., 2001; Anon., 2007).

Until now the area has been subject of minor, localized and sporadic activities, like bottom fishing and geological surveys and, therefore, a high degree of naturalness is expected for many seamounts into the area.

The area to which we have applied the criteria does not consider the zone inside the EEZ of Chile and Peru. It is circumscribed by the polygon of vertexes and semi-curves (see Fig.):

- (A) 79° 12' 27" W and 19° 11' 20" S;
- (B) 81° 07' 24" W and 19° 11' 20" S;
- (C) 85° 44' 56" W and 23° 08' 36" S;
- (D) the northern intersection formed by the meridian 102° 34' 07" W and the arc produced by EEZ of Salas y Gomez Island;
- (E) the Eastern arc generated by EEZ of Salas y Gomez Island between the vertex (D) and (F);
- (F) the southern intersection formed by the meridian 104° 29' 45" W and the arc produced by EEZ of Salas y Gomez Island;
- (G) the southern intersection formed by the meridian 82° 30' 13" W and the arc produced by EEZ of San Felix Island;
- (H) the western arc generated by EEZ of San Felix Island between the vertex (G) and (I);
- (I) the northern intersection generated by the meridian 81° 26' 00" W and the arc produced by EEZ of San Felix Island.

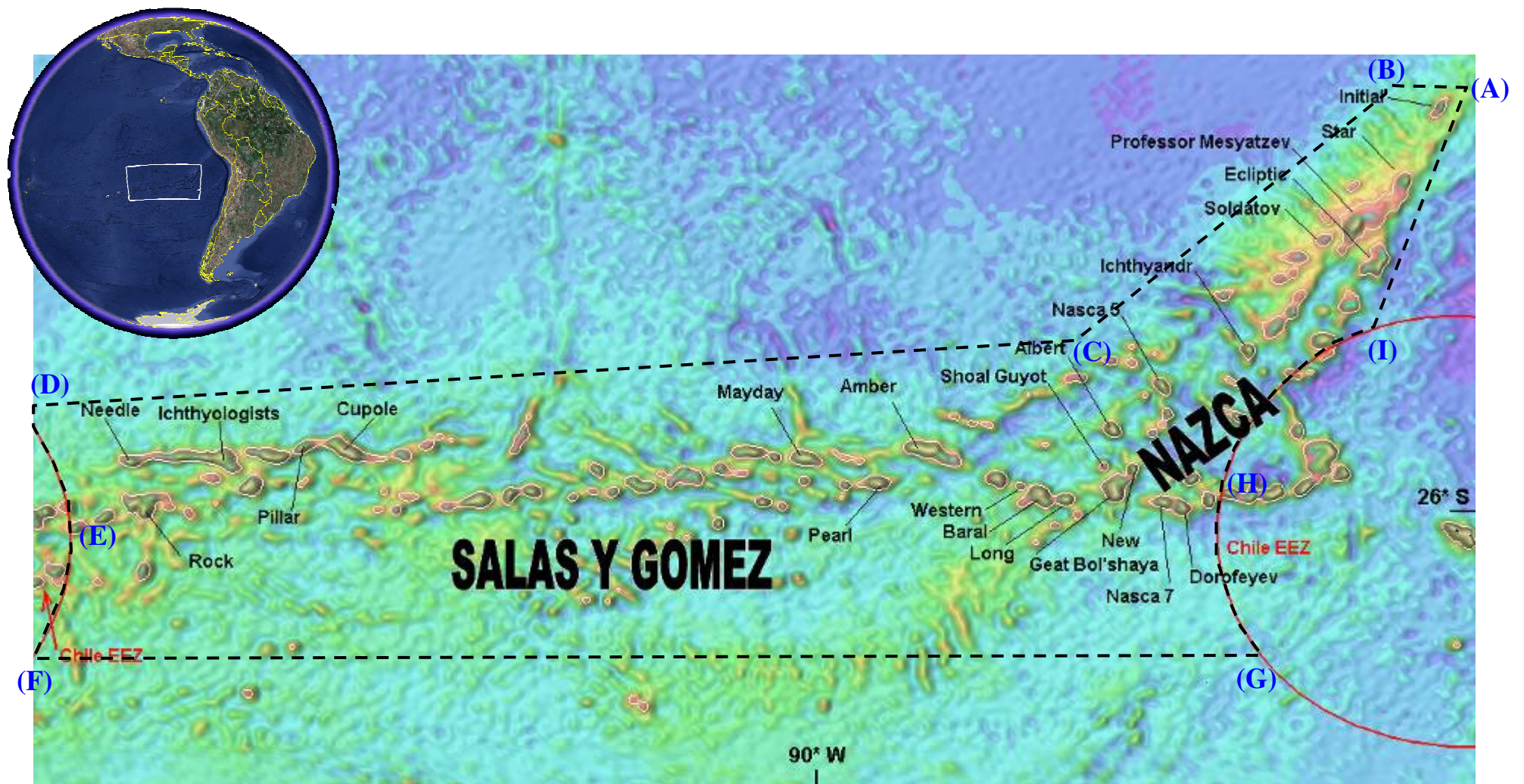


Figure: Location of Nazca and Salas y Gomez seamounts and area (dotted line) of application of criteria. The seamounts' names for which biological information is available are identified.

2. Checking Nazca and Salas y Gomez (N&SG) submarine ridges against the CBD ‘EBSA’ criteria

Criterion	Nazca & Salas y Gomez ridges
Uniqueness or rarity	The seamounts of N&SG are unique in that they constitutes a biogeographical province much more closely related to the Indo-West Pacific than to the eastern Pacific. Findings in the area shown high endemism rates, reached to 41.2% in fishes and 46.3% in invertebrates associated to the bottom (Parin <i>et al.</i> , 1997; Mironov <i>et al.</i> , 2006). These endemism rates are the higher found in seamounts, and surpass rates of ecosystems associated with hydrothermal vents, one of the most isolated in the Ocean (Richer de Forges <i>et al.</i> , 2000).
Special importance for life history stages of species	Nazca ridge and the eastern end of Salas y Gomez ridges are considered to be the main recruitment area for Chilean jack mackerel and a nursery zone for swordfish (Yañez <i>et al.</i> , 2004, 2006). Almost half of all invertebrates recorded live in those seamounts; therefore, the habitat provided by these seamounts is required for invertebrate populations to survive and thrive. It provides the only extensive hard substrate available for propagation of benthic suspension feeders like Antipatharians and Scleractinians.
Importance for threatened endangered or declining species and/or habitats	Much of the fauna recorded in Nazca and Salas y Gomez ridges is endemic to their seamounts. Therefore, due the scarce information most of benthic or benthopelagic species inhabiting these ridges are not evaluated in their status or are data deficient classified in the IUCN Red List. However, the ridges offer habitat for a number of low resilient and long-living species like deep water sharks (Parin and Kotlyar, 2007), oreos, alfonsino, and reef-builder coral (e.g., <i>Madrepora oculata</i>). If these species are adversely affected they may easily become threatened.
Vulnerability, fragility, sensitivity or slow recovery	In particular deep water species and biogenic habitats such as formed by cold water corals and sponges are considered vulnerable (Koslow, 2007), as often fragile, and slow (if at all) to recover due to slow growth, retarded maturity and high generation length, as well as population characteristics of high diversity at low biomass. Please see below for illustration: “Significant changes were noted between 1979-1980 and 1987 in the structure of bottom communities. Antipatharians were destroyed by the bottom otter-trawl [...], and [cirripedes] were lost with their substratum animals, [while] populations of sea urchin [, who feed over cirripedes,] declined following the destruction” (Parin <i>et al.</i> , 1997: 178)

Biological productivity	<p>Daneri <i>et al</i> (2000) have shown strong evidence that may support the formation of Taylor columns over the seamounts of Nazca ridge, and the occurrence of local upwelling process in Nazca area, making this area particularly more productive than the surrounding South-eastern Pacific Ocean.</p> <p>The Nazca area is slightly influenced by the eastern boundary currents of the South Pacific anticyclonic gyre. The Chile Current arises in the Subantarctic region. Thus, it carries “equatorward”, along the coast of Chile, Subantarctic Water. When it reaches approximately 20° S, influenced by the southeast trade winds and coastal configuration, turns westward, away from the coast influencing Nazca area with rich-nutrients waters (Galvez, in press).</p>
Biological diversity	<p>Few comprehensive studies have been conducted on the N&SG ridges. Taking into account only the Russian research, we know that 192 species of benthopelagic and benthic invertebrates and 171 species of fishes inhabit the 22 explored seamounts of the Nazca and Salas y Gomez ridges (Parin et al., 1997). If we consider that the area comprise at least 110 seamounts, then we can expect to discover a much higher biodiversity. It is important to note that the bottom of Nazca and Salas y Gomez ridges has not been biologically sampled. Elevations and depths ranging from abyssal soft sediment plains and trenches to the hard bottom peaks of seamounts and hills on the ridges may provide for an extensive range of ecological niches.</p>
Naturalness	<p>It can be assumed that most seamounts along the Nazca ridge were at least explored once. There is evidence of sporadic deep fishing (trawling and pots) by Russian and Chilean fleet (Galvez, in press)</p> <p>There are indications that big branches of gorgonias were destroyed by trawlers (Parin et al., 1997). However, from beyond fishing depth, no significant human impacts are known. In the case of Salas y Gomez ridge, most of the fishing activity carried out is on pelagic layer (Vega et al., 2009). Only the former URSS scientific expeditions and Chilean fishing fleet are know to fish in this area (Galvez, in press)..</p>

3. Conclusion

WWF finds that the area under study fulfills the criteria adopted by the CBD. In applying the criteria to what WWF had considered to be an ecologically and biologically significant area before, we find that the criteria served their purpose well and cover the main aspects that should be considered when identifying such areas.

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Jennifer Smith, WWF Canada, 21 August 2009

**Applying the CBD ‘EBSA’ criteria for identifying ecologically or biologically significant marine areas in need of protection (CBD COP IX Resolution IX/20):
a case study on the Grand Banks**

1. Introduction

Work done to date on the identification of areas of ecological and biological significance in the Northwest Atlantic has consistently highlighted the area known as the Southeast Shoal, laying the groundwork for recognition as an Ecologically and Biologically Significant Area (EBSA), and demonstrating the practical utility of the CBD criteria for site selection. This brief document has been collated to serve as a case study of the application of the CBD EBSA criteria to an interesting high seas/domestic open ocean ecosystem. **The consistent findings of scientists, government and NGOs demonstrate the utility of the CBD criteria for this purpose.**

Overview of the Southeast Shoal

The Southeast Shoal (also referred to as the “Southeast Shoal and Tail of the Grand Bank” and the Southern Grand Bank”) is a shallow sandy plateau located on the southern Grand Bank, off the Atlantic Canadian province of Newfoundland and Labrador. The Shoal is a relict beach habitat from the last glacial advance; home to three relict beach populations (blue mussel, wedge clam, and capelin); an important nursery area for yellowtail flounder, American plaice, and Atlantic cod (plaice and cod are severely depleted); an important spawning area for capelin, and an important feeding area for many cetaceans and seabirds (see Fuller and Myers 2004).

2. Progress toward assessing the Southeast Shoal on the basis of the CBD criteria

This document consolidates two instances where experts have assessed the Southeast Shoal for its ecological and biological significance – one of which were structured to respond directly to the CBD EBSA criteria.

Fuller, S.D. and R.A. Myers. 2004. The Southern Grand Bank: a marine protected area for the world. WWF-Canada, Halifax. 99p.

In this 2004 report, Fuller and Myers document the properties of the southern Grand Bank and specifically, the Southeast Shoal. Their report gathers data-based evidence for:

- The high **productivity** of the ecosystem, which has sustained exceptionally abundant and commercially valuable marine life for centuries.
- The **special importance of the area for the life history stages** of several species: the region is known as a spawning and feeding ground for many fish, birds and marine mammals.
- They also document the **uniqueness/rarity** of the area as a relict beach ecosystem containing unusual offshore populations of blue mussel and wedge clam.

- The **importance of the area for threatened and/or declining species**, given the currently severely altered state of the Northwest Atlantic ecosystem and the importance of the area as a nursery habitat for cod, home to an offshore spawning population of capelin (an important forage species for groundfish), a discrete population of humpback whales, and migrating leatherback and loggerhead turtles.
- The deep sea, cold water coral species that are inherently **vulnerable, fragile and slow to recover** from disturbance.
- The relative **naturalness** of this area in a region where intensive industrial fishing has led to large-scale ecosystem collapse.

Templeman, N.D. 2007. Placentia Bay – Grand Banks Large Ocean Management Area Ecologically and Biologically Significant Areas. Canadian Science Advisory Secretariat Research Document 2007/052.

Document abstract: The purpose of this report is to identify Ecologically and Biologically Significant Areas (EBSAs) for the Placentia Bay-Grand Banks Large Ocean Management Area (PBGB LOMA) based on the guidelines in CSAS Ecosystem Status Report 2004/006. The exercise was carried out using information from several key documents that detailed ecosystem overview and status, fish distribution and spawning, and single species assessment. Scientists in the Newfoundland Region also provided input on those areas that they felt could be deemed significant based on their knowledge and experience. The result of these exercises was the identification and description of 11 EBSAs and their significant features, as well as a corresponding map.

Canada has developed a very closely aligned set of criteria for the identification of EBSAs in domestic waters: in fact, Canada's work on these criteria was one of the major sources for the CBD criteria. This document predates the adoption of the final CBD criteria; however the criteria can be easily 'crosswalked'.

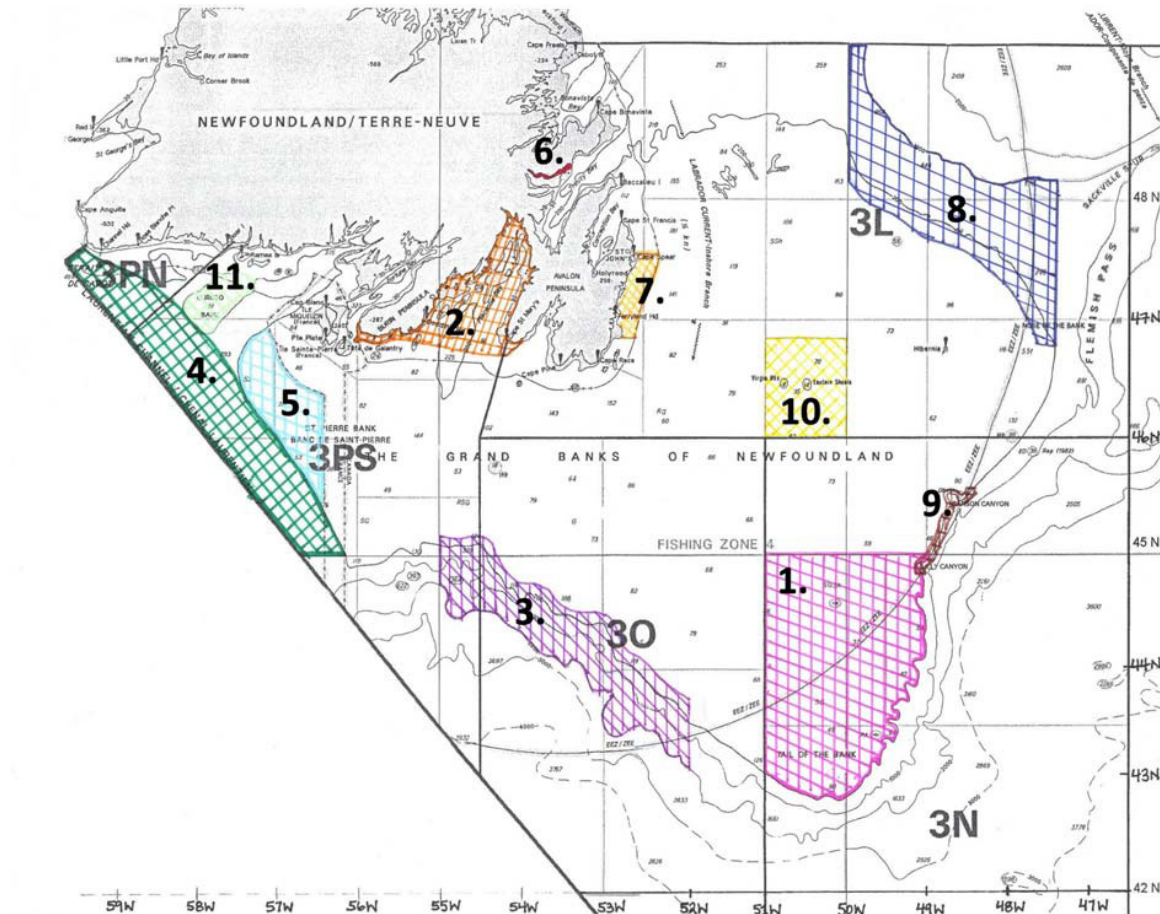
See table 1 for a point-form summary of the assessment of the Southeast Shoal on each criteria.

3. Conclusion

In order to provide perspective on the practicality and applicability of the EBSA Criteria, WWF-Canada has collated and reviewed a number of assessments which have investigated the significance of the Southeast Shoal and Tail of the Grand Banks, an area in the Northwest Atlantic off of the Canadian province of Newfoundland and Labrador. This area straddles domestic and High Seas waters and has been of great historical and present-day importance to many fishing countries. It may also hold one of the keys to recovery of this highly degraded regional ecosystem.

Our review found that similar applications of the Criteria were consistent in highlighting this area as one of the most significant in the region: we believe that this lends credence to the Criteria and their utility.

Map from Placentia Bay – Grand Banks Large Ocean Management Area Science Based Conservation Objectives, Canadian Science Advisory Secretariat. Science Advisory Report 2007/042.



The Southeast Shoal is area 1.

1. The Southeast Shoal and Tail of the Banks
2. Placentia Bay Extension
3. The Southwest Shelf Edge and Slope
4. Laurentian Channel and Slope
5. St. Pierre Bank
6. Smith Sound
7. Eastern Avalon
8. Northeast Shelf and Slope
9. Lilly Canyon-Carson Canyon
10. Virgin Rocks
11. Burgeo Bank

Table 1: Application of the EBSA criteria to the Southeast Shoal, conducted for the Placentia Bay – Grand Banks Large Ocean Management Area Ecologically and Biologically Significant Areas

Fisheries and Oceans Canada EBSA criteria				
Uniqueness or Rarity	Aggregation (Density/Concentration)	Fitness Consequences (Importance to Reproduction/Survival)	Sensitivity (Resilience to Disturbance)	Naturalness (Undisturbed State of Habitat)
Analogous CBD EBSA Criteria				
Uniqueness or rarity Importance for threatened, endangered or declining species and/or habitats Biological diversity	Special importance for life history stages of species Biological productivity	Special importance for life history stages of species Biological productivity	Vulnerability, fragility, sensitivity or slow recovery	Naturalness
<p>High- Spawning/Breeding- The Southeast Shoal is the only known offshore spawning site for Capelin (Fuller and Myers 2004; F. Mowbray pers. comm.).</p> <p>High- Nursery/Rearing- The Southeast shoal is the single nursery area of the entire stock of Yellowtail flounder (Walsh et al. 2001).</p> <p>High- Oceanographic processes- The Southeast Shoal has the warmest bottom water temperatures on the Grand Banks (Fuller and Myers 2004).</p> <p>High- Oceanographic processes- A well-defined gyre exists on the Southeast Shoal</p> <p>High- Structural Habitat- The Southeast Shoal is unique in that it is the only shallow sandy offshore shoal in the LOMA (Fuller and Myers 2004).</p> <p>High- Biodiversity- The Southeast Shoal was the last part of the Grand Banks to be deglaciated. As a result, relict populations of blue mussel, wedge clam and capelin associated with</p>	<p>High- Spawning/Breeding- Capelin and northern sand lance aggregate on the Southeast Shoal to spawn (Fuller and Myers 2004; F. Mowbray pers. comm.).</p> <p>High- Spawning/Breeding-The shoal is a spawning area for several groundfish species (American Plaice, Yellowtail Flounder, and Atlantic Cod) (Fuller and Myers 2004; Ollerhead et al. 2004).</p> <p>High- Nursery/Rearing- The Southeast shoal is an important nursery area for Yellowtail flounder, 3NO Cod, and American plaice (Walsh et al. 2001).</p> <p>High- Feeding; Biodiversity- The presence of important forage species in the area draws large aggregations marine mammals (especially humpbacks and northern</p>	<p>High- Spawning/Breeding-Offshore spawning capelin may be a genetically separate population and therefore the Southeast Shoal could be considered an exclusive spawning area and vital to the fitness of the population (F. Mowbray pers. comm.)</p> <p>High- Feeding- Important seasonal foraging area for cetaceans (especially humpbacks) and seabirds</p> <p>High- Biodiversity- The Tail of the Banks is important to the survival of the Striped wolffish since it is listed by COSEWIC as being of “special concern” (ie...”<i>particularly sensitive to human activities or natural events...</i>”)</p> <p>Moderate- Biodiversity-While the Southeast Shoal is not important to the survival of a greater proportion of the total species in the area, it is important to the survival and reproduction of several “degraded”</p>	<p>Moderate- As a shallow shoal, the sandy bottom habitat that dominates the area is subject to regular physical disturbance by wave action from storms. So, the habitat itself is naturally dynamic and less sensitive to disturbance.</p> <p>However, the ecosystem and many of its components have been severely altered by fishing, which has altered community and ecosystem structure. For example, haddock and Atlantic cod were once abundant in this area but both species have been severely depleted by fishing and therefore are not fulfilling the same role in the ecosystem as they did in the past.</p> <p>Thus, given the disturbed state of the ecosystem, it is highly</p>	<p>Moderate to Low- While regular physical disturbance from storms of the sandy bottom habitat is common in this area, the hydraulic dredging that takes place on the shoal likely disturbs sediment to a greater depth and with a different impact than any natural disturbance. Many of the resources themselves have been depleted, with significantly lower-than-natural populations of Atlantic cod, American plaice and capelin, for example.</p>

<p>beach habitats from the last glacial advance remain in the area. The two bivalve species are typically found in inshore areas and capelin normally spawn on beaches so all of these populations are unique (Fuller and Myers 2004; F. Mowbray pers. comm.).</p> <p>High- Biodiversity- The Southeast Shoal contains the highest benthic biomass on the Grand Bank (Walsh et al. 2001)</p>	<p>bottlenose) and seabirds.</p> <p>High- Feeding- The greatest concentration of Yellowtail flounder, the shallowest groundfish, is found on the Tail of the Banks, extending northwards over the Southeast Shoal and central Grand Bank (Kulka et al. 2003)</p> <p>High- Oceanographic processes- The Southeast Shoal is an area of high primary productivity.</p> <p>High- Biodiversity- The densest concentration of Striped wolffish (listed as 'special concern' by COSEWIC) occurs on the Tail of the Banks</p> <p>Moderate- Feeding- Although American Plaice is distributed across all of the Grand Banks, an area of highest density is returning to the Tail of the Banks since the mid 1990's (Kulka et al. 2003)</p>	<p>species. The area is also important to supporting and maintaining the diversity of the benthos found there.</p>	<p>probable that ecosystem and community resilience in the Southeast Shoal area has been diminished, leaving it sensitive to further disturbance.</p>	
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BIOTRANS - A Potential MPA

Location

BIOTRANS is the acronym for the study site of two successive long term research projects on the carbon flux in the near-bottom water layers and sediments in the deep sea. The research box is situated at 47°-47°30'N, 19°-20° W in the West European Basin, at the foothills of the Mid-Atlantic-Ridge, close to its junction with the Porcupine Abyssal Plain.

Potential Reasons for Selection

The BIOTRANS site was subject to intensive investigations from 1984-1994 and was later revisited several times. The data provide an excellent picture of deep sea abyssal energy flow and an insight into the food webs of the benthic boundary layer and the sediments. This area depicts an example for one type of abyssal plain present in the North-East Atlantic and should be incorporated in a representative network of marine protected areas.

Site description

The BIOTRANS research area in the West European Basin is part of a larger study area investigated by the Northeast Atlantic Monitoring Programme (NOAMP, 1982-1985) in connection with the dumping of nuclear wastes at the Nuclear Energy Agency (NEA) dump site (46° N 17° W). The area is structured by ridges and furrows stretching more or less parallel to the Mid-Atlantic-Ridge (NNE-SSW). Further, a seamount

characterized by 3 peaks is rising to about 700 m above the surrounding of an average depth range of 4500-4560 m (Fig.1). The

hydrography is characterized by only slight variations of temperature (2.54-2.63° C) and salinity (34.9 PSU). Vertically,

the gradients of temperature, salinity and current velocity decrease with decreasing distance to the bottom

whereas particle concentration increases. The seafloor shows many „footprints“ of biological activity.

For information, contact:

Stephan Lutter

WWF North-East Atlantic Programme

Am Güthpol 11 · D-28757 Bremen · Germany

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

E-mail: lutter@wwf.de

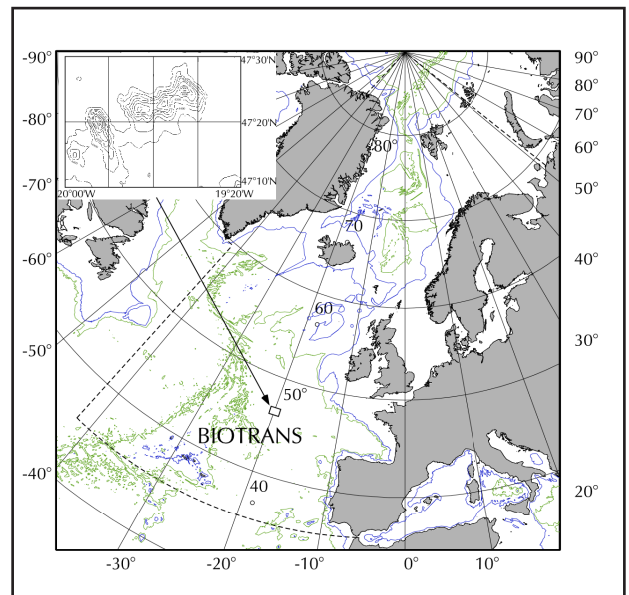


Fig. 1: The BIOTRANS research area. A deep sea abyssal plain in the West European Basin.

Benthic boundary layer

The near-bottom water layer is enriched with suspended matter („marine snow“) up to 1000 m above the seafloor in the plains, caused by the topographically influenced bottom flow resuspending the very fine material, and sometimes significantly enhanced by aperiodic, so-called „benthic storms“. Here, organic material is accumulating as well which seasonally sediments out from the photic zone, finally forming layers or aggregations of phytodetritus on the seafloor. This material is in turn the major food source for the organisms living above, on and in the sediment. Short- and medium-term reactions to pulses of organic material were observed in the benthos and bacteria. In other words, the seasonal pulses of organic matter drive the deep-sea ecosystem.

The fauna of the benthic boundary layer

The deep sea floor is known to support a remarkable faunal biodiversity. At a global scale, deep sea sediments have been estimated to contain between 500,000 and 10 million species of macrobenthos alone. A single square meter of sediment may accommodate 250 species of macro- and meiobenthic invertebrates. Polychaetes, nematodes and copepods are the most abundant groups within the meio- and macrofauna at the usually soft-bottomed BIOTRANS site. Occasional stones and pebbles give substrate to sea anemones and sea pens which are the most commonly found members of the megafauna, the larger animals living on the sediment. Sponges, sea cucumbers and crinoids also frequently appear on bottom photographs, whereas crustaceans, gastropods, cephalopods, sipunculids and madreporarians only occur in low numbers. The density of the larger animals living on the sediment, the megafauna, amounts to 2.5 per m².

**Justification for the
Potential Selection of
the BIOTRANS
Deep Sea Abyssal Plain
as an Offshore
Marine Protected Area**

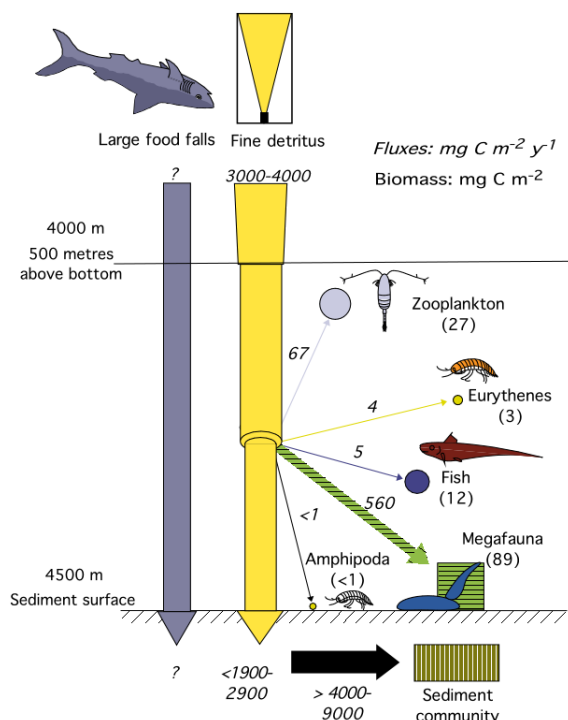


Fig. 2: Carbon flux in the deep sea benthic boundary layer. Episodic large food falls and sedimentation events directly reach the seafloor. Courtesy of B. Christiansen, GEOMAR Kiel.

The benthopelagic community which lives in the water column, but is associated to the seafloor, consists of a wide variety of zooplankton and nekton species, including large scavenging amphipods and fishes. Apart from planktic bacteria, zooplankton accounts for more than 60 % of the total benthopelagic biomass at the BIOTRANS site, whereas fish species contribute 31 % and amphipods 2 %. The fish fauna at BIOTRANS is dominated by several species of rattails, only deep sea eels also occurring in significant numbers. They are generalist feeders with a very low metabolism. Little is known about their reproduction patterns, generation times and longevity. This composition of the megafaunal and benthopelagic communities is site-specific and probably depends on the surface production pattern. At the BIOTRANS site, a fine rain of detritus seems to support a comparatively large biomass of suspension feeding megabenthos and zooplankton, whereas in other deep-sea areas, a more or less regularly occurring input of large food falls, e.g. in the form of dead cephalopods, sustains high abundance of scavenging fish and amphipods.

Threats

At present, no immediate threats are evident. The site is in an (almost) natural state, irrespective of the remainders of ship traffic on the surface. However, options for disposal of wastes of several kind in the deep sea are discussed.

Management Issues

This area should be set aside as a Marine Protected Area (MPA) for research purposes. With regard to the recent developments in climate research, long term datasets from the deep sea are precious reference points for undisturbed natural variability of the ecosystem, particularly in the light of observed long-term faunal changes in the deep sea.

Legal aspects

The BIOTRANS site is located in the OSPAR Maritime Area in international waters - in the „High Sea“ according to the UN Convention on the Law of the Sea (UNCLOS). Special provisions apply to the seabed beyond the continental margin, „the Area“. The Area and its resources are declared to be the „Common Heritage of Mankind“. Contracting parties to UNCLOS have the general obligation to „protect and preserve rare or fragile ecosystems as well as the habitat of depleted, threatened or endangered species and other forms of marine life“ (Article 194(5)). It may adopt appropriate rules, regulations and procedures for, *inter alia*, the protection and conservation of the natural resources of the Area and the prevention of damage to flora and fauna of the marine environment. Furthermore, the Convention on Biological Diversity obliges its Contracting Parties to conserve and sustainably use biodiversity by *inter alia* creating protected areas (Article 8(a)). This obligation is reflected by Annex V of the OSPAR Convention. However, no legal regulations exist for the establishment and implementation of Marine Protected Areas (MPAs) in „the Area“. So far, the mandate of the International Seabed Authority (ISA) is limited to environmental protection in the context of exploitation of mineral resources, having developed a mining code for manganese nodules and being in the state of developing similar codes for the exploitation of polymetallic sulphides and cobalt crusts (by 2001), and further envisaging regulations on genetic resources and gas hydrates to be in place at a later stage.

Action required

Legal regulations for the establishment and implementation of marine protected areas in „the Area“ are required. This should be part of the Law of the Sea, hence it is a matter of the United Nations. In order to raise this at the UN General Assembly in the framework of its debate on „Oceans and the Law of the Sea“, OSPAR should formally support Contracting Parties to put the issue of MPAs in „the Area“ onto the UN agenda.

Text prepared by Sabine Christiansen

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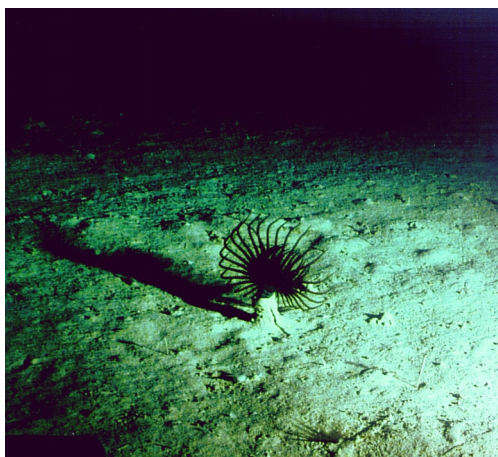


Fig. 3: Deep-sea abyssal plain at the BIOTRANS site. Anemones and „footprints“ of life. Photograph by B. Christiansen

Logatchev - A Potential MPA

Location

The Logatchev vent area consists of two distinct hydrothermal vent fields. Logatchev-1 is located at 14°45'N 44°58'W and Logatchev-2 at 14°43.22'N, 44°56.27'W. It is the southernmost hydrothermal vent field on the Mid-Atlantic Ridge (MAR) known today.

Potential Reasons for Selection

Logatchev is the largest vent area on the MAR encompassing about 200 000 m² as observed so far. It hosts the highest diversity of species and biotopes known from the MAR. The high diversity of biotopes presents a unique opportunity to understand how the structure and composition of hydrothermal hot vent communities is controlled by their geological settings. Located approximately 1000 km from the next vent field (Snake Pit), Logatchev is the most isolated vent field on the ridge. As the faunal exchange between the vents decreases with distance, the fauna found at Logatchev might differ considerably from the others and have a high degree of endemism.

Site Description

The Logatchev vent area is located on an uplifted rock at the eastern slope of the rift valley, an unusually shallow location. In contrast to other vent fields, it is not based on basalt but ultramafic rocks with a high methane content in the fluids. The Logatchev-1

field consists of three distinct sites, a large sulphide mound with smoking craters, an active chimney complex known as Irina-2 and a diffuse flow through soft sediment called Anya's garden. Within these areas, highly variable biotopes are found, including black smokers, smoking craters, diffuse flow areas, bacterial mats, mussel beds and sedimented areas. Two different types of smokers

occur, the more common vertically flowing ones, and the so-called creeping smokers that spread horizontally.

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

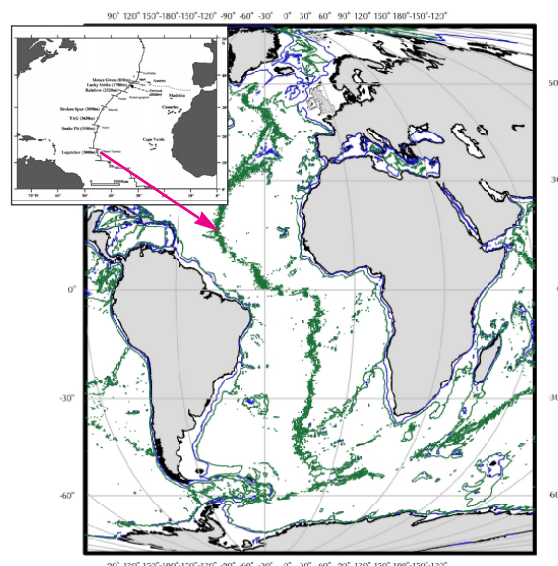


Fig. 1: Location of the Logatchev hydrothermal vent field on the Mid-Atlantic Ridge (MAR). The inserted map depicts the eight active hydrothermal vent fields known to date on the MAR between the equator and the Azores Archipelago. The major transform faults are also drawn on the map (from Desbruyères et al. 2000).

Logatchev-2 consists of six sulphide mounds within a field of about 550 times 200 m. There are extensive massive sulphide deposits in the area containing an unprecedented high concentration of copper, zinc, gold and with an anomalously high uranium level. The cobalt concentration is also higher than in other hydrothermal vent fields. Further hydrothermal activities have been recorded north-east and south of the Logatchev-1 field but nothing is known yet about them except that they are showing a high concentration of commercially valuable minerals as well.

Biological Features

With an estimated number of 50 species from several different taxa including sea anemones, crabs, mussels and starfish, Logatchev hosts the highest species diversity known in the region at present. It is likely that it also has the highest biomass, as estimates for mussels alone are significantly higher than in other vent fields. As in other vent fields, mussels from the genus *Bathymodiolus* are quite abundant, yet the represented species differs significantly from other sites. Several taxa have been found which are new to the region, including vesicomid and thyasirid bivalves and cerithiacean gastropods. The vesicomid clam population is the first living clam population that has been recorded from the MAR and is of special scientific interest. At the Logatchev-2 field, no modern hydrothermal activity has been observed so far and thus no living associated fauna. However, the subfossil

**The Logatchev
vent field -
a Showcase Example
for a High Seas
Network of Marine
Protected Areas**

valves of two bivalve species of the family *Vesicomyidae* found are new records for hydrothermal vents and give further insight into the biogeography and composition of the Atlantic hot vent fauna.



Fig. 2: Population of vesicomyid clams at Anya's Garden. Also seen on the photograph are the mussels *Bathymodiolus* sp. aff. *puteoserpentis*, ophiuroids *Ophioctenella acies*, galatheid crab *Munidopsis* sp. and unidentified fish (in: Gebruk et al. 2000)

Threats

The Logatchev hydrothermal vent area has been visited by several expeditions since its discovery in 1994 and a further one is planned for 2003. Research activities can adversely affect vent systems e.g. by sampling when not managed and monitored adequately. The area's extensive massive sulphide deposits with their high copper and uranite concentration and its high species and biotope diversity makes the Logatchev area especially susceptible to harm from prospective mining activities and bioprospecting. In case of mining, radioactivity might be released and enter the environment due to the high uranite content in the massive sulphides. The effect of radioactivity to deep-sea ecosystems is totally unknown. Screening for massive sulphides has already taken place in the area and sites close to the vent field have been declared as being promising for massive sulphides. Bioprospecting, while not necessarily harmful, needs to be managed carefully to ensure that sampling techniques are not damaging.

Legal aspects

The Logatchev vent field is located on the High Seas, in the "Area", and therefore falls within the jurisdiction of the International Seabed Authority (ISBA), a body established under the UN Convention on the Law Of the Sea (UNCLOS, 1982). The "Area" and its resources have been designated as the "common heritage of mankind" [sic]. Pursuant to UNCLOS, all rights to the resources are vested in mankind [sic] as a whole, on whose behalf the ISBA shall act. In accordance with the terms of UNCLOS and other provisions of international law, States are under an obligation to „*protect and preserve rare or fragile ecosystems as well as the habitat of depleted, threatened or*

endangered species and other forms of marine life". To give effect to this binding commitment to protect and preserve the marine environment, the ISBA is required to adopt and implement measures for the protection and preservation of the marine environment in the Area. The ISBA is currently developing regulations for future mining of massive sulphides and cobalt crusts in the Area, including provisions to control and reduce the environmental impact of these activities. These regulations could include provisions to designate particular areas as sensitive no-mining areas, as well as establishing procedures for designation of further sites as they are identified in the future.

Moreover, the World Summit on Sustainable Development (WSSD, 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 (2002) endorses the Plan of Implementation adopted at WSSD and further calls for urgent and coordinated action to protect vulnerable benthic habitats.

Action required

In order to facilitate a spatial and temporal separation of incompatible activities, and to minimise potentially unsustainable human disturbance in these rare and sensitive ecosystems, it is proposed to designate the Logatchev vent field as no-mining site. As a first step, the need for effective implementation of conservation measures in certain areas of the High Seas and the Area should be acknowledged. 2 - Pilot case studies, for example on the case of Logatchev, should be instrumental to developing management schemes, identifying stakeholders, responsibilities, cooperation and coordination and enforcement. 3 - A framework agreement, e.g. on a regional basis, will secure the international commitment and buy-in prior to developing 4 - the hard law.

Text prepared by Stefanie Schmidt, Sabine Christiansen, Andrey Gebruk, Kristina Gjerde, David Leary

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