Management & Conservation proposal

The High Seas of Salas y Gómez and Nazca ridges

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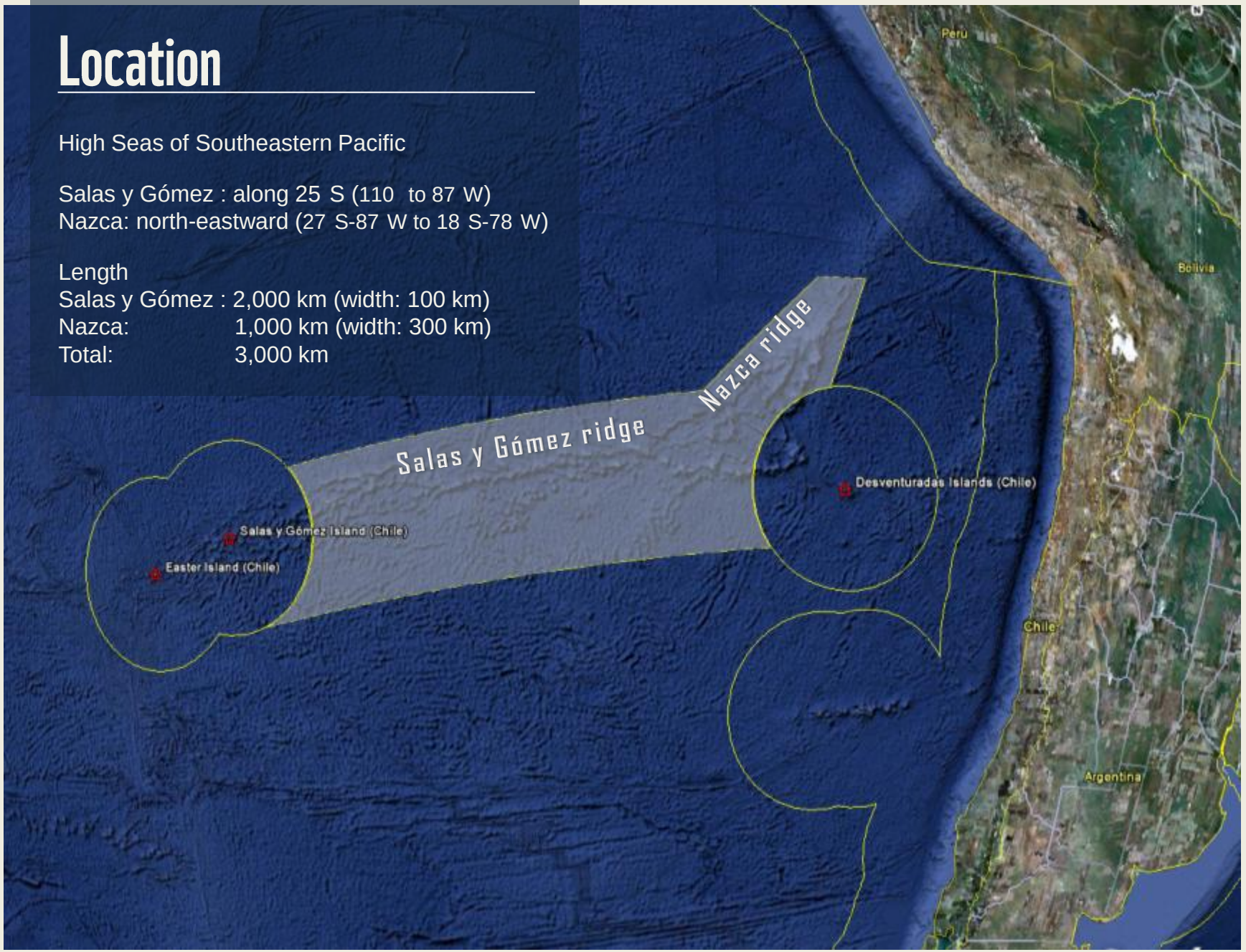
GOBI Annual Science Meeting
Aberdeen, 24-25 September 2011

Location

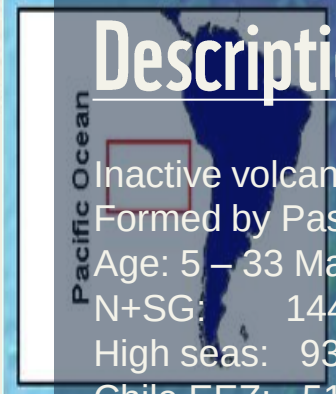
High Seas of Southeastern Pacific

Salas y Gómez : along 25 S (110 to 87 W)
Nazca: north-eastward (27 S-87 W to 18 S-78 W)

Length
Salas y Gómez : 2,000 km (width: 100 km)
Nazca: 1,000 km (width: 300 km)
Total: 3,000 km



Description



Inactive volcanic ridge
Formed by Pascua hotspot
Age: 5 – 33 Ma (Naar *et al*., 2002)
N+SG: 144 seamounts (height > 1000 m)
High seas: 93 seamounts (65%)
Chile EEZ: 51 seamounts (35%)
Summit depth < 750 m: 44%

Species Composition

Invertebrate and fish families, genera and species reported in 22 high seas seamounts of Nazca and Salas y Gómez

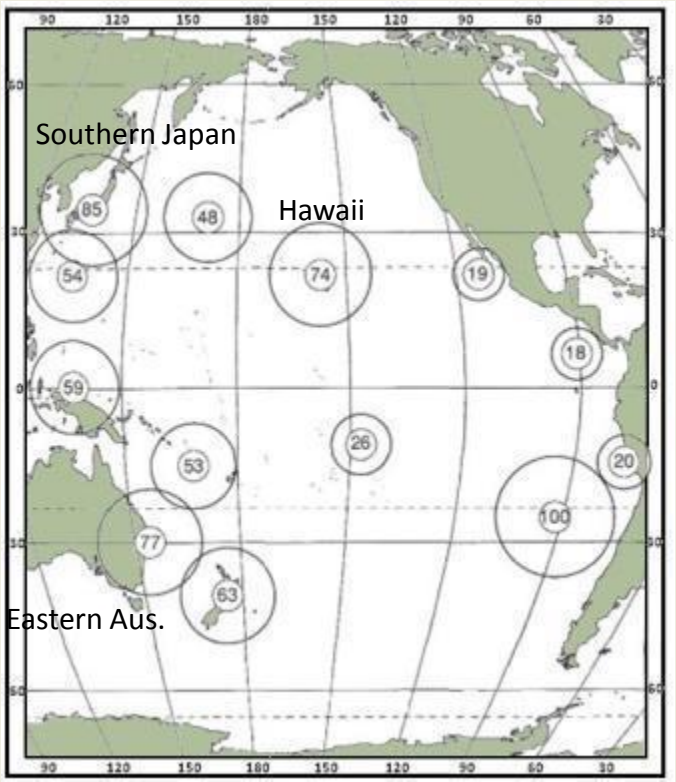
		Parin *et al.* (1997)	Mironov *et al.* (2006)
Invertebrate	Genera reported	177	**208**
	Invertebrate genera where the number of species is known	143 (192 spp.)	**180 (226 spp.)**
	Number of invertebrate genera represented by one species	117 (82%)	**142 (79%)**
Fish	Genera reported	128 (171 spp.)	**131 (170 spp.)**
	Families reported	64	**64**
	Number of fish genera represented by one species	106 (83%)	**109 (83%)**

Endemism & Biogeography

Extraordinary biodiversity
Very high endemism
Much more closely related to the Indo-West Pacific than to the eastern Pacific

Fish Order	No. families	No. species	No. endemic species
Anguilliformes	4	10	7 (70%)
Ateleopodiformes	1	1	0 (0%)
Aulopiformes	2	6	2 (33%)
Beryciformes	2	2	0 (0%)
Chimaeriformes	1	1	0 (0%)
Gadiforme	4	38	16 (42%)
Hexanchiformes	1	1	0 (0%)
Lophiiformes	3	3	2 (66%)
Myctophiformes	3	7	3 (43%)
Notacanthiformes	2	4	0 (0%)
Ophidiiformes	2	3	1 (33%)
Osmeriformes	3	10	3 (30%)
Perciformes	19	44	18 (41%)
Pleuronectiformes	2	5	3 (60%)
Polymixiiformes	1	2	2 (100%)
Scorpaeniformes	4	9	2 (22%)
Squaliformes	2	9	3 (33%)
Stomiiformes	2	4	4 (100%)
Syngnathiformes	1	2	0 (0%)
Torpediniformes	1	2	2 (100%)
Zeiformes	4	7	2 (29%)
Total	**64**	**170**	**70 (41.2%)**

(Parin *et al.*, 1997)



Percentage of fish genera in N&S-G occurring in other waters (Parin *et al.*, 1997)

Invertebrate	Nº of species	Endemic
Hyalospongiae	6	2 (33%)
Scleractinia	25	1 (4%)
Gastropoda Turridae	25	24 (96%)
Cirripedia	14	11 (79%)
Tanaidacea	9	2 (22%)
Macrura	29	10 (34%)
Brachiura & Anomura	24	10 (41%)
Bivalvia Septibranchia	7	7 (72%)
Brachiopoda	4	1 (25%)
Echinoidea	19	8 (42%)
Total	**164**	**76 (46,3%)**

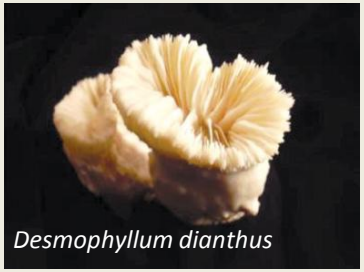
(Mironov *et al.*, 2006)

Deep Sea Corals

25 species of Scleractinias and 3 genera of Antipatharia recorded. Gorgonaria have also been found. *Pocillopora* and *Porites* genders are abundant in shallow waters ♣ (<50 m).

Teresa Zubi ©

Woods Hole Ocean. Inst. ©



Alejandro Bravo, UACh ©

USGS Open-file report 2008-1148

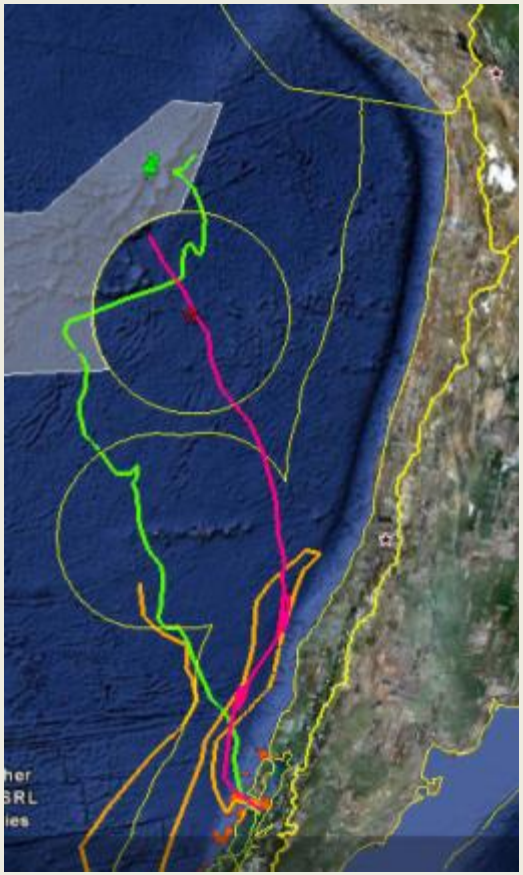
Family	Gender	Species
Antipathidae	*Antipathes** *Bathypathes* *Cirripathes*	
Caryophylliidae	*Caryophyllia*	*calveri*, *diomedea*, *perculta, rugosa*, *solida*
	Conotrochus	*funicolumna*
	Crispatotrochus	*galapagensis*
	Deltocyathus	*andamanicus*, *stelluatus*, *vaughani*
	Desmophyllum	*dianthus*
	Paracyathus	*humilis*
Dendrophylliidae	*Dendrophyllia*	*gracilis*
	Enallopsammia	*rostrata*
Flabellidae	*Flabellum*	*apertum*
	Javania	*cailleti*
	Polymyces	*wellsi*
Fungiacyathidae	*Fungiacyathus*	*paliferus*, *pliciseptus*, *stephanus*
Guyniidae	*Stenocyathus*	*vermiformis*
Oculinidae	*Madrepora*	*oculata*
Turbinoliidae	*Idiotrochus*	*kikutii*
	Peponocyathus	*australiensis*, *orientalis*

(♣: NatGeo y Oceana, 2011)

(Source: SeamountOnline, 2007; * Molodtsova, 2005)

Endangered Species

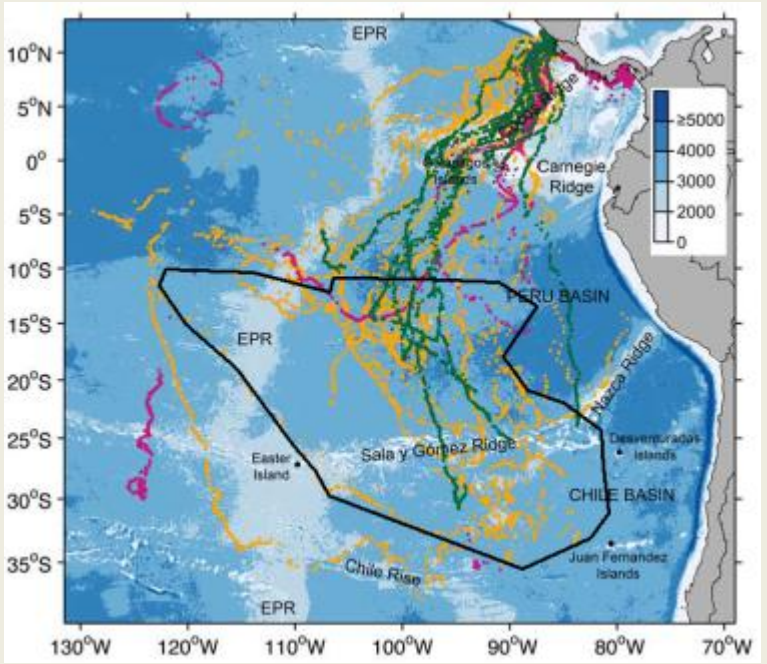
Nazca is the likely reproductive area for southern blue whale population. Salas y Gómez is part of a foraging area for leatherback turtles



Blue whale

(Source: Hucke-Gaete and Mace, 2004)

Leatherback turtle

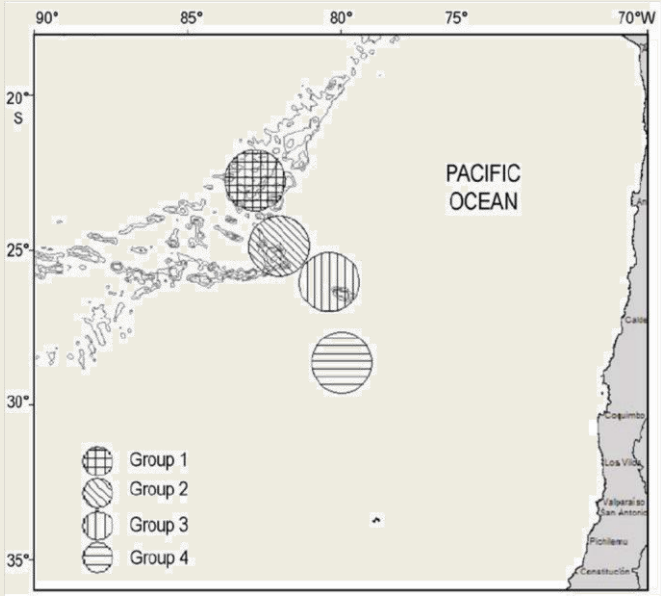


(Source: Shillinger *et al*., 2008)

Commercial Species

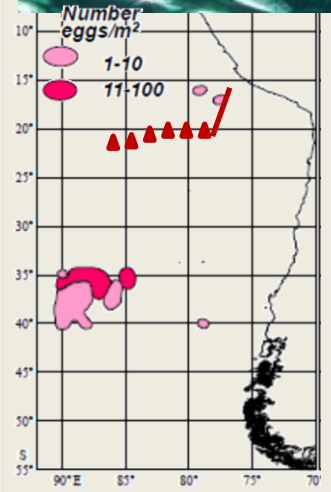
Nazca ridge functions as recruitment and nursery areas for swordfish. It contains a small spawning area and is nursery zone for Chilean jack mackerel.

Swordfish

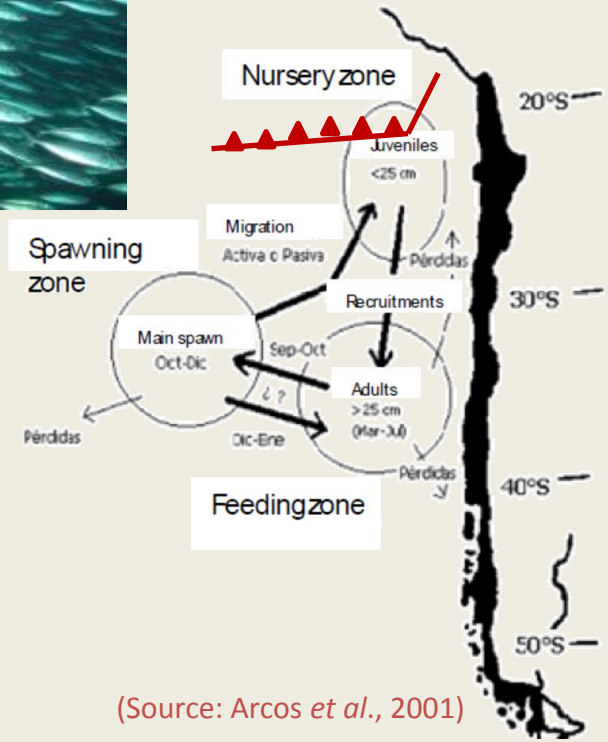


(Source: Yañez *et al*, 2004; 2009)

Jack mackerel



(Source: Nesterov, 2001)



(Source: Arcos *et al*., 2001)

Why is this important?

Significant areas for marine biodiversity, endangered species and, fisheries sustainability.

EBSA´s criteria	WWF	Dunstan et al.
C1 – Uniqueness or rarity	Low ←	Low
C2 - Special importance for life-history stages of species	High* ←	Low
C3 - Importance for threatened, endangered or declining species and/or habitats	High ←	High
C4 - Vulnerability, fragility, sensitivity, or slow recovery	High ←	High
C5 - Biological productivity	Medium** ←	Low
C6 - Biological diversity	High*** ←	Medium
C7- Naturalness	High ←	High

Based on: Dunstan, P.K. Clark, M.R., Guinotte, J., O'Hara, T., Niklitschek, E., Rowden, A.A., Schlacher, T., Tsuchida, S., Watling, L., Williams, A. (2011). Identifying Ecologically and Biologically Significant Areas on Seamounts. Gland, Switzerland: IUCN. 14pp. [http://data.iucn.org/dbtw-wpd/edocs/2011-056.pdf].

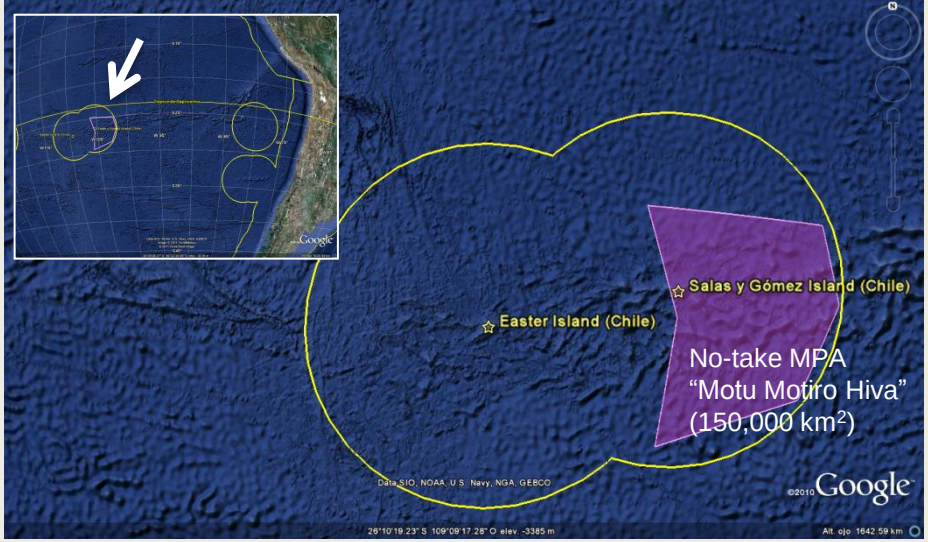
* Modified by the authors considering the special importance for blue wale, leatherback turtles and jack mackerel.

** Modified by the authors based on oceanography studies carried out by Chilean scientists.

* ** Modified based on recent findings of National Geographic & Oceana (2011).

Recent studies

National Geographic Society and Oceana, in collaboration with Chilean Navy, carried out scientific cruises around Eastern Island and Salas y Gomez Island in Feb-Mar 2011.



Fishes	No. species	% species	Abundan-ce (%)
Endemic	17	**27.4**	31.25
Regional endemism	8	12.9	43.75
No endemic	37	59.7	25.00
Total	**62**		

Figura 21. Ejemplos de peces endémicos observados en Salas y Gómez e Isla de Pascua. A. Kototi para (Centropyge hotumatua), B. Tipi tipi'uri (Chaetodon litus), C. Mamata (Chromis randalli), D. Mamata (Chrysiptera rapanui). (Fotos: A y C de Randall y Cea 2011).

Source: National Geographic y Oceana . 2011. Expedición a Isla de Pascua y Salas y Gómez. Febrero – Marzo 2011. Informe científico, 58 pp.

Main threat to biodiversity

"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 […] declined following the destruction" (Parin *et al*., 1997: 178)

Potential Resources


Red gurnard perch


Robust cardinalfish


Armourhead


Silvery John dory


Golden crab

Countries have fished


Chile


Russia


Ukraine

Catch (ton/year) of **bottom trawl fisheries**, by specie, in Nazca and Salas y Gomez

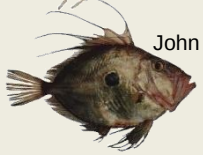
	1979	1980	1981	1982	1983	1984	1988	1989	1991
Beryx spp.	907	12	676	620	633	458	-	-	-
Emmelichthyidae	-	-	-	-	-	-	98	36	-
P. bahamondei	-	8	4	-	-	-	-	-	(*)
Zeus faber	-	-	-	-	-	-	-	-	-
	1992	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2005**	
Beryx spp.	-	144	-	-	-	2	11	5	
Emmelichthyidae	-	-	-	-	-	-	-	-	
P. bahamondei	(*)		22	5	1	-	-	-	
Zeus faber	-	-	5	-	-	-	-	-	

(the authors, based on several sources)


Alfonsino


Redbait


Chilean lobster


John dory

Objectives for the area

Devoted to conservation of marine biodiversity, protection of endangered species and fisheries management.

For Conservation it may:

- Contribute to protect our **global marine heritage** for future generations.
- Protect **unique seamount communities** from adverse fishing impact.
- Protect key **biological process** (i.e. reproduction, foraging) for **endangered species** like *blue whales* and *leatherback turtles*.
- Provide **reference sites** for future scientific research and public education.
- **Improve resilience** to the accelerating impacts of climate change.

For Fisheries it may:

- Protect critical life stages for fishes as the basis for very important commercial fisheries like *swordfish* and *jack mackerel* (spill-over grounds).
- Ensure the long term recovery and maintenance of populations of highly mobile and migratory fishery resources.

Potential measures

Potential measures to be analyzed must comprise from no-take MPAs to temporary closures.

For Conservation:

- No-take Marine Protected Areas (EBSAs).
- Maritime traffic regulations (Sensitive areas)
- Permanent closures for bottom-contacting fishing gears (VME).
- Bycatch excluder/preventer devices.
- Ban to deepsea mining

For Fisheries Management:

- Move-on rules (VME).
- Temporary closures.
- Selective fishing devices.
- Minimum fish-size.

General:

- Observers on board.
- VMS and standard MCS measures.

Possible implementation

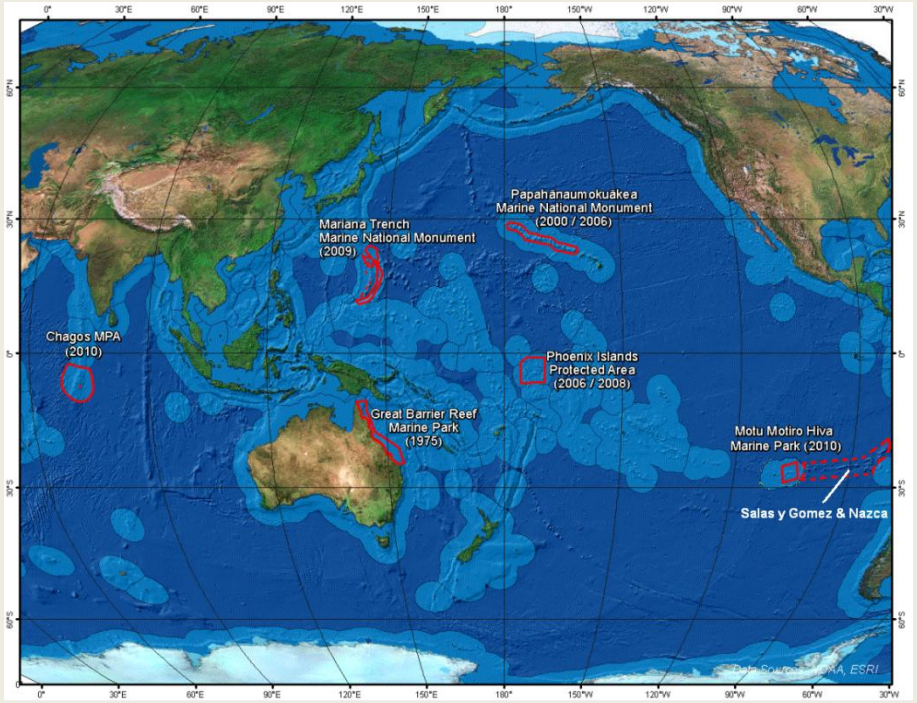
Due to the nature of governance of the high seas, a coordinated and integrated international approach is needed.

Proposed further steps:

1. Recognition as (**EBSAs**) in the framework of the Convention on Biological Diversity (**CBD**).
2. Acceptation as **VMEs** based on **FAO** criteria and guidelines.
3. Campaign by **WWF** and the High Seas Alliance (**HSA**) at relevant fora.
4. **Chilean Government** is a champion at the **South Pacific RFMO**.
5. Endorsement by the Permanent Commission of South Pacific (**CPPS**).
6. Costa Rica/Colombia/Ecuador/Peru is a champion at the Inter-American Tropical Tuna Commission (**IATTC**).
7. Champions request special measures at the International Seabed Authority (**ISA**), the International Whaling Commission (**IWC**) and the International Maritime Organization (**IMO**).
8. Implementation of coordinated conservation and management measures by relevant international organizations and RFMOs (SP-RFMO & IATTC).

Constrains & challenges

In spite of the lack of integrated governance at the high seas, there is a window of opportunity if political willingness and international coordination is built.



- Political will, political will, political will and,
- Effective coordination of multiple jurisdictional authorities and stakeholder roles, interests, and collective responsibilities.

- Effective site surveillance and enforcement;
- Investment in education, research and monitoring, communication and outreach;
- Adequate resources, including funding and increased management capacity; and,
- Appropriate public access to the site (remote oceanic location).

Based on: Big Ocean. 2010. Network of the World s Large Scale Marine Managed Areas. Communiqué. Available: http://www.bigoceanmanagers.org/sites/default/files/docs/pdf_docs/big_ocean_communique_FINAL.pdf

How others did it

2008, OSPAR Contracting Parties agreed to establish the first high seas MPA in the Northeast Atlantic – the Charlie Gibbs Fracture Zone – with a view to making it legally binding and operational at its 2010 Ministerial Meeting.

OSPAR Ministers have established **6 MPAs** covering a total area of 285,000 km^2 protecting a series of seamounts and sections of the Mid-Atlantic Ridge and hosting a range of vulnerable deep-sea habitats and species. Four of the MPAs have been established in collaboration with Portugal.

Acknowledgements:

This conservation proposal was developed with the collaboration of **Christian Neumann**. Thanks to **Jessica Battle** (WWF Int) and **Stephan Lutter** (WWF Germany) for their comments and suggestions. Dr. **Carlos Gaymer** (Universidad Católica del Norte) provided useful information and photos of slide 10.

This presentation was possible thanks to financial support of **GOBI** and **WWF Sweden**.

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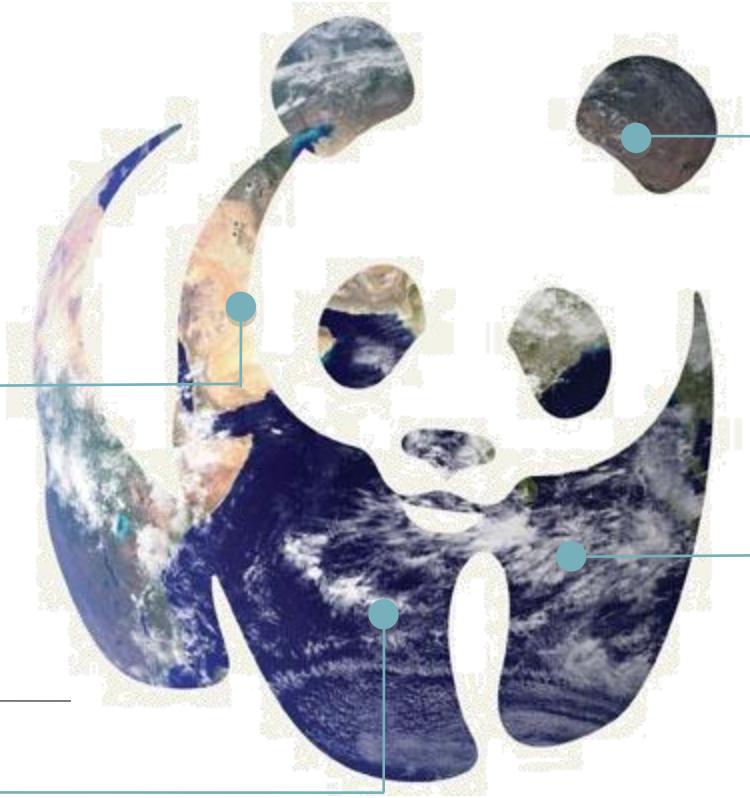
WWF IN SHORT



+100

WWF is in over
100 countries, on
5 continents

+5,000

WWF has over
5,000 staff
worldwide

1961

WWF was founded
In 1961

+5M

WWF has over
5 million supporters

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