National Plan of Action for the Conservation of Albatrosses and Petrels

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National Plan of Action for the Conservation of Albatrosses and Petrels

(NPOA-Seabirds Brazil)

Threatened Species Series Number 2

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Summary

List of acronyms

ACAP	Agreement on the Conservation of Albatrosses and Petrels
APA	Environmental Protection Area (a category of a Protected Area in Brazil)
AVIDEPA	Vila-Velhense Association of Environmental Protection (a NGO established at Espírito Santo State, Brazil)
CBRO	Brazilian Committee of Ornithological Registers (Working Group linked to the Brazilian Society of Ornithology)
CCAMLR	Commission for the Conservation of Antarctic Marine Living Resources
CEMAVE	National Research Center for the Conservation of Wild Birds/IBAMA
CEPENE	Research and Management Center of Fisheries Resources of the Northeast Coast/IBAMA
CEPSUL	Research and Management Center of Fisheries Resources of the Southeast and South/IBAMA
CGEUC	Protected Areas Coordination/IBAMA
CGFAU	Fauna General Coordination/IBAMA
CIRM	(Brazilian) Inter-Ministerial Commission for the Marine Resources
CMS	Convention on Migratory Species
COFAU	Fauna Species Protection Coordination/IBAMA
COFI/FAO	Committee on Fisheries/FAO
CONEPE	National Council of Fisheries and Aquiculture (A council of fisheries industries)
CPUE	Capture per Unity of Effort
DEMA/MRE	Environment Department/MRE
DEPAQ	Fisheries and Aquiculture Department/IBAMA (Extinct)
DEVIS	Wildlife Department/IBAMA (Extinct)
DIREC	Ecosystems Directorate/IBAMA
DIREN	Natural Resources Directorate/IBAMA (Extinct)
DPA	Department of Fisheries and Aquiculture/Ministry of the Agriculture (Extinct)
EEZ	Exclusive Economic Zone
FAO	Food and Agriculture Organization of United Nations
FURG	University of Rio Grande
FV	Fishing vessel
GEREX	Executive Manager/IBAMA
IBAMA	Brazilian Institute of Environment and Natural Renewable Resources (subordinated to MMA)
ICCAT	International Commission for the Conservation of Atlantic Tunas
IFSP	Forestry Institute of São Paulo (subordinated to the Government of São Paulo State)
IN	Normative Instruction (Legal instrument of normalization published by a Federal body)

INFRAERO	The Brazilian Company of Airport Infrastructure (subordinated to the Ministry of Defense)
IPOA-Seabirds	International Plan of Action for the Reduction of the Incidental Capture of Seabirds in Longline Fisheries
IPSP	Fisheries Institute of São Paulo (subordinated to the Government of São Paulo State)
IUCN	The World Conservation Union
MMA	Ministry of the Environment (of Brazil)
MNRJ	National Museum of Rio de Janeiro
MRE	Foreign Affairs Ministry (of Brazil)
MZUSP	Museum of Zoology/USP
NGO	Non-Governmental Organization
NMFS	National Marine Fisheries Service (of USA)
PARNA	National Park (a category of a Protected Area in Brazil)
PROFROTA	National Program of Funding to the Improvement of the Brazilian Fishing Fleet
REVIZEE	Evaluation of the Sustainable Potential of the Living Resources in the Brazilian Exclusive Economic Zone (a Program coordinated by the Ministry of Environment)
RV	Research Vessel
SCRS	Permanent Committee of Researches and Statistics/ICCAT
SEAP	Special Secretariat of Aquiculture and Fisheries of the Presidency of the Republic (of Brazil)
SPU	National Patrimony Secretariat (subordinated to the Ministry of Planning)
STWG	Seabird Technical Working Group
TAMAR	National Center for the Conservation and Management of the Marine Turtles /IBAMA
UC	Conservation Unit (=Protected Area)
UFRPE	Federal Rural University of Pernambuco
UFS	Sergipe Federal University
UNISANTOS	Santos Catholic University
UNIVALI	University of Vale do Itajaí
USP	University of São Paulo

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History of the Conservation of Procellariiformes in Brazil

In June 1997, the researcher Fábio Olmos sent a correspondence to the IBAMA Presidency, informing the problems of the incidental seabirds' mortality during fisheries operations using longlines, alerting them about the possibility of the adoption of economic sanctions against countries that did not adopt mitigation measures to avoid seabirds' capture.

During the previous IBAMA's structure, an exchange to deal with this matter had started between DEPAQ, linked to DIREN and DEVIS, which was linked to DIREC. In July 1998, Mr. Carlos Fisher, a representative of DEPAQ, after consulting the researcher Tatiana Neves, attended a preparatory meeting for FAO consultations, in Rome. In that occasion, it were discussed subjects such as the management of the sharks fisheries capacity and incidental capture of seabirds by the longline fisheries, which resulted, in 1999, in the adoption of the International Plan of Action for Reducing Incidental Capture of Seabirds in Longline Fisheries (IPOA-Seabirds). The FAO country members should elaborate national plans of action to reduce such mortality.

After this meeting, DEPAQ's representative requested from the researchers T. Neves and Carolus Maria Vooren the elaboration of a diagnosis concerning the seabirds' capture in the longline fisheries, according to the orientation of the IPOA-Seabirds.

In June 1999, the representative of DEVIS and CEMAVE/IBAMA, Mrs. Maria Carolina Hazin, attended a meeting of the working group created by the coordinator committee of the Valdivia Group (regarding to the cooperation agreement for migratory species), to discuss a proposal of a regional agreement to protect the albatrosses, in the light of the Convention on Migratory Species.

IBAMA (CEMAVE, DEVIS and DEPAQ) promoted, in June and August of 2000, meetings with the researchers F. Olmos, T. Neves and Jules Soto, to discuss these subjects. Iolita Bampi, the Coordinator of DEVIS, aware of the Brazilian responsibility, requested from the researches T. Neves and F. Olmos the elaboration of a national plan of action aiming the seabirds conservation.

In July 2000, the researcher T. Neves was indicated by IBAMA and MRE to represent Brazil in the 2nd preparatory meeting for the Agreement on the Conservation of Albatrosses and Petrels - ACAP, carried out in Hobart, Australia. During that meeting, the researcher established contacts with the Chief of the COFI/FAO, Mr. John Valdemarsen, in order to get financial support for the elaboration of the Brazilian plan of action.

Still in 2000, the following activities were accomplished: (1) some training trips for voluntary observers on fishing vessels, organized by Projeto Albatroz; (2) a Technological Fomentation Scholarship, through DEPAQ (Specialist Guest modality), in the scope of the REVIZEE Program, for the researches T. Neves and M.C. Hazin, in order to accomplish studies related to the seabirds' accidental captures by fishing gears, respectively, in the south and north of the Brazilian coast, between November 2000 and January 2001; (3) DEVIS sent to FAO a project written by T. Neves and F. Olmos, aiming the elaboration of a national plan of action; (4) In July 2000, CEMAVE carried out, in conjunction with UNIVALI, a course denominated Research Techniques for the

Conservation of Wild Birds, with emphasis in the Procellariiformes; and (5) the oceanographer Alexandre Filippini, CEMAVE's project executor in Santa Catarina State, elaborated a research project entitled "Evaluation of the Procellariiformes' mortality in longline oceanic fisheries in the South of Brazil".

In December 2000, a meeting was held between the Heads of CEMAVE, DEVIS and the First Secretary of the Environment Division of the MRE to discuss the Brazilian proposal for the meeting of the ACAP, to which Brazil had adhered in June 2001.

In July 2001, during a meeting in Curitiba, State of Paraná, between representatives of CGFAU, CEMAVE, IFSP, CBRO, IPSP, UNIVALI, CEPSUL and Universitary Center São Camilo/SP, the subject was discussed and it was proposed the realization of a workshop and the creation of a Working Group by IBAMA.

In September 2001, CEMAVE's Head, João Luiz Xavier do Nascimento, along with the researcher T. Neves, in that occasion representing the Projeto Albatroz, represented IBAMA in the first Taller Sudamericano sobre Conservación de Albatrosses y Petreles, promoted by BirdLife International and Aves Uruguai, in Punta del Este, Uruguay.

On October 24th and 25th 2001, at CEMAVE, in Brasilia, it was held the first Brazilian Workshop on the Conservation of Seabirds, where the main theme was the problem of the albatrosses and petrel's mortality in longline fisheries.

In April 2003, the Albatross Institute was created, and immediately received resources from FAO to the elaboration of the National Plan of Action for the Conservation of Albatrosses and Petrels (PLANACAP, in Portuguese; =NPOA-Seabirds Brazil). The work was accomplished together with Projeto Albatroz and BirdLife International - Brazilian Program, and submitted to IBAMA. The final document, in Portuguese version, was delivered to the sponsoring organization, FAO.

In December 2003, in an international workshop organized by BirdLife International and FAO at Futruno, Chile, the Projeto Albatroz presented the NPOA-Brazil for the scientific community of South America.

In April 2004, IBAMA and Projeto Albatroz carried out a workshop to discuss the NPOA-Seabirds Brazil, in Guarujá, São Paulo. It was the first meeting of the Working Group, formerly created by IBAMA by the IN IBAMA n° 55/04-N, from June 1st, 2004.

In October 2004, the researcher T. Neves presented the executive version of the NPOA-Brazil in the meeting of the group ad hoc WG-IMAF (Working Group for the Fisheries Incidental Capture of CCAMLR), during the XXIII CCAMLR Meeting, in Hobart, Australia.

Between November 8th and 12th, 2004 the first meeting of the ACAP parties took place in Hobart, Australia, where Br4azil was represented by the Fauna Species Protection Coordinator, Onildo João Marini Filho and by the Secretary of the Brazilian Embassy at Australia, Roberto Parente. In that occasion, it was achieved a reduction of the contributions from developing countries, among them Brazil, what enabled its adherence to the Agreement.

In July 2003, despite the fact that the ACAP was not ratified, Brazil sent, for the fist meeting of the Consulting Council, a document elaborated by O.J. Marini Filho, T. Neves and Leandro Bugoni, entitled Voluntary Brazilian Report about the Implementation of the Plan of Action of ACAP, which was also presented to CCAMLR, in October 2005.

During 2005, the NPOA-Seabirds Brazil went through several revisions and updating, under the supervision of COFAU, with the objective to make the text more consistent with the actions relating to the fisheries sectors, making possible the present publication.

Presentation

Brazil is the country that has the world's greater biodiversity. At the same time, the increase of the human activities, such as the unordered expansion of the cities and the increase of the agricultural borders over the preserved areas resulted in a great pressure over several landscapes and biomes in Brazil. The main consequences of these actions are the loss, degradation and fragmentation of habitats, resulting on an increase of the number of species in the Official List of Threatened Species instituted by the Normative Instruction (IN) Nº 3 of the Ministry of the Environment, of May 27, 2003.

Every Brazilian citizen is responsible for watching over this national patrimony, but the initiatives and measures to be adopted in order to reverse this scenario must be undertaken in an organized and cooperative way for a common objective. Therefore, gathering the efforts from governments, society, and research institutions, aiming the conservation of our biodiversity, represents an important step of this endeavor.

In order to change this threat scenario, the Brazilian Institute of Environment and Natural Renewable Resources and the Ministry of the Environment created the Threatened Species Series, composed by Action Plans and other relevant contributions to the protection and conservation of the Brazilian threatened fauna. The first number of this Series referred to Red-billed Curassow *Crax blumenbachii*.

The second number of this series is the National Plan of Action for the Conservation of Albatrosses and Petrels, seabirds´ species that remain most part of their lives in open sea, searching for land only during the reproduction, which generally occurs on oceanic islands. The two main threats to them are the industrial fishery which uses longlines, and the alteration of the breeding areas, due to the introduction of invading exotic species.

The Plan presents information about the biology of this particular group, identifies the threats that it is facing and proposes measures that must be implemented, identifying potential actors and establishing time scales and priorities for long term conservation of these species. The Plan must be revised periodically, to monitor and evaluate the success of the actions undertaken and to update the conservation needs.

We thank all the participants and sponsors that collaborated for the elaboration of this Plan on all the phases of preparation, showing commitment with the conservation of the Brazilian biodiversity.

MARCUS LUIZ BARROSO BARROS
President
Brazilian Institute of Environment and Natural Renewable Resources

JOÃO PAULO RIBEIRO CAPOBIANCO
Secretary of Biodiversity and Forests
Ministry of the Environment

Gathering efforts for the conservation of seabirds

The idea of an International Plan of Action to reduce the seabirds' incidental capture was first launched by the COFI's members, in 1997, aiming to establish an international agreement which attended the issues pointed at the Conduct Code for Responsible Fisheries. The voluntary adoption by the FAO's country members was elected the most suitable tool for the development of this Plan. The text was elaborated during two intergovernmental meetings held in 1998, and finally adopted during the 23rd COFI Session, in February 1999 and endorsed by the FAO Council in June of the same year.

By accepting the International Plan, Brazil adopted, voluntarily, the responsibility to develop its own national plan of action. Since then, several sectors commenced to organize the accomplishment of this important task, which involved governmental areas, private companies and NGOs, as this work was so complex that demanded the participation of many different actors such as the productive sector as well as the environmental entities.

Supported by FAO, the Projeto Albatroz and BirdLife International - Brazilian Program, elaborated a diagnosis about the conservation of albatrosses and petrel's species in the national territory and its relation with the fisheries. Both institutions, which are involved with this group of seabirds for over a decade, maintain in their databases historical information concerning the interaction of the seabirds with the fisheries. These pioneers also allowed an approximation with the fisheries sector, especially with the skippers and crew members, what generated a valuable apprenticeship about the close relationship that exists between these men and the ocean, and it helped on the choice of the approach to be adopted to the implementation conservationist actions.

The fishermen, supported by the fisheries company owners were, in many cases, receptive to the information about the importance of the conservation of seabirds, biodiversity and the marine environment in general. This fruitful relationship had results unimaginable, like the voluntary adoption of mitigation measures and the effective change of behavior of the fishermen concerning the environmental questions. The albatrosses became icons of this new attitude, showing us that the handling of issues apparently unsolvable is, in fact, feasible.

Stimulated by these movements, the Government became more participative and interested in facing this question. IBAMA, which has been directly involved in this question for many years, consolidated its position as the entity responsible for this theme, carrying out a workshop for the discussion of the National Plan of Action for the Conservation of Albatrosses and Petrels (NPOA-Seabirds Brazil). The SEAP, in a pioneer action, determined the use of the mitigation measures in order to avoid seabirds' and marine turtles' capture by the leased fleet (Decree n° 4.810, from 19 of August of 2003) and has is working to normalize the National Program of Observers, in partnership with the MMA and IBAMA, since it foresees the study of the interactions between seabirds and other organisms with the fishing gears. In the state level, the Environment Secretariat of the State of São Paulo, through IFSP, created the Program for the Conservation of Albatrosses and Petrels - PROCAP, working jointly with Projeto Albatroz, since its creation, in February 2002.

Coming from different parts of Brazil, 35 representatives from MMA, IBAMA, SEAP, IFSP, Projeto Albatroz, BirdLife International - Brazilian Program, fisheries industries, CONEPE and universities gathered in the April 5-6th, 2004 at Fortaleza de Santo Amaro da Barra Grande, in Guarujá, São Paulo to participate of a workshop to discuss the NPOA-Seabirds Brazil.

During this meeting, the discussions were focused on the management and research of the resident species (activities to the preservation of the breeding sites in the Brazilian oceanic islands) and migratory species (focusing on the interaction of seabirds with fisheries activity).

The Trindade Islands (Fig. 1) and Martin Vaz (at the Espírito Santo coast), Itatiaia (Vila Velha, Espírito Santo State) (Fig. 2) and the Fernando de Noronha Archipelago (Pernambuco State) (Fig. 3) where the key points in the discussion, because these are the only breeding sites of the two species of petrels that breed in national territory: the Audubon's Shearwater *Puffinus lherminieri* and Trindade Petrel *Pterodroma arminjoniana*, endemic from the Trindade Islands and Martin Vaz. The main discussions focused the management of these areas, specially regarding the risks of introducing predators (such as rats) by the activities of vessels coming along side the islands and the disembark. Eradication measures for introduced predators (especially in Fernando de Noronha), the restoration of natural habitats and the implementation of mechanisms to avoid the development of activities that are harmful to the seabird population were proposed. It was also suggested the development of research on the possible occurrence of reproductive activities of other species in the islands as well as the interaction with the fisheries.

Cesar Musso

Fig.1 - Trindade Island

Cesar Musso

Fig. 2 - Itatiaia Islands, Vila Velha city, Espírito Santo State coast

Cesar Musso

Fig. 3 - Sancho Bay with Dois Irmãos Island on the back, Fernando de Noronha Archipelago

Another issue that had consensus on the discussions was the inclusion of the Brazilian Navy, the CIRM and the MNRJ as participants in all the actions related to Trindade and Martin Vaz Islands, as well as the inclusion of Pernambuco State Government in the actions related to Fernando de Noronha.

Though, the incidental capture of albatrosses and petrels by the oceanic fisheries, especially those accomplished by the pelagic longlines, was the central question that stimulated the elaboration of the NPOA-Seabirds Brazil. The participation of the several sectors in the discussion was very productive. It was focused on four lines of action: (1) the development of educational activities, especially to fishermen on board; (2) the normalization of the mandatory use of mitigation measures on board of the vessels based in national territory, in order to avoid the incidental seabirds' capture; (3) the establishment of incentives to the adoption of such measures, like an environmental fisheries certification; and (4) Monitoring the adoption of these measures through the onboard observers program.

All these efforts resulted in the elaboration of a document including all the questions related to the involved species and its interaction with the fisheries, as well as the use of mitigation measures in Brazil. The objective of the compilation of this information is to provide and updated instrument for all sectors involved with the problem.

The diagnosis is a base for the comprehension of the objectives of the second part of the document, which is composed by goals and actions that represent the national strategy to the question. By publishing this Plan, Brazil is honoring the commitment made with FAO and other fishery nations, conducting with determination and seriousness the works towards the conservation of albatrosses and petrels, as well as assuring the maintenance of these species in Brazil and in the world.

Tatiana Neves
Fábio Olmos
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Leonardo Mohr

Recommendation

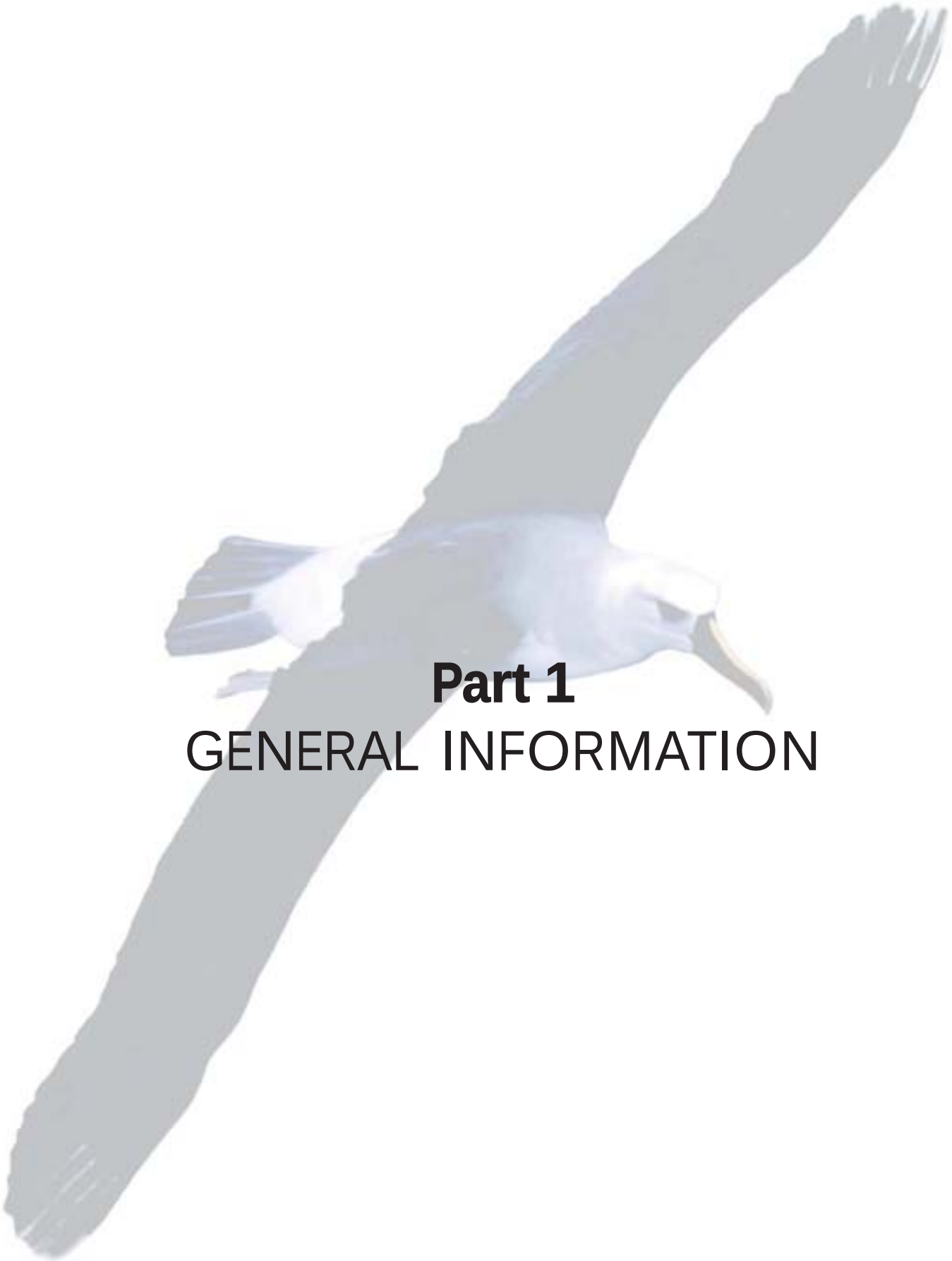
Ratification of the Agreement for the Conservation of Albatrosses and Petrels

The Foreign Affairs Ministry – through its Environment Department (focal point for this issue) and the Brazilian Embassy in Australia – after the preparatory meetings in Hobart (Australia) and Cape Town (South Africa), signed in June 2001 the Agreement for the Conservation of Albatrosses and Petrels – ACAP.

Australia, New Zealand, Equator, Spain and South Africa ratified the ACAP, reaching the minimum number of participants to put in force, what happened on February 1st, 2004. After this, the Agreement was ratified by the United Kingdom.

Brazil, Argentina, Chile, France and Peru signed the ACAP, but in these countries the Agreement is under ratification process.

The participants of the Workshop for the discussion of the National Plan of Action for the Conservation of Albatrosses and Petrels **recommend** that Brazil – through its Foreign Affairs Ministry, who is conducting an intergovernmental consultation on this issue – **promotes the ratification of the ACAP as soon as possible**.



Part 1
GENERAL INFORMATION

Introduction

Threats to Procellariiformes

Seabirds, in general, are very vulnerable to the predation during the reproductive period, therefore, many species depend on the insular habitats to nest, in which terrestrial predators, especially mammals, are absent. The introduction of predators like rats, cats, pigs and dogs, as well as herbivores, that destroy the vegetation causing erosive processes (like goats), have been exterminating the seabirds' colonies all over the world, threatening the species or leading them to extinction. The introduction of exotic species is one of the major problems to a considerable number of threatened seabirds.

Another threat factor to the seabirds is resulting of their feeding habits. Several species, besides predating fish and cephalopods, capture these weak or dead preys at the water surface, such as agonizing post-reproduction squids or animals discarded by the larger fish or marine mammals. This remarkable behavior between the Procellariiformes makes them pre-adapted to supplement their diet using the fisheries discards, as well as to attempt to capture the baits from the hooks. Therefore, such species interact with the fishing vessels, and many times they are incidentally captured by the longline fisheries and by other fishing modalities.

The longline vessels may set in the water from 800 to 4,000 hooks/day, depending of the fishing modality. During the longline settings, the baited hooks may not sink quickly and food is then available to the seabirds that follow the vessel after food. The seabirds get captured by the hooks and sink with the equipment and many die by drowning (Fig. 4).

Guy Marcovaldi

Fig. 4 - Tristan Albatross *Diomedea dabbenena* hooked and killed by drowning

Some kinds of longliners, used for Dolphin Fish (*Coryphaena* spp.) capture, may allow the seabirds to stay at the surface, but they are victims of lesions- mostly fatal - caused by swallowing the hooks or during hauling of the equipment by fishermen. Although, in minor proportion, there are also some captures during the longline hauling operation.

The seabirds' mortality, especially albatrosses and petrels, associated to the longline fisheries has been recognized as a serious threat to these birds in the last 25 years. During this period there was a significant increase of the fisheries effort by the longline vessels dedicated to the capture of larger predator fish. This increment on the fisheries is associated to a significant decline on the population of seabirds' species incidentally captured. For example, a recent estimate made by CCAMLR indicates that the bottom longline fishery targeting the Patagonian Tooth Fish (*Dissostichus eleginoides*) had killed about 250,000 seabirds, in three years (Brothers et al., 1999).

Pioneer studies performed in the 1980's, including leg bands recuperation analyses by fishing vessels (Croxall & Prince, 1990), identified the longline fisheries as a serious problem for the conservation of albatrosses and other seabirds. Labeled "environmental friendly", when compared to techniques such as trawl net or gillnet, nowadays it is well known that the longline fisheries is a significant mortality factor for seabirds, marine turtles and non-commercial fish.

Most species of Albatrosses and Giant Petrels are in decline because - at least in part - of the mortality caused by the longline, which also threatens species of the genus *Procellaria* (Barnes et al., 1997; Ryan, 1998). The number of Wandering Albatross *Diomedea exulans* observed at the Indian Ocean has decreased 99% between 1981/82 and 1992/93, while the decrease of the Black-browed Albatross *Thalassarche melanophris* (Fig. 5) and the Southern Giant Petrel *Macronectes giganteus* was 100-98%, respectively (Woehler, 1996). The population of the three species of albatrosses that nest on the sub-Antarctic islands of South Georgia (*D. exulans*, *T. melanophris* e *T. chrysostoma*) declined more than 30% since 1976 (Croxall et al., 1998). In fact, few populations of albatrosses and giants petrels are stable, and all the species are considered globally threatened while some are classified as Endangered, like the Tristan Albatross *Diomedea dabbenena* (Croxall & Gales, 1998; Gales, 1998; BirdLife International, 2004; IUCN, 2004).

Fábio Olmos

Fig. 5 - Black-browed Albatross *Thalassarche melanophris*

Facing the problem globally

In the 1990's, it was clear that the seabirds' mortality caused by the longline fisheries was a global question and could only be discussed on the international level. This understanding generated several initiatives by governments, NGOs and multilateral agencies, including organizations related to the fisheries management. In October 1996, during the first session of the IUCN World Conservation Congress, in Montreal, a group of NGOs obtained the approval of a resolution that required a coordinated action for the reduction of seabird's mortality. This

resolution, supported by the IUCN country members, except Japan, exposed the problematic on the international level.

To support this initiative, at the 22nd COFI Session, held in Rome, in March 1997, it was requested a consultation with regional specialists - governmental and non-governmental - with the objective to propose guidelines for an action plan for the reduction of the incidental mortality of seabirds. In a significant way, Japan was one of the two countries that were willing to organize this effort. At the same time, BirdLife International - an international NGO remarkably involved on the initiatives for bird' conservation, started an international program for the seabirds' conservation (Seabird International Conservation Program), with the main goal of obtaining the reduction of the incidental capture by the longline vessels.

Besides these efforts, during FAO's 28th Session in October 1995, the Code of Conduct for Responsible Fisheries was adopted. It established principles and patterns for responsible fishing practices, assuring the conservation, the management and the sustainable development of aquatic living resources. The article 7.6.9 of this Code stimulates the adoption of management measures to minimize the capture of non-target species and that not considered as fisheries resources, besides the development and use of selective and environmentally safe fishing techniques. This Code constitutes the basis for the initiatives for the seabirds' conservation supported by FAO.

In October 1998, representatives of FAO and of the Governments of Japan and United States, promoted a consultation to elaborate an international plan of action (entitled IPOA-Seabirds), that includes the measures for the reduction of the incidental capture of seabirds by the longline fisheries. During the preparation to the consultation, it was established the Seabird Technical Working Group - STWG, composed by 16 experts from the regions with the biggest problems of birds' incidental capture. They prepared, revised and systematized the supporting documents - including a revision from Cooper (1999) - concerning the seabirds' incidental capture and mitigation measures. It were also elaborated preliminary documents indicating guidelines to reduce the seabirds' incidental mortality and a plan of action for the implementation of the proposed measures.

The STWG met in Tokyo in March 1998, with the presence of the Seabirds' Conservation Program from BirdLife International. FAO published a consolidated version gathering all the supporting documents (Brothers et al., 1999). This meeting was a considerable advance, because it demonstrated that one of the world's major fishing countries was willing to work together with an international ONG towards the common goals of avoiding the seabirds' mortality and conducting the fisheries activities in an environmental responsible way.

At FAO's plenary session, held in October 1998, it was performed a consultation on the management of fisheries capacity, the sharks fishery and the incidental capture of seabirds by the longline fisheries. During this meeting, with 81 member-countries, including the observers from several governmental and non-governmental agencies, a preliminary version of IPOA was approved. The plan received COFI's endorsement in February 1999 and was adopted by the FAO's Conference in November of the same year.

The IPOA indicates the concrete and specific actions for the reduction of the incidental capture of seabirds by the longline fisheries, regionally, nationally and globally, stimulating the elaboration of National Plans of Action (NPOA-Seabirds). It was requested that the member-countries elaborated a diagnosis of the incidental mortality extension in their waters and by their fishing fleet and, when necessary, the NPOA elaboration. These documents must contain prescription, plans to the research, development and evaluation of mitigation measures; awareness and educational activities for the fisheries sector

(including crew members) and data collection program (including observers program) to evaluate the incidental capture dimension and the efficiency of the mitigation measures.

Up to date, eight countries elaborated or had started their action plans[1], being the adoption a completely voluntary measure.

Another international initiative aiming the conservation of albatrosses and petrels was the elaboration of the ACAP, established under the auspices of CMS. This agreement includes signatory and no signatory countries of the Convention, and has the main objective of reducing the seabirds' mortality in the open sea, due its interaction with the oceanic fisheries, and at breeding colonies, due to the introduced predators' action.

The countries which ratified the ACAP are legally obliged to adopt actions in order to guarantee the long term conservation of several species (albatrosses and petrels in ample sense) including, if necessary, the habitat management at the nesting zones. The ACAP incorporates an action plans with concrete measures to be developed by the signatory countries.

Until now, eleven countries had signed the ACAP (South Africa, Australia, Ecuador, Spain, New Zealand, United Kingdom, Argentina, Brazil, Chile, France and Peru), and the first six countries had already ratified it. The Agreement is on force since February 1st, 2004. Brazil had signed the ACAP in June 2001, through its embassy in Australia, and its focal point is the Environment Department of the Foreign Affairs Ministry, which is promoting an inter-ministerial consultation for its ratification.

Several regional fisheries management organizations are incorporating the incidental seabirds' capture problematic in their agenda.

The Commission for the Conservation of the Southern Blue Fin Tuna - CCSBT (*Thunnus maccoyii*), composed by Australia, Korea, Japan and New Zealand and the Taiwan National Fisheries Entity, established the mandatory use of torilines in all longline vessels for the Southern Bluefin Tuna which operates 30° S, and recommended that the vessels of other flags that fish in the same area adopt the use of the torilines.

In 2002, the ICCAT approved a resolution about the seabirds' incidental capture on the tuna fishing with longlines; according to this resolution, the member-countries are obligated to inform SCRS and the Commission about the elaboration of their NPOAs, as well as encouraged to collect and voluntarily provide to SCRS all the available information about the interaction between seabirds and tuna fisheries, in order to enable an evaluation of the impact resulted from the activities of the tuna fishing vessels in the Atlantic.

Other fisheries management organizations are considering the adoption of similar measures. In parallel, other countries have been adopting legal rules to oblige the use of mitigation measures. By order of importance, we can point out a few of them:

Australia: imposes, under the Fishing Management Rules (Modif. nº 1/2001) the mandatory use of measures for all the Australian vessels and for the ones who fish in its EEZ. Some of the measures are: toriline, the longline night setting, the use of thawed baits and the discards reduction.

Spain: under Ministerial Order (BOE nº 123/2002), they adopted mitigation measures for the surface longline fleet that fish at the south of 30°S, including the longline night setting and the discardse reduction. There are proposals for the adoption of legal measures by other countries of the European Union.

United States: Established a severe control of the longline fisheries in the Pacific (Alaska, Hawaii and Bering Sea/Aleuts Islands),

[1] At the Appendix I, there is a list of links to acesss the action plans.

especially in order to avoid the mortality of the Short-tailed Albatross *Phoebastria albatrus*[2]. It determines the mandatory use of the mitigation measures (toriline and night setting), including the fishing moratoria when a certain number of captured albatrosses is reached. A program with the support of the government stimulates the installation and use of underwater setting devices.

Uruguay: Their Decree nº 248/1997 points as mandatory several mitigation measures for all the longline fleet - torilines, longline night setting and thawed baits - as well as establishes that scientific observers must be on the fishing vessels.

Gradually, the responsible authorities responsible for this question in different countries are elaborating dispositions and collaborating mutually to introduce, on a mandatory basis, a minimum of mitigation measures in their longline fleet, in order to make the longline fisheries harmless for the seabirds. Actually this subject is still in transition phase, that must be as short as possible, to benefit the seabirds and the fisheries itself. Therefore, it is urgent to study all the possibilities to improve the existing mitigation measures.

The situation in Brazil

Information obtained during the last decades showed that the incidental capture of albatrosses and petrels by the Brazilian fleet, or based on Brazilian ports is significant and tend to increase along with the increment of the domestic fleet. It is necessary to adopt measures in order to reduce the number to acceptable levels.

Brazil has signed the ACAP in June 2001, and in October of the same year, during the First Brazilian Workshop for the Conservation of Seabirds - which included the representatives from IBAMA, MMA, DPA, UNIVALI, FURG, CONEPE, BirdLife International - Brazilian Program, Projeto Albatroz and IFSP - an emergency action plan was elaborated and it subsided the elaboration of the present NPOA-Seabirds Brazil. During this meeting, several items were defined to compose a national strategy for the conservation of albatrosses and petrels to be adopted by the Government:

- To promote research about the incidence of the seabirds' mortality caused by marine fisheries;
- To evaluate and quantify the possible socioeconomic losses related the incidental capture of albatrosses and petrels and propose alternatives for its reduction;
- To apply the known mitigation measures for these fisheries;
- To improve the existing mitigation measures and develop new ones for the actual and future fisheries;
- To promote research about the biology of the albatrosses and petrels in Brazil, aiming their conservation;
- To identify and promote the protection of the breeding and feeding areas of seabirds in Brazil;
- To promote research to evaluate the pollution impact on the marine environment - including petroleum derivates - on the albatrosses and petrels, proposing mitigation measures;
- To develop and implement education programs to the fishing sector about fisheries practices compatible with the seabirds' conservation;
- To amplify and improve onboard observers programs that register the interaction between seabirds and fisheries;
- To incorporate in the Brazilian law adequate measures for the seabirds' conservation;

[2] See *http://ecos.fws.gov/docs/recovery_plans/2005/051027.pdf*. Access in 12/08/2005.

- To promote the ratification of the international agreements concerning the seabirds' conservation for which Brazil is signatory;
- To contribute with criteria and technical patterns to the process of fisheries certification;
- To instigate the cooperation between the industries, NGOs, governments, research and educational institutions, in the national and international levels;
- To favor the international exchange of data on seabirds' mortality and their population status;
- To seek the society involvement with the conservation of albatrosses and petrels;
- To divulge the national strategy and the conservation needs of albatrosses and petrels in international forums.

BirdLife International promoted, in September 2001, the first Taller Sudamericano sobre Conservación de Albatrosses y Petreles, held in Uruguay. Brazil participated with government representatives, including Brazil and NGOs.

The contacts made between these institutions allowed the execution of actions in Brazil, by Projeto Albatroz. Such actions were focused in the production and the divulgation of educational material about the incidental capture and the mitigation measures to fishermen, as well as testing the effectiveness of such measures and monitoring of fishing vessels. The present NPOA-Seabirds Brazil is based on information and experience obtained by the Projeto Albatroz, and the support received from the fisheries industries was fundamental.

In recognition of the problematic of the incidental mortality, all the species of albatrosses that occur regularly in Brazil, as well as the Petrels of the genus Procellaria were included on the Official List of Threatened Species (IN MMA n° 3, May 27th, 2003). This way, the Brazilian government officialized the need to propose public policies in order to conserve these species, and this NPOA-Seabirds Brazil supplies this demand.

The IBAMA's Edict nº 55/04-N officially created, in June 2004, the Working Group for the Conservation of Albatrosses and Petrels, composed by members of governments, NGOs, representatives and Procellariiformes experts with the objective to advise Ibama on the implementation of public policies for the conservation.

Fábio Olmos

Fig. 6 - Juvenile Black-browed Albatross *Thalassarche melanophris*, killed by a longliner

Objectives

The objectives of the NPOA-Seabirds Brazil are:

- To summarize the existent information about the albatrosses and petrels species that nest in Brazilian territory or are incidentally captured by the commercial fishing vessels;
- To elaborate a diagnosis about the fisheries involved in the incidental capture of albatrosses and petrels;
- To identify the threats to this particular group of birds (Procellariiformes) in Brazil;
- To identify, describe and prioritize the necessary actions to start the recuperation process of the threatened species and reduce the problem of incidental capture;
- To identify the necessary actors to carry out these actions in order to achieve the objectives;
- To provide a tool for governmental bodies and NGOs to promote the actions for the conservation of the albatrosses and petrels;

Albatrosses and petrels in Brazil

Albatrosses and petrels are here part of a group comprising all the members of the order Procellariiformes, also known by other common names (for example, these seabirds are commonly known in Brazil as "bobos", "painhos", "pés-quentes", "patos", "urubus", "pretinhas" and "almas-de-mestre"). This group of birds is distributed throughout the world oceans, presenting the greater diversity at the South Hemisphere, where occur 22 species of Albatrosses, two species of Giant Petrels and at least 75 smaller species of the families Procellariidae, Hydrobatidae and Pelecanoididae.

In Brazilian waters there are documented registers of ten species of Albatrosses (family Diomedeidae), 24 of Petrels, Fulmars and Shearwaters (family Procellariidae), five of Storm Petrels (family Hydrobatidae) and one of Diving Petrels (family Pelecanoididae) (Lima et al., 2002; Olmos, 2002; CBRO, 2005), and among these, only two reproduce in Brazil: the Trindade Petrel *Pterodroma arminjoniana* (endemic from the Trindade and Martin Vaz Islands) and the Audubon's Shearwater *Puffinus lherminieri* (Espirito Santo's islands and Fernando de Noronha Archipelago) (Sick, 1997; Soto & Filippini, 2000).

Despite of the low number of species that reproduce in Brazil, the Brazilian EEZ is a feeding area used by at least 37 species of Procellariiformes, being the highest abundance and richness observed on the coldest waters and at the resurgences of the south/southeast, specially at the Subtropical Convergence, out of the coast of Rio Grande do Sul State, where the hot waters from the Brazilian Current meet the cold waters from the Falklands/Malvinas Current (Vooren & Brusque, 1999).

Fábio Olmos

Fig. 7 - Atlantic Yellow-nosed Albatrosses *Thalassarche chlororhynchos*, White-chinned Petrels *Procellaria aequinoctialis*, Spectacled Petrels *P. conspicillata* and Cape Petrels *Daption capensis* waiting for discards of a longliner

The region of the continental shelf is influenced by the discharges of the Patos Lagoon and the Plata River, and this region and deeper ones receive nutrients brought by the Falklands/Malvinas Current, forming a high productivity area where important preys for the seabirds are concentrated, like squids and small fishes.

Most of these seabirds migrate long distances to the Subtropical Convergence to feed, including transequatorial migrants like the Manx Shearwater *Puffinus puffinus* and also albatrosses that nest in the South Georgia Islands and Falklands/Malvinas. Besides that, during the winter, there is the penetration of

cold waters rich in nutrients, coming from the south, which advance to the Brazilian continental shelf until 23-24°S (Campos et al., 1996). This phenomenon coincides with the pos-reproduction dispersion of species like the White-chinned Petrel *Procellaria aequinoctialis* and the Black-browed Albatross *Thalassarche melanophris*, which become more numerous in Brazilian waters during this period.

General characteristics

The Procellariiformes are among the more oceanic seabirds, rarely approach land, except for reproduction. Several species, specially Albatrosses and Giant Petrels, undertake large migratory movements and longs trips for feeding, covering thousands of kilometers. For example, the Manx Shearwater *P. puffinus* and the petrels *Calonectris diomedea* (Fig. 8) and *C. edwardsii* reproduce at the North Hemisphere, conducting transequatorial migrations searching for the high productivity waters from the western South Atlantic. Instead, the shearwaters *P. gravis* and *P. griseus*, who nest at the South Atlantic islands, migrate to the North Atlantic during the meridional winter (Weimerskirch & Jouventin, 1987; Weimerskirch & Robertson, 1994; Walker et al., 1995; Warham, 1996; Weimerskirch et al., 1999; Berrow et al., 2000a; González-Solís et al., 2000b; Huin, 2002).

Fábio Olmos

Fig. 8 - Cory´s Shearwaters *Calonectris Diomedea*

The great capacity of dislocation and the wide distribution area of the Procellariiformes implicates that the Brazilian fishing activities interfere with the populations that reproduce in the Artic, Antarctic, subantarctic and central Atlantic islands. For example, the Wandering Albatross *Diomedea exulans* and the White-chinned Petrels *P. aequinoctialis* which reproduce in the South Georgia islands, have one of its main feeding areas along the south American continental shelf, including the area under the influence of the Subtropical Convergence, off the coast of Rio Grande do Sul, Uruguay and Argentina (Prince et al., 1992; Weimerskirch et al., 1999; Berrow et al., 2000b), while the Spectacled Petrel *P. conspicillata* (Fig. 9) who nests only at Inaccessible Island[3] (Tristan da Cunha Archipelago), has its major aggregations along the Brazilian south/southeast coast (Olmos, 1997).

Fábio Olmos

Fig. 9 - Spectacled Petrel *Procellaria conspicillata*

The Procellariiformes are extreme K-strategists: they have long lifespan, a low adults mortality and low productivity. All the species have a long lifespan (a female of the Northern Royal Albatross *D. sanfordi* reproduced at 61 years old [Robertson, 1998]), reaching the sexual maturity late (about 5-6 years for the smaller species and 11 years for the Great Albatrosses [Warham, 1990]) and lay only one egg per breeding season, that can occur in intervals of several years. There isn't a reposition in case of egg loss. Several species nests only every two years, being common that the interval between the

[3]See HARRISON (1991) for a map with the localization of the oceanic islands of the world.

reproduction attempts may last longer (Warham, 1990; 1996). Such characteristics make the Procellariiformes, specially the albatrosses, extremely vulnerable to mortality factors that affect the birds in breeding age, such as the incidental capture by longliners (Moloney et al., 1994; Tuck et al., 2001).

Species that nest in Brazil

Only two species[4] of petrels nest in Brazilian territory and both present particular problems of conservation, due the fact that they establish their colonies in islands that are vulnerable to the introduction of predators and habitat destruction. There is no information about the incidental capture of these species by longliners, but this possibility cannot be eliminated.

Regarding conservation status, the categories and criteria[5] are indicated according to the version 3.1 of IUCN (2004).

Common Name: Trindade Petrel
Scientific Name: *Pterodroma arminjoniana* (Giglioli & Salvadori, 1869)
Family: Procellariidae
Conservation Status:
MMA (2003): Vulnerable (D2)
IUCN (2004): Vulnerable (D2)
CMS (2002): No record

The species (Fig. 10) is a medium petrel, without evident sexual dimorphism, with a wingspan sized 89 to 104 cm and weighing 300 to 475 g (Luigi, 1995). It presents great plumage polymorphism, with clear morphs (rare), dark (common) and an intermediary coloration; this fact has brought doubts about the numbers of species that exist in the Trindade Islands.

Francisco Pedro Neto

Fig. 10 - Trindade Petrels *Pterodroma arminjoniana*

Active nests and couples in exhibition flights are observed throughout the year. The nests are built in crevices and caves on the rocky walls, occasionally forming small colonies. The current nesting sites may represent an adaptation for the environmental changes and to the introduction of predators at Trindade Islands. The clutch has a single egg, weighing between 43 to 80 g (68,5 g on average), which is incubated during 52 to 54 days by both parents, which alternate in this activity for a period up to 19 days. The nestlings are able to leave the nests after 95 to 100 days, being the attack of the terrestrial crab *Gecarcinus lagostoma* the main factor of predation during this period (Luigi, 1995) (Fig. 11).

Cesar Musso

Fig. 11 - Crab *Gecarcinus lagostoma* preying on a sea turtle nestling at the Trindade Island

[4] Imber (2004) suggest that *Pterodroma neglecta* nests at Trindade Island.

[5] See Appendix II and III to the criteria summary.

The Trindade Petrel feeds basically on squids, fishes (pursues flying fishes in the air), medusas (Porpita sp.) and pelagic hemipter insects (Halobates sp.), and is rarely attracted by the vessels. (Luigi, 1995).

Breeding Areas

It nests only at the Trindade Islands (Fig. 12) and nearby small islands (20°30'S-29°19'W), which are approximately 1,200 km far from the continent, and at the Martin Vaz Archipelago (20°15'S-28°55'W), situated around 50 km from Trindade. According to Luigi (1995), however, the species wouldn't be nesting at Martin Vaz anymore. This petrel nests only in Brazil.

Cesar Musso

Fig. 12 - Pteridophyt on Trindade Island shore

Dispersion and migrations

There are no records of this species at continental South America, suggesting that it uses waters distant from the coast, with registers at south until the Subtropical Convergence. Curiously, it is often observed off the eastern North American coast, at the Golf Current's waters (off North Carolina between May and September) and there are records in the eastern North Atlantic (Azores and England) (Brinkley & Patteson, 1998).

Status

In the mid 90's, the Trindade population was estimated in around 5,000 individuals (Fonseca-Neto, 2004). There is no information about Martin Vaz. The Trindade Island was submitted to an accentuated progress of destruction of its native vegetation: a forest dominated by the Saguaragy Bark *Colubrina glandulosa* var. *reitzii* occupied 85% of the island's surface until the beginning of the 18th century. The cause of such loss seems to have been a combination of fire caused by human influences and the overgrazing by the introduced goats (Olson, 1981).

The destruction of the forests caused a great decline of the birds that nested in trees, like the Red-footed Booby *Sula sula* - apparently extinct in the Island - and two subspecies of endemic Frigatebirds, the Nicoll´s Frigatebird *Fregata minor nicolli* and Lesser Frigatebird *F. ariel trinitatis*, both considered Critically Endangered by MMA (2003). Currently, there is a project for the reconstitution of the Trindade's forest, conducted by MNRJ, Brazilian Navy and IBAMA[6].

The introduced predators, like pigs, cats and goats, certainly had an impact over all the seabirds. The Brazilian Navy, who maintains an oceanographic post at Trindade, eliminated the pigs, and the cats seemed to have been extinguished. However, there is still the risk that rats can be reintroduced. According to Ruy Válka, researcher from MNRJ (*in litt.*), the last goats were eliminated in October 2004 by the Brazilian Mariners "Tonelero", but future missions will have to confirm this information, what the researcher finds it very plausible.

The Brazilian Navy has a project to build a small airport and install wind turbines at the Trindade Island, which may seriously affect the seabird populations.

[6] See *http://acd.ufrj.br/~mndb/trimanpo.html*. Access in 12/09/2005.

Common Name: Audubon's Shearwater
Scientific Name: *Puffinus lherminieri* Lesson, 1839
Family: Procellariidae
Conservation Status:
MMA (2003): Critically Endangered (D)
IUCN (2004): No record
CMS (2002): No record

The petrels of the complex *Puffinus lherminieri/assimilis* constitute a controversial group of 20 taxa distributed in the tropical, subtropical and subantarctic seas (Harrison, 1990; Warham, 1990; Shirihai et al., 1995), with an obscure taxonomy (Shirihai et al., 1995; Austin, 1996; Bretagnolle et al., 2000). Austin et al. (2004) indicated that the taxonomy proposed until now is not supported by molecular phylogeny, proposing that 14 taxa should be recognized and suggesting that other five are probably not valid.

The birds that nest in Fernando de Noronha are identified as *P. lherminieri* (Silva e Silva & Olmos, in prep.). In the Itatiaia Islands (Espírito Santo State), Efe & Musso (2001) registered a small breeding population identified as *P. lherminieri* (Fig. 13), but its taxonomic status must be evaluated.

Fábio Olmos

Fig. 13 - Audubon's Shearwater *Puffinus lherminieri* at the Morro do Leão Island, Fernando de Noronha

The Audubon's Shearwater is a small petrel, with a wingspan between 65 and 70 cm. In Espírito Santo, nine individuals weighed 203 to 249 g (Efe & Musso, 2001). The cap (to below eye) and the back are blackish-brown; the face, throat and the abdomen are white and the undertail coverts have many brown shades. In Brazil, it nests in rocky cavities, but in other regions it may also nest in burrows that they dig, where they lay a single egg that is incubated for 49 to 50 days; the fledging occurs after 62 to 75 days. At Espirito Santo there is a record of one bird that incubated in August.

There is little information about its diet, which includes crustaceans, planktonic fish larva (Harris, 1969) and flying fishes during the flight. Birds of this group also capture preys by diving and pursuing them under the water; *P. l. nicolae* of the Seychelles Islands (Indian Ocean) is a capable diver able to descend to 15 m (Burger, 2001).

Breeding areas

Puffinus lherminieri lherminieri breeds in several localities in the Caribbean (like Bahamas, Jamaica, Antilles, Grenadines, Bermuda and Tobago). In the South Atlantic, *P. lherminieri* was also recorded at Saint Helen and Ascension Island (property of the United Kingdom), respectively as some few sub fossils and living birds and abundant sub fossils (Olson, 1977). This species seems to be totally extinct after the human colonization (Olson, 1975).

In Brazil it nests in Itatiaia Islands, Espírito Santo (20°21'30"S-40°16'45") (Efe & Musso, 2001) and in the Islands of Morro do Leão and Morro da Viuvinha, in Fernando de Noronha (approximately 03°54'S-32°25'W) (Soto & Filippini, 2000).

Dispersion and migrations

Individuals of *P. Iherminieri* were observed at 26°S in the continental shelf between São Paulo and Paraná States (Olmos, 1997).

Status

In Brazil, less than ten couples of *P. Iherminieri* were observed in each one of the localities where the species were registered. In the Itatiaia Island, according to Márcio Efe (*in litt.*), after the nesting record, in 1993, apparently there haven't been any new occurrences; nevertheless, intensive surveys were not conducted. Six active nests were found at the Morro da Viuvinha Island, in Fernando de Noronha, in September 2003 (Silva e Silva & Olmos, in prep.).

There are introduced predators in Fernando de Noronha - rats, cats, dogs and lizards - which probably impede occupation of the main island by the Audubon's Shearwater, besides certainly predating other seabirds. The Morro da Viuvinha Island is close to the beach and this fact can put the species in danger due to rat invasion, that can decimate the birds that nest there. The Itatiaia Islands are managed aiming their use by seabirds, specially for terns (*Sterna* spp.) and there aren't introduced predators.

Migratory species that interact with fisheries

Twenty or more seabird species interact with longlining in Brazilian waters, following the vessels and feeding on fishery discards (Olmos, 1997; Neves & Olmos, 1998; Olmos et al., 2001). Nevertheless, several of theses species eat only at the surface or follow the vessels for a short period or, even still, are too small to swallow the baited hooks and be captured. Among them, could be listed *Pterodroma incerta*, *P. mollis*, *Calonectris diomedea borealis*, *Calonectris edwardsii*, *Puffinus puffinus*, *P. griseus*, *Oceanites oceanicus*, *Fregata magnificens*, *Morus capensis* and *Stercorarius* spp.

It is interesting to note that *C. diomedea* is a longlining victim at the North Hemisphere (Cooper et al., 2003), but this was still not registered at the western South Atlantic.

Below, we present a summary of the main species of Albatrosses and Petrels that interact with fisheries in Brazil. Except when indicated, the information is based upon Murphy (1936), Warham (1990, 1996), Gales (1993, 1998), Croxall et al. (1995), Tickell (2000) and BirdLife International (2004).

Regarding the conservation status, the categories and criteria[7] are indicated according to the version 3.1 of IUCN (2004).

Common Name: Wandering Albatross
Scientific Name: *Diomedea exulans* Linnaeus, 1758
Family: Diomedeidae
Conservation Status:
MMA (2003): Vulnerable (A1bd + A2bd)
IUCN (2004): Vulnerable (A4bd)
CMS (2002): Appendix II

The males are bigger than females, weighing between 8.19 to 11.9 kg and 6.35 to 8.71 kg, respectively, at the South Georgia Islands. The wingspan varies between 2.72 to 3.45 m.

The Wandering Albatross (Fig. 14) nests in dispersal colonies; the egg laying occurs between December and February and the incubation, which is shared between the parents, lasts around 11 weeks. Males and

[7] See Appendix II and III to the criteria summary.

females start to breed generally with 11 years old. However, the age for the first reproduction has decreased in declining populations due to the mortality caused by longlining. The breeding success varies annually between 52 to 73% (64% on average) in the South Georgia Islands.

The single nestling takes 40 weeks to leave the nest, which occur between November and February. The long breeding period (55 weeks) makes this species to reproduce only every two years or more. Well succeeded pairs may return to the colony only after 3-4 years after reproduction. In 1997, there were 19 birds of 39 years old nesting in the Bird Island (South Georgia) and it is probable that some individuals reach more than 50 years old.

The juveniles leave the nest with the plumage almost entirely chocolate-brown, that becomes clearer as they get older, and the males become whiter than the females; oldest individuals acquire a snowy plumage.

Fábio Olmos

Fig. 14 - Wandering Albatross *Diomedea exulans.*

The juvenile stays at the ocean during five years, before they return to its original colony, exhibiting a high degree of philopatry. About 50% of the juveniles of the South Georgia Islands survive until this age. The adults, though, on the period between 1972 to 1985, presented an annual survival expectancy of 94%, which represents a reduction of 1-2% comparing to the 1960's decade, due the mortality caused by longlining. The males have a survival expectancy of 2% higher than the females, who feed in lower latitudes and this way seems to have more interaction with longliners.

Diomedea exulans and other Great Albatrosses capture preys mainly at the surface, having a limited capacity to dive. At the South Georgia Island they feed mainly on squids and fishes, which represents, respectively, 35 and 45% (in mass) of the nestlings' diet. Among fishes, they consume the demersal Blackfin Icefish (*Chaenocephalus aceratus*) and Smalleye Moray Cod (*Muraenolepis microps*), which must be obtained from fishing discards or from fluctuating bodies after the spawning. The albatrosses also consume carrion (like dead marine mammals), tunicates, jellyfish and crustaceans (like the Lobster Krill *Munida gregaria*). Changes on the oceanographic conditions have a strong influence on the foraging patterns and on the captured preys (Xavier et al., 2003). The major part of the food is obtained during the day, although there is some degree of night foraging.

Most of the consumed squids are large sized mesopelagic species, such as the Giant Warty Squid *Kondakovia longimana* (weights on average 3kg) and must be captured as carrion, but the albatrosses can capture large squids at the surface during the night, when they perform vertical migrations. The predisposition of this species in consuming dead preys associates them to the fishing vessels to eat the discards, and they are very aggressive in disputing them with the other birds.

Breeding areas

At the Atlantic Ocean the species breeds at the South Georgia Islands (around 2,000 breeding pairs/year), specially at Bird Island (60% of the Archipelago's population). The breeding population at the Falklands/Malvinas Islands was extinct in 1979, due to human pressure. The species also breeds at the Prince Edward and Marion Islands; Crozet Island and Kerguelen Island; and Macquarie Island, which belong, respectively, to South Africa, France and Australia.

Dispersion and migrations

The Wandering Albatross occurs at the larger part of the Austral Ocean; from the Antarctic Polar Circle (around 68°S) to the Capricornius Tropic (around 23°S) and, occasionally, even up to north, with some records off the Californian coast and in the North Atlantic. During the winter, the largest part concentrates at the north of the Antarctic Convergence (Tickell & Gilson, 1968; Marchant & Higgins, 1998). During the reproduction, the South Georgia population feeds in the islands' shelf and to the west, specially along the continental slope, and off the Patagonian continental shelf and south of Brazil. During the summer, the females use the south American continental shelf margins (north until around 32°S) and the males use the waters off the Antarctic Peninsula. In the winter, the males get together with the females. The feeding trips to the Argentina's north waters and South of Brazil's waters cover over 9,000 km and take approximately 15 days.

The species performs great dislocations, and the individuals who nest in the Atlantic seems to make a circumpolar migration to the east, what takes them to the south coast of Australia and to the Pacific Ocean, before returning for its breeding colonies at South Georgia. Banded birds of this population have been captured at the Brazilian south coast (specially by longliners operating off the coast of Rio Grande do Sul and Santa Catarina States), South Africa and the south of Australia and New Zealand. In Brazil, the Wandering Albatross has been recorded since Rio Grande do Sul until around 23°S (Fig. 15).

Fig. 15 - Oceanic distribution of the large Albatrosses *Diomedea* spp.

The Brazilian longliners seems to capture mainly individuals belonging to the South Georgia population (12 records until 2001). However, the capture of an individual banded in the south of Australia, off the Rio Grande do Sul coast, may indicate the presence of birds from other populations in Brazilian waters (Soto & Riva, 2000; Olmos, 2002a).

Status

The world population has approximately 8,500 annual breeding pairs, which corresponds to around 28,000 adult individuals. The South Georgia population decreased 28% between 1960 and 1966 (0.8% per year), what coincides with the reduction of the surviving expectancy of the adults and juveniles. An annual decline of 10% of the juvenile survival rate occurred simultaneously with the decline of 2 to 3% per year of the adult rate.

Common Name: Tristan Albatross
Scientific Name: *Diomedea dabbenena* (Mathews, 1929)
Family: Diomedeidae
Conservation Status:
MMA (2003): Endangered (B1 + 2e)
IUCN (2004): Endangered (A4bd; B2ab[v])
CMS (2002): No record

The Wandering Albatross (*D. exulans*) from the islands of central south Atlantic was considered a full species - *D. dabbenena* - only recently, based on molecular studies (Nunn et al., 1996; Nunn & Stanley, 1998).

Morphologically, it is different from the first one due to the smaller size of wing, tarsus and specially, the bill. A male presented a wingspan of 2.83 m.

An important characteristic of the Tristan Albatross (Fig. 16) - also know as Gough Albatross - is that it does not present plumage stages so clear as the Wandering Albatross, specially the females, which reproduce and maintain for the entire life a darker plumage, specially on the head, neck and breast. The females maintain a breast stripe and the dorsal part of the wings black even when the back acquired an almost completely white color. The juveniles leave the nests with a paler and grayish plumage than the *D. exulans* juveniles (Ryan, 2000).

Adults in incubation are observed at the Gough Island (possession of the United Kingdom, around 350 km SE far from Tristan da Cunha) in January/February, while the young with the same size of the parents, but

Fábio Olmos

Fig. 16 - Tristan Albatross *Diomedea dabbenena*

covered with fluffy feathers, are present in September, leaving the nests in November/ December. The species nests biennially. The breeding success - which represents the number of fledglings versus the layed eggs - varies between 46 and 69%. The juveniles start to return to the colonies when they are 4 to 5 years old. The philopatry is very high: 80% of the individuals return to its original colony. Generally, the Gough Albatrosses have their first reproduction at 8-9 years old (10-12 for *D. exulans*), some start to breed when they reach 6 years. The biggest longevity registered, by means of banding, was 22 years.

During the reproduction, the main food items in Gough are squids (six species of the genus *Histiotheuthis*) and about 18 species of cephalopods (Cherel & Clages, 1998). Individuals following longliners off the Brazilian coast feed on discarded baits (squids *Illex argentinus*) and on fish offal discards, specially shark's livers.

Breeding Areas

The Tristan Albatross was extinct in Tristan da Cunha since the beginning of the 20th century, due to the eggs and young exploitation for food by the local inhabitants. However, between one and three pairs nest annually at Inaccessible Island (Tristan da Cunha Archipelago). The Gough Island hosts almost all the individuals of the species, about 1,500 pairs.

Dispersion and Migration

Individuals banded in Gough have been recaptured off the Uruguayan and Brazilian coasts (respectively, one and three records), at the south of Africa and southeast Australia (Ryan et al., 2001). The records in South America and Africa suggest dislocations for feeding, while the Australian indicates that individuals from Gough Island perform circumpolar migrations similar to some *D. exulans*. Recent studies of satellite tracking confirmed that during the reproduction, this species feeds on the South American continental shelf and suggest that this region is used mainly by the males, while the females forage preferentially to the east of Gough (R. Cuthbert, *in litt.*).

The MZUSP holds two males banded at Gough Island and captured by Brazilian longliners and four females of *D. dabbenena* not banded and captured by the same way; both were obtained between Santa Catarina and Rio Grande do Sul states, in October and November (Neves & Olmos, 2001).

Status

Between 1979 and 1981, the breeding population in the Gough Island has been estimated in approximately 1,000 pairs. On 1999, 1,129 young were censed, corresponding to 1,500 pairs and equivalent to a total population of 9,000 individuals (Ryan et al., 2001). Recent census suggested that the populations declined 28% in the past 46 years, while the population models preview an annual decline of 2,9 to 5,3% (Cuthbert et al., 2004). Only one nestling was found in Inaccessible Island (Ryan et al., 2001).

Common Name: Southern Royal Albatross
Scientific Name: *Diomedea epomophora* Lesson, 1825
Family: Diomedeidae
Conservation Status:
MMA (2003): Vulnerable (D2) IUCN (2004): Vulnerable (D2) CMS (2002): Appendix II

Comparatively with the *D. exulans* and *D. dabbenena*, the Southern Royal Albatross (Fig. 17) has bulbous nostrils, a larger and robust bill and the edge of the maxilla black. The juveniles leave the nest with a plumage similar to the adults, and the difference is the black coloration on the dorsal part of the wing and variable quantity of dark feathers on the back, what gives an effect of narrow spots. With the time, the dorsal part of the wings acquires a white color, from the anterior edge, becoming almost totally white in old individuals. The tail also becomes white (*D. exulans* maintains most of the rectrices with black tips) The maximum wingspan is about 3m. The males are bigger, weighing between 8.1 to 9.45 kg, while the females vary between 6.5 to 9 kg.

Tony Palliser

Fig. 17 - Southern Royal Albatross *Diomedea epomophora*

The clutches are laid in November and December, and the hatching occurs between February and March. The fledging occurs after eight months, in October/November. The pairs nest in a minimum interval of two years, when well succeeded. The breeding success in the Campbell Islands (that belong to New Zealand) was 58% on average, during three years.

While the Wandering Albatross forages at the continental slope or outside the continental shelf, the Southern Royal Albatross is found on the waters over the shelf. The diet at Campbell consists, in mass, of 75% cephalopods, 21% fishes, 3% crustaceans and 1% tunicates. The food contents of two individuals found in Rio Grande do Sul had Barbell Drum *Ctenosciaena gracilicirrhus* and the squids *Ommastrephes bartrami*, *Lycoteuthis diadema*, *Cyclotheuthis* sp. and *Grimalditheuthis* sp. (Petry et al., 2001).

Breeding areas

The species nests at Auckland Islands, that belongs to New Zealand (composed by Auckland, Adams and Enderby Islands), Campbell Islands and also Taiaroa Head, an island at the south of New Zealand.

Dispersion and migrations

After reproduction, the seabirds disperse to the east, until the coasts of Chile and Peru, being also recorded over the waters of the continental shelf. From there, they contour the Horn Cape and are found over the Argentinean continental shelf (including Falklands/Malvinas) and south of Brazil, where they remain before migrating though the Atlantic and Pacific, returning to the nesting areas.

In Brazil, there are records in Rio Grande do Sul State (specimens in the Zoology Museum of the Rio dos Sinos University) and in Rio de Janeiro State (one specimen in the National Museum of Rio de Janeiro). An old record in São Paulo was based upon an individual captured nearby Alcatrazes Islands, still kept at MZUSP. Individuals captured in Rio Grande do Sul, one of them by a longliner, had been banded at Campbell (Olmos, 2002b).

Status

The Campbell population corresponds to 99% of the world population and is estimated in 8,200 to 8,600 breeding pairs, and apparently has stabilized after an increase in number during the 1980's. In 1955, 55 pairs were reproducing at Enderby and around 20 in Auckland and Adams. No pure D. epomophora is present at Taiaroa Head.

Common Name: Northern Royal Albatross
Scientific Name: *Diomedea sanfordi* (Murphy, 1917)
Family: Diomedeidae
Conservation Status:
MMA (2003): Endangered (A2c + B1 + 2ce)
IUCN (2004): Endangered (A4bc + B2ab [iii, v])
CMS (2002): No record

The adults of this species (Fig. 18) are distinguished from the *D. epomophora* and *D. exulans* by the unique combination of white back and dorsal part of the wings entirely black. The juveniles leave the nest with a plumage similar to the adults, differing only in the quantity of darker feathers on the back, which produce a spotted effect, and also by dark feathers on the top of the head. Like *D. epomophora*, *D. sanfordi* has bulbous nostrils and a maxilla with black edges, but the morphometry is significantly bigger in the second one. Adults collected at the Chatham Archipelago (that belongs to New Zealand) weighed between 6.35 and 6.6 kg.

Fábio Olmos

Fig. 18 - Northern Royal Albatross *Diomedea sanfordi*

The birds start to return to the reproduction colonies in September and the clutches are laid in the end of October at Taiaroa Head and in the middle of November at Chatham. The incubation lasts, on average, 79 days and the juveniles leave the nest after 32 to 38 weeks. Therefore, the nesting activities lasts, on average, 46 weeks, and the species reproduces biennially. The juveniles stay at the sea between 4 and 8 years, before their return to the original colony. The first reproduction occurs between 6-11 years. The longer lifespan, obtained by means of banding, was 61 years old, and this individual still produced a young before disappearing. The breeding success at Taiaroa Head, during the last 17 years, was 31% on average. It is estimated that 57% of the juveniles survive until the breeding age. In the 1990's decade, between 94.6% and 95.3% of the adults survived, while in the 1940/1950's decade there was a 98.9% survival. At the Chatham Islands, the annual productivity between 1990 and1966 was only 18%, due to the degradation of the vegetation coverage, what caused nests flooding and the eggs breaking.

The diet at the Chatham Island is composed, in mass, by 85% of cephalopods, 14% of fishes and 1% of tunicates. At Taiaroa Head, they consume, in mass, 80% of cephalopods, including octopus apparently obtained by the discards, 15% of fishes, 3% of crustaceans, and 2% of tunicates.

Breeding areas

The species nests in only three small islands of the Chatham's Archipelago (Motuhara, Big Sister and Little Sister), besides Taiaroa Head. In the last one, the population includes several hybrids among *D. epomophora* and *D. sanfordi*, having a unique status.

Dispersion and migration

When the reproduction period is over the seabirds fly to the east, until the coast of Chile and Peru, where they are observed over the continental shelf, feeding and molting. From there, they contour Cape Horn and are found over the Argentinean continental shelf (including the Falklands/Malvinas) and the south of Brazil, which seem to be important foraging areas. The birds migrate through the Atlantic Ocean, across the south-African coast and go to the Austral Ocean, returning to the nesting areas. An individual was found at Falklands/Malvinas eight days after leaving the Chatham Islands.

Their presence in Brazil is based upon a record of an individual accompanying a longliner, off the Santa Catarina's coast (Olmos, 2002b) and other records outside this State and in Rio Grande do Sul State, which were obtained through the Projeto Albatroz on Board Observers Program.

Status

The Chatham population, which corresponds to 99% of the world population, is estimated in around 6,500 to 7,000 breeding pairs. At Taiaroa Head, in 1995 there were 27 pairs, including five hybrids with *D. epomophora.*

Common Name: Black-browed Albatross
Scientific Name: *Thalassarche melanophris* (Temminck, 1828)
Family: Diomedeidae
Conservation Status:
MMA (2003): Vulnerable (A2bd + 3bd + 4bd)
IUCN (2004): Endangered (A4bd)
CMS (2002): Appendix II

The adults are white with black wings and a characteristic orange bill with a reddish tip (Fig. 19). There is a conspicuous dark ocular band, a characteristic shared with other species from the genus *Thalassarche*. The juveniles leave the nests with browned breast bands and with a black bill, which became browner with a black tip. The maximum wingspan is approximately 2.5 m. At South Georgia, the males weigh between 3.35 and 4.66 kg and the females between 2.9 and 3.8 kg.

Luciano Candisani

Fig. 19 - Black-browed Albatross *Thalassarche melanophris*

Burg & Croxall (2001) found high genetic differences between the birds from Falklands/Malvinas and from the South Georgia, as big as these and *T. impavida*, which is the sister-species endemic from the Campbell Island. The type of *T. melanophris* was collected at Good Hope Cape, an area used by the South Georgian individuals; therefore the Falklands/Malvinas population must have a taxonomic revision.

In Falklands/Malvinas, the birds arrive to theirs colonies between the end of August and beginning of September, laying eggs in October; in South Georgia this happens three weeks after. The incubation takes around 68 days and the juveniles leave the nests after 116-125 days, which corresponds to March/April for the Falklands/Malvinas birds. The breeding cycle is relatively short, allowing the species to reproduce annually. More than 99% of the eggs hatch and between 29 to 77% of the nestlings survive until the fledging age. The breeding success in South Georgia, between 1975 and 1991, varied from 0 to 64% (29% on average), and it is directed related to the krill (*Euphausia superba*) availability. The juveniles return to their colonies when they are 3 to 8 years old and start to reproduce at 6-13 years old. The philopatry is slightly high (58% of the juveniles return to the original colonies in South Georgia) and the adults don't change colonies. The annual survival for males and females is from 94% to 96%, respectively.

In South Georgia the feeding is composed, in mass, by 40% of krill, 39,5% of the lamprey *Geotria australis*, 21% of cephalopods (specially squids from the genus *Todarodes*) and fishes. In Falklands/Malvinas, the main preys are squids (specially *Loligo gahi*) and fishes, which together constitute 90% of the diet's mass, being the medusas and crustaceans (lobster krill *Munida gregaria*) the remaining. This way, there are important ecological differences between the two populations. *Thalassarche melanophris* has a good diving capacity, and they capture preys at least 5m deep.

The species is remarkable by its enthusiasm and aggressiveness when it is following the fishing vessels and foraging on its discards, forming large groups around the operating longliners.

Breeding areas

At the Atlantic Ocean, the biggest population is at the Falklands/Malvinas Archipelago (12 sites), specially at the Steeple Jason Islands and Beauchene Island (each one with over 100,000 breeding pairs). There are also colonies at South Georgia and, in the limit between the Atlantic and Pacific oceans, at Diego Ramirez and Ildefonso Islands (Chile). Outside of the Atlantic there are colonies at the following islands: Crozet, Kerguelen, Heard, McDonald, Macquarie, Bishop, Clerk, Antipodes, Campbell and Snares.

Dispersion and migrations

The individuals from South Georgia, during the breeding period, feed basically over the continental shelf of that archipelago and the one from South Orkney, do not getting close to the continental shelf of the Falklands/Malvinas and Patagonia. After the reproduction, most of the birds dislocate to the south of Africa, and are found in Benguella Current region and the Cape of Good Hope. There are several recaptures at the south of Australia and New Zealand, suggesting a circumpolar migration. Nevertheless, there are some records of birds banded in Bird Island and captured in Uruguay, at the Buenos Aires province (Argentina) and one in Rio de Janeiro (Olmos, 2002a).

The birds from Diego Ramirez Island use the waters close to Cape Horn and the Pacific coast at South America, in the region under the influence of the Humboldt Current. The individuals from the Falklands/Malvinas seem to be restricted to the waters nearby the islands and to the neighbor continental shelf of Patagonia, during the breeding period. The banded birds from this archipelago have been recuperated from the South American east

coast to the northeast of Brazil (Maranhão State), with a larger number found in the south of Rio de Janeiro (Cabo Frio). Such fact suggests a dislocation to the north, maybe following the Falklands/Malvinas Current until the Subtropical Convergence, and from there to the cold and richer waters over the Brazilian continental shelf during the winter.

Status

The total breeding population was estimated in around 680,000 pairs, with 80% in Falklands/Malvinas, 10% in South Georgia and 3% in Chile. Recently, a revision pointed approximately 530,000 breeding pairs, with 70% at Falklands/Malvinas, 20% in South Georgia and 10% in Chile.

Some populations in South Georgia had a 35% reduction since 1989/90; in 1995, around 9,500 nested in Bird Island. In general, all populations monitored there decreased 31% in that period. The breeding success and the adult annual survival expectancy also decreased. The colony in Steeple Jason, the largest in the world (68% of the birds of the archipelago), lost 41,200 pairs, and have

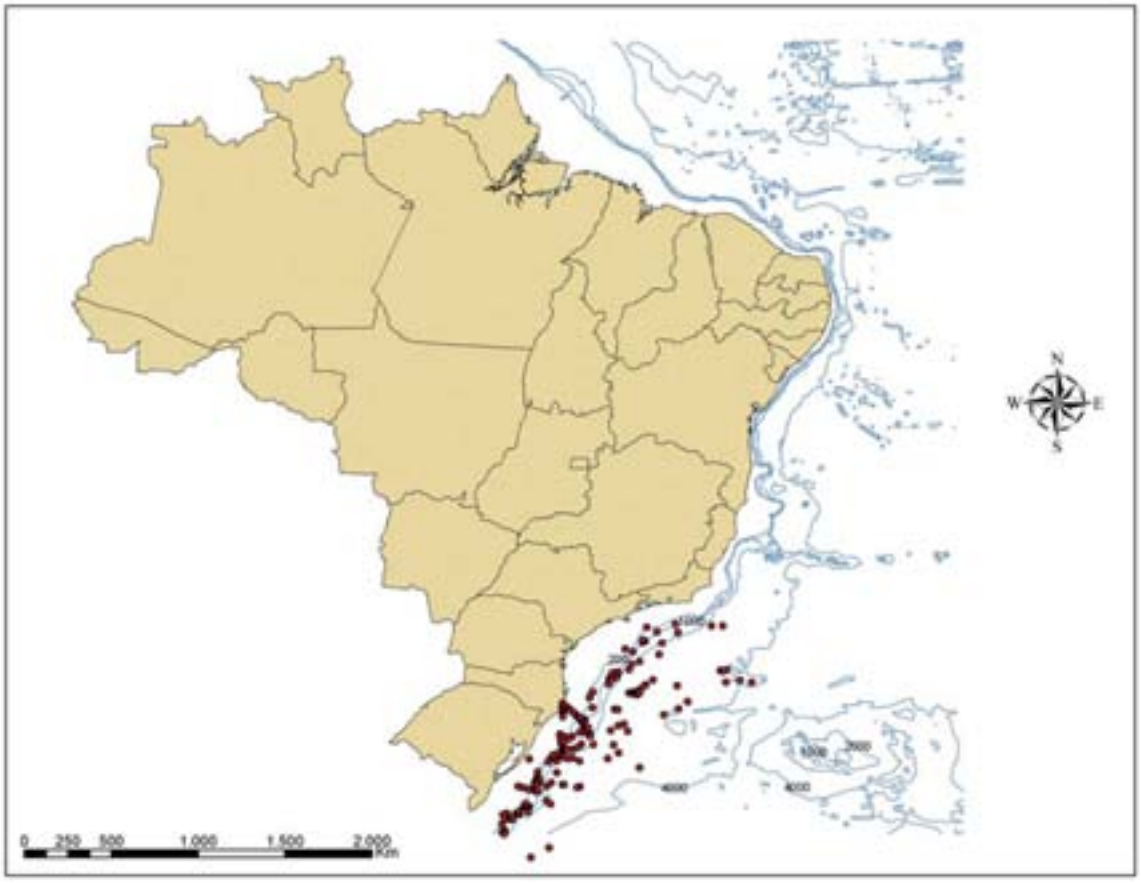


Fig. 20 - Oceanic distribution of the Black-browed Albatross *Thalassarche melanophris*

currently around 150,000 breeding pairs (Huin, 2001; B. Sullivan, personal comm.).

It is estimated that in the last twenty years the Falklands/Malvinas population decreased between 506,000 and 382,000 breeding pairs, and from 468,000 to 382,000 pairs only in the last five years (Huin, 2000). Thus, the estimated decline of the species will be around 65% in three generations (65 years) and considering that there are few places where there is a population growth, it is expected a decline of more than 50 % in this period.

Common Name: Atlantic Yellow-nosed Albatross
Scientific Name: *Thalassarche chlororhynchos* (Gmelin, 1789)
Family: Diomedeidae
Conservation Status:
MMA (2003): Vulnerable (A1ad + A2b + B1)
IUCN (2004): Endangered (A4bd)
CMS (2002): Appendix II

The main characteristic of this species is a yellow stripe on the dorsal side of the maxilla (Fig. 21), which ends with a rounded design, contrariwise to the sister-specie *T. carteri* from the Indian Ocean, which ends with a pointing design. *Thalassarche chlororhynchos* has a grayish head and neck, lighter at the crown, while *T. carteri* has a white head but with some light grey coloration on the face. It is one of the smallest albatrosses: the wingspan of four individuals alternate between 1.98 and 2.07 m. The males seem to be bigger than the females, such as in the other albatrosses' species. Individuals from Gough weighed from 1.78 to 2.84 kg.

Fábio Olmos

Fig. 21 - Atlantic Yellow-nosed Albatross *Thalassarche chlororhynchos*

The species reproduces annually, and the first birds arrive at the nesting areas in the middle of August. In Nightingale (that belongs to the Tristan da Cunha archipelago), most of the eggs were laid between 10 and 20th of September, hatching in the beginning of December, after approximately 78 days of incubation (Elliott, 1957). In Gough, the clutches were laid in September/October and the first nestlings hatched at the end of November; on December 2nd, 75% of the eggs had already hatched and by the end of December, most of the nestlings fledged (Ryan & Moloney, 2000). At Tristan da Cunha and Gough, the juveniles leave the colony in the end of April and beginning of May (Elliott, 1957; Swales, 1965). The adults' annual survival expectancy, in Inaccessible and Nightingale, was approximately 84%, while for the juveniles of the Inaccessible it was 82%.

The species diet is not well known but cephalopods were found in all stomach contents of the individuals collected at Gough, while fishes and amphipods occurred only in a few samples.

Breeding areas

The species reproduces in Tristan da Cunha archipelago (Tristan da Cunha, Nightingale, Inaccessible, Middle e Stotenholf) and at Gough. The bigger populations are at the Tristan da Cunha and Gough islands.

Dispersion and migrations

It seems that *T. chlororhynchos* prefers warmer waters comparing to the other albatrosses. In South America, there are few records at the south of the Subtropical Convergence, although hundreds had been recorded outside of the Prata River. The

species is common off the south and southeast Brazilian coast (including Rio de Janeiro) (Fig. 22) and there are several records at the northeast. In the south of Africa it occurs outside of the Benguela Current system, again preferring the warmest oceanic waters. The number of the individuals increases in both regions during the winter, when the birds leave the reproduction areas. Banded individuals in Gough, Inaccessible and Tristan da Cunha had been recaptured mainly in the south of Africa, but also at São Paulo, Santa Catarina and Rio Grande do Sul states, including birds killed by longliners (Soto e Riva, 2001; Olmos, 2002a). There are records of this species at New Zealand and south of Australia, however, with minor occurrence compared to the Indian Yellow-nosed Albatross *T. carteri*.

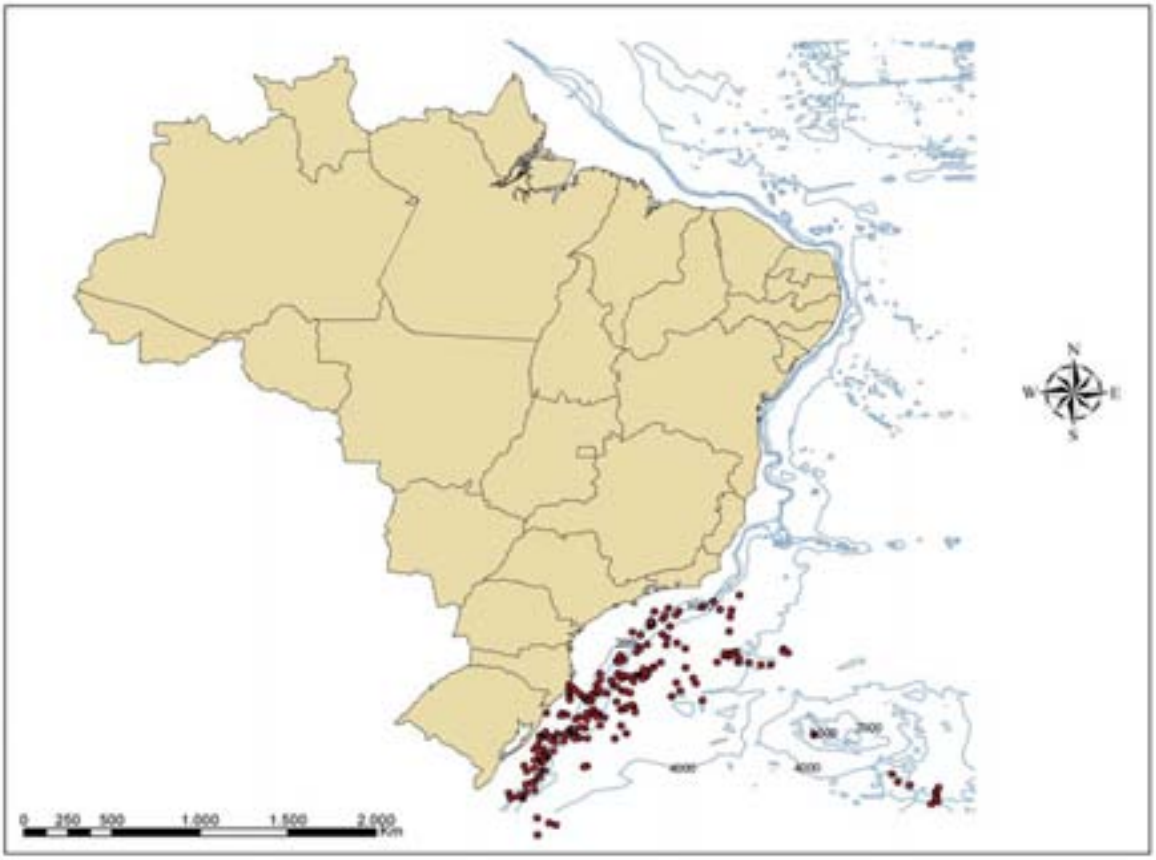


Fig. 22 - Oceanic distribution of the Atlantic Yellow-nosed Albatross *Thalassarche chlororhynchos*

Status

On 1972/1973, the population of Tristan da Cunha was estimated in around 20,000 breeding pairs and at Gough, in 7,500 pairs. On 1980, the population of the first region was 21,600-35,600 pairs. On 1982, there were 1,100 breeding couples at Inaccessible (Gales, 1998; Ryan & Moloney, 2000). There are evidences of a significative decline of all the populations since the 1980's. At Gough, in the season 2000/2001, it was censed 5,250 pairs (Cuthbert et al., 2003).

Demographic data has been collected in the two colonies at Gough and Tristan da Cunha, during 20 years. During this research, the populations declined 1.1 a 1.2%, per year. However, the population models estimate a higher decline rate, between 1.5 and 2.8%, at Gough, and 5.5% at Tristan da Cunha (Cuthbert et al., 2003). Such declines indicate a reduction of 58% during three generations of the species (71 years).

Common Name: Grey-headed Albatross
Scientific Name: *Thalassarche chrysostoma* (Forster, 1785)
Family: Diomedeidae
Conservation Status:
MMA (2003): No record
IUCN (2004): Vulnerable (A4bd)
CMS (2002): Appendix II

The adults are well characterized by its slate-grey head and by the color of the bill, which presents large yellows stripes at the maxilla and at the mandible (Fig. 23). The juveniles have a brownish head and black bill. The wingspan is from 2.1 to 2.4 m. The males from South Georgia weigh between 3.9 and 4.35 kg and the females, between 3.52 and 4.17 kg.

G. Robertson

Fig. 23 - Grey-headed Albatross *Thalassarche chrysostoma*

The breeding colonies show great annual variation in its population size. The philopatry is high: 85% of the birds nest at the colony where they were born. The average age for the first reproduction is 12 years (10 to 14 years). Generally, the pairs reproduce biennially when well succeeded, but longer intervals are common. The birds arrive in South Georgia in the middle of September, laying their clutches in October and the hatching occur in December and January. The breeding success at the archipelago has an average of 39% with a significant annual variation in all the breeding patterns. Around 60% of the eggs hatch and 65% of the nestlings survive until fledging, that happens between the months of May and June. The nestlings grow slower than the *T. melanophris* ones, apparently because the last one consumes high quantities of krill, which presents a higher quantity of calcium. The adult annual survival in South Georgia is reduced from 95 to 93% in the 1990's, coinciding with a reduction in the recruitment, from 35 to 5%.

The South Georgia birds feed basically on cephalopods (49% of the diet's mass, being 91% corresponding to the squid *Martialia hyadesi*), fishes (35%, being 1/3 of lamprey *Geotria australis*) and krill (17%). Annual variations occur, specially in relation to the use of this crustacean, but squids and fishes are dominant preys. The birds dive from the surface or while flying, reaching a minimum of 5m depth. There are reports of night feeding. In Brazil it seems that they don't follow the vessels constantly; however, at the proximities of Falklands/ Malvinas, the species is an active member between the other bird groups that search for fishery discards.

Breeding areas

It reproduces in the islands South Georgia, Diego Ramirez, Prince Edward and Marion, Kerguelen, Crozet, Macquarie and Campbell.

Dispersion and migrations

The individuals who nest at South Georgia feed in the oceanic waters, in an approximately 1,500 km radius from the colony. Individuals that were banded in this place have been recaptured or satellite tracked at the Falklands/ Malvinas, south of Africa (Benguela Current), south of Australia and north of New Zealand, suggesting a circumpolar migration, similar to the T. *melanophris* from the same archipelago (Prince et al., 1998). Birds nesting in Diego Ramirez tracked by satellite flew mainly to the west, remaining at south of 45°S. There are

occasional records in direction of the South Atlantic and the Falklands/Malvinas region. There are a few records confirmed in Brazil (São Paulo, Santa Catarina and Rio Grande do Sul), all being juveniles. Individuals are observed following longliners in the south of Brazil, but there hasn't been any confirmed capture.

Status

In Bird Island, the population - which corresponds to 15% of the South Georgia's total, and 56% of the world population - has been declining 19-29% since 1975/76, and the recruitment rate of juveniles dropped from 38 to 5%. At Prince Edward and Marion, the population (7% of the world total) declined 1.75% per year, until 1992, increased after that but currently seems to be stable. At Campbell, the population (7% of the world total) has been decreasing since the 1940's, and the three colonies have been reduced between 79 and 87%. The juveniles are more vulnerable to the capture by pelagic longliners.

Common Name: Sooty Albatross
Scientific Name: *Phoebetria fusca* (Hilsenberg, 1822)
Family: Diomedeidae
Conservation Status:
MMA (2003): No record
IUCN (2004): Endangered (A4bd)
CMS (2002): Appendix II

It is one of the most characteristic albatrosses, with a dark plumage (Fig. 24) and a long tail. It is similar to *P. palpebrata*, which also occurs in Brazil, being distinguished by its brown back, which is slightly lighter than the head and the neck (in the *P. palpebrata*, the contrast is much more evident and the back is pale-grey) and also distinguished by the yellow sulcus (blue or violet at *P. palpebrata*) in the mandible. It has a wingspan of approximately 2m. In Tristan da Cunha, males and females weigh, respectively 2,4-2,9 kg and 1,8-2,5 kg.

The breeding cycle lasts seven months and the couples nest biennially. The nests are built in steep places, like cliffs. In Tristan da Cunha, the adults return to the colonies in September and the first eggs are laid, in a synchronized way, in the first week of October. The incubation lasts around 71 days, and the pair takes turns that last from 1 to 21 days. One of the parents always stays with the nestling during the first 19-21 days and then the nestling is left alone, except when it is fed. The juveniles are fed until they fledge, what occurs approximately after 164 days after hatching; they are not abandoned by the parents, like the other species of albatrosses and petrels. The breeding success varies greatly between the years, presenting an average of 43% in the Crozet Islands. The average age for the first reproduction is 12-13 years and life expectancy is over 19.5 years. The adults survival varies between 89.9 and 96.7% and the juveniles' one is 22.4%.

Fabiano Peppes

Fig. 24 - Sooty Albatross *Phoebetria fusca*

The diet is not defined for the populations from the Atlantic Ocean. At Crozet, 70% of the nestling diet's mass is composed of fishes, 14% of squids, 13% of krill and 3% of carrion. At Prince Edward and Marion, the fishes represent

32%, the squids 32%, the crustaceans 23% and carrion 1% of the diet. The predated squids weigh between 100 and 300 g, but remaining of bigger individuals (5 kg), occurred in the samples. The species is one of the Procellariiformes with the most agile flight and is one of the albatrosses with greater diving capacity, reaching approximately 12m depths.

Breeding areas

In the Atlantic Ocean, the species nests in the islands Gough and Tristan da Cunha. It also it reproduces at the Prince Edward and Marion, Crozet, Amsterdan and Kerguelen islands.

Dispersion and migrations

Occurs at the north of the Subtropical Convergence (rarely reaches 16°S) and to the south, occasionally to 70°S, with great dispersion by the Austral Ocean. The two species of *Phoebetria* have distinct feeding areas, separated by the Antarctic convergence (50°S), with *P. fusca* using the waters on north of this Convergence. There is no information about migrations.

Status

The annual breeding population is estimated in around 12,500-19,000 pairs, equivalent to a total breeding population of approximately 42,000 individuals. The breeding pairs are estimated between 5,000-10,000 in Gough, 4,125-5,250 in Tristan da Cunha Islands, 1,539 in Prince Edward and Marion, 2,620 in the Crozet Islands, less than five in Kerguelen and 300-400 in Amsterdam. In Possession Island (Crozet), the population declined 58% between 1980 and 1995. In Marion, the decline was of 25% between 1990 and 1998. In Gough, the population seems to have declined 68% during 28 years.

Common Name: Southern Giant Petrel
Scientific Name: *Macronectes giganteus* (Gmelin, 1789)
Family: Procellariidae
Conservation Status:
MMA (2003): No record
IUCN (2004): Vulnerable (A4bcd)
CMS (2002): Appendix II

The species (Fig. 25) has a remarkable polymorphism of the plumage color, presenting distinct colors as the individuals become older. The majority of the individuals observed in Brazil are juveniles, with brown or soot coloration (what gave them the common name of 'urubu' [vulture] by fishermen) but there are also records of white individuals. The males are much bigger than the females, presenting a wingspan that varies from 2.07 to 2.44 m, in comparison with 1.80-1.83 m of the females. The average weight is 5 kg (for males) and 3.8 kg (for females).

The Southern Giant Petrel is distinguished from *M. halli* (which also occurs in Brazil)

Guillermo Moreno

Fig. 25 - Southern Giant Petrel *Macronectes giganteus.*

by the greenish tip of the bill, that it is reddish on the last one. However, when the animal is feeling hot, the bill can become reddish, causing problems in the identification. There are considerable variation in the morphometry and color between birds from different regions, and the populations from Gough and Faklands/Malvinas have their own characteristics, being considered as a distinct form: *M. giganteus solanderi*.

In South Georgia, the nesting process starts in October, with the formation of dispersal colonies that reach until 300 couples. The incubation lasts from 55 to 66 days and the fledging occurs after 104-132 days, when the young weigh 1.3 x more than an adult. The sexual maturity is reached when they are 6-7 years old and life expectancy exceeds 9.5 years.

Macronectes giganteus is the only petrel that is mainly predator and feeds on mammals and other seabird, one of the few that is agile at land. In South Georgia, the penguins constitute an important item of its diet during the breeding period (62-89% of the diet's mass); the other items are other seabird species, specially smaller petrels (6-9%), krill (1-21%), Sea Lions (1-6%), squids (1-2%) and fishes (1%).

Breeding areas

In the Atlantic Ocean it reproduces in two islands off the Chubut's coast (Argentina), States Island, Falklands/Malvinas, South Georgia, South Orkneys, South's Shetland, Gough and several islands close to the Antarctic Peninsula and to this continent. In other regions, it nests at the islands Kerguelen, Prince Edward and Marion, Heard and Macquarie.

Dispersion and migrations

The satellite tracking indicated that the South Georgia birds have foraging strategies sexually distinct: while the males stay in the archipelago region, feeding on dead penguins and dead marine mammals, the females may travel to continental shelf in the south of the Patagonian, obtaining food from the sea (González-Solís et al., 2000a).

Pos-reproduction adults seem to do not perform great dislocations, but the juveniles make circumpolar trips following the dominant winds. Individuals recorded in Brazil had been banded in the islands South Georgia, Macquarie, Signy (South Orkneys) and islands of the Antarctic Peninsula.

Status

The global population has been estimated in around 31,000 pairs since the beginning of the 1990's, which indicates a decline of 18%, comparing to the 1980's.

Fig. 26 - Oceanic distribution of Giant Petrels *Macronectes* spp.

Common Name: Southern Fulmar
Scientific Name: *Fulmarus glacialoides* (Smith, 1840)
Family: Procellariidae
Conservation Status:
MMA (2003): No record
IUCN (2004): No record
CMS (2002): No record

The species (Fig. 27) presents a wingspan of approximately 1.2 m and weighs 800 g.

The nesting starts in October, being highly colonial. The nests are built in rocky crevices and the egg laying occurs in November/ December. The incubation lasts around 46 days. The juveniles leave the nest 48-56 days old and start to disperse in March and April. The adult life expectancy is about 12.8 years and the adult survival rate varies between 90 and 95%

Tony Palliser

Fig. 27 - Southern Fulmar *Fulmarus glacialoides*

They feed basically on crustaceans (krill), fishes and squids, and the proportion depends on the region. The pelagic fish *Pleurogramma antarcticum* is an important prey. They also feed on carrion and fishery discards.

Breeding areas

They nest at several Antarctic localities and in the islands South Georgia, South's Shetlands, South Orkneys, South Sandwich, Bouvet and Peter.

Dispersion and migrations

Distributed widely through the Austral Ocean. The juveniles reach subtropical latitudes, following the cold currents such as the Falklands/ Malvinas and Benguela; occasionally, there is great mortality along the Brazilian coast, in São Paulo and Rio Grande do Sul States, apparently associated to these dislocations.

Status

The species is not threatened. The only monitored population indicates a high inter annual variation, with an increasing tendency (Woehler et al., 2001).

Fig. 28 - Oceanic distribution of the Southern Fulmar *Fulmarus glacialoides*

Common Name: White-chinned Petrel
Scientific Name: *Procellaria aequinoctialis*
Family: Procellariidae
Conservation Status:
MMA (2003): Vulnerable (A4bcde)
IUCN (2004): Vulnerable (A2bcde + 3bcde)
CMS (2002): Appendix II

Fabiano Peppes

Fig. 29 - White-chinned Petrel *Procellaria aequinoctialis.*

The species presents a dark-brown uniform plumage, clear bill and a white chin spot of variable extension, occasionally absent (Fig. 29). The wingspan is about 1.3-1.4 m and weighs until 1-4 kg (male) and 1.3 kg (female). At the breeding colonies, it shows nocturnal behavior. They nests in long burrows, digged under scrub and cyperaceous bushes. The birds vocalize to attract their partners. They arrive in South Georgia in September and the first eggs are found later in the middle of November. The incubation lasts around 59 days and eggs hatch in January. The nestlings reach the maximum weight approximately

when they are 82 days old, when they weigh more than the adults, and then they are abandoned. The juveniles leave the nests with 98 days. The breeding success varies between 12 to 54% (Hall, 1987).

The monitoring of the species generated diving records of up to 13 m, with submersions for until 45 s (Huin, 1994). In South Georgia, during the breeding period, it feeds basically on krill, fishes of the family Myctophidae and oceanic squids (mainly *Martialia hyadesi*), indicating that there is night foraging, what is supported by the observations made from longliners. At the Benguela Current region, the birds out of the breeding period feed basically on fishes (50% of the diet's mass), crustaceans (13%) and squids (11%) actively captured, besides the other 21% composed by the fishes discarded by trawler vessels.

Breeding areas

On the Atlantic Ocean, it nests in the islands Falklands/Malvinas and South Georgia. It also breeds in islands Prince Edward and Marion, Crozet, Kerguelen, Auckland, Campbell, Antipodes and perhaps at Macquarie.

Dispersion and migrations

Birds nesting in South Georgia make trips of 12 to 15 days during the incubation period, traveling between 3,000 and 8,000 km in order to search for food and dislocating to the north of Falklands/Malvinas and the coastal waters of the north and south of Argentina. Trips are shorter during the nestling care, taking between 2 and 11 days and with a dislocation of 1,100 to 5,900 km; thus, these seabirds feed at the continental shelf near to the colony and to the South Orkney, South Shetland and along the south Brazilian continental slope up to the Falklands/Malvinas (Berrow et al., 2000b).

The increasing number of recorded individuals of this species along the South American continental shelf (including Brazil up to 23°S) and Benguela Current suggests that post-reproduction migrations for that regions occur, but is not confirmed yet.

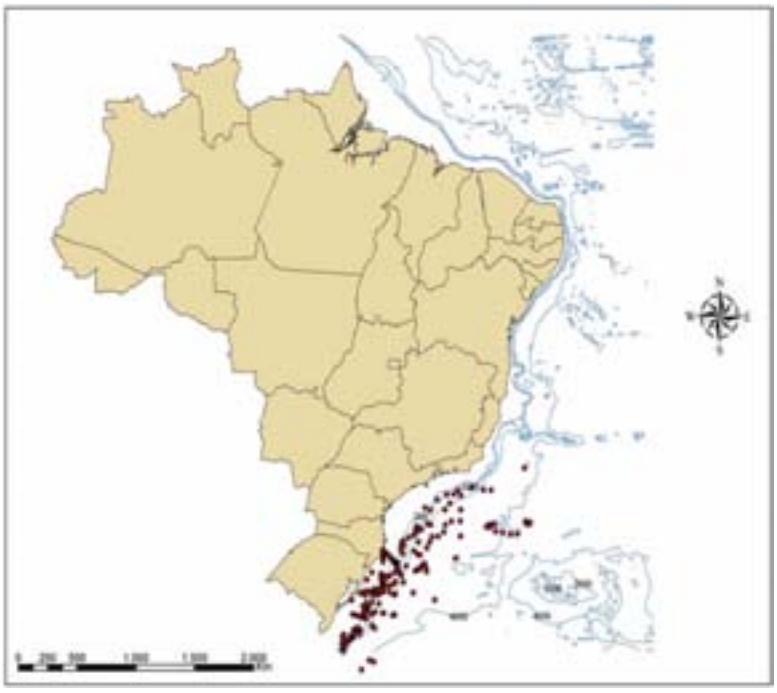


Fig. 30 - Oceanic distribution of the White-chinned Petrel *Procellaria aequinoctialis* from observations on board of longliners

Status

The CCAMLR scientific committee estimates that at only at the region at the south of the Antarctic Convergence, up to 138,000 White-chinned Petrels were killed by illegal longliners in the last three years. This is also the most captured seabird by the Brazilian pelagic longliners. In South Georgia, where the population was estimated in 2 million couples in the 1980's, there was a 28% decline of occupied nests between 1981 and 1998 (Berrow et al., 2000a). The population in Falklands/Malvinas is evaluated between 1,000 and 5,000 couples.

Common Name: Spectacled Petrel
Scientific Name: *Procellaria conspicillata* Gould, 1844
Family: Procellariidae
Conservation Status:
MMA (2003): Endangered (B1ab)
IUCN (2004): Critically Endangered (B1ab[v])
CMS (2002): Appendix II

This species is similar to *P. aequinoctialis*, distinguished by the white facial mask (Fig. 31), which presents a variable format and extension, visible at the nestling stage, and also for having a minor morphometry. The weight, wich varies between 1.01 to 1.3 kg (1.2 kg on average), is significantly minor than the South Georgia White-Chinned Petrels'.

Fábio Olmos

Fig. 31 - Spectacled Petrel *Procellaria conspicillata*

The Spectacled Petrel, as well as the *P. aequinoctialis*, digs tunnels for breeding, which are often build in flooded soil, near by creeks and drains, and with a puddle at the entrance. They lay the eggs in the beginning of October and most of them hatched later in the middle of December. The juveniles leave the colony in March and April.

They feed on cephalopods, decapod crustaceans and fishes. They have good diving capacity; some birds were observed diving at least 6 m deep in order to obtain longlining discards (Fig. 32). It seems to be more diurnal than *P. aequinoctialis*.

Breeding areas

The only breeding population occurs in the Inaccessible Island. Apparently, it also reproduced at Amsterdam Island, what explains the records made in the Indian Ocean during the 19th century.

Fábio Olmos

Fig. 32 - Spectacled Petrels *Procellaria conspicillata* feeding on fisheries discards

Dispersion and migrations

During the summer, it is the most common species among the birds that follow bottom longliners over the south and southeast continental shelf in Brazil, probably individuals out of their breeding period. During the winter, when the waters are colder, they practically disappear from those regions, being substituted by *P. aequinoctialis*. The number of the individuals over the warmer and saltier waters of the Brazilian Current, out of the continental slope, in this period, is superior to those over the shelf during the summer (Olmos, 2001).

The waters outside the Brazilian continental shelf seem to shelter the largest concentration of this species away from its reproduction area, but also, there are concentrations, although smaller, outside of South Africa continental shelf, in waters of high salinity under the influence of Agulhas Current (Camphuysen, 2001).

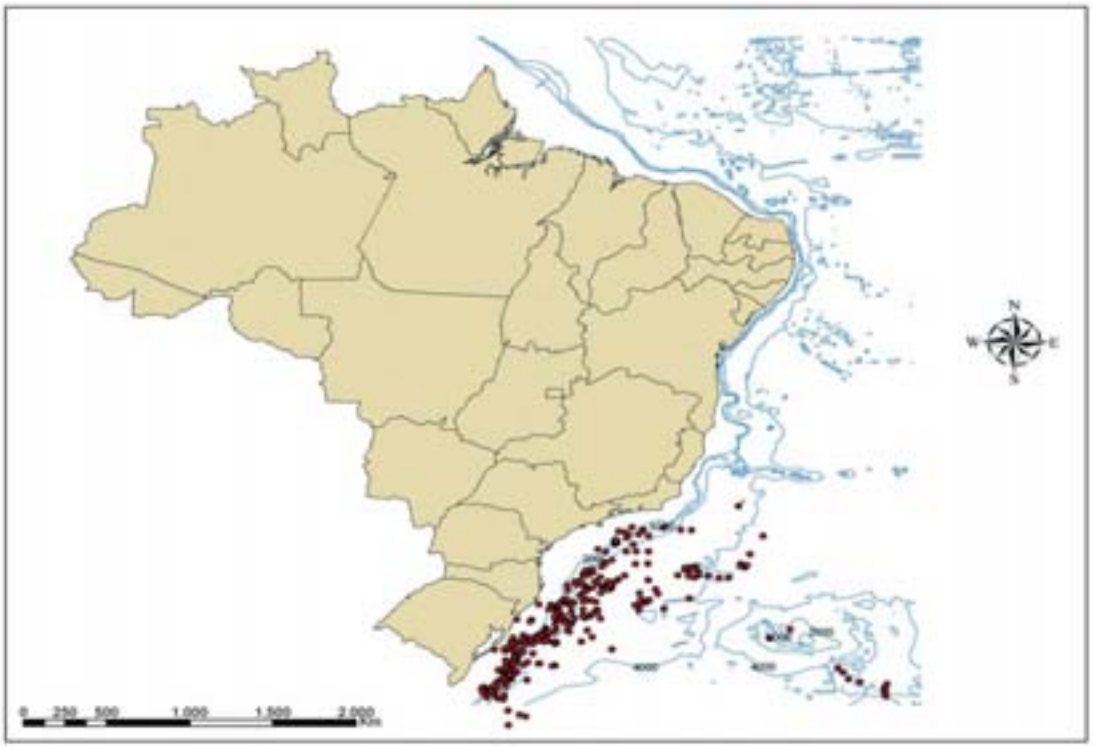


Fig. 33 - Oceanic distribution of the Spectacled Petrel *Procellaria conspicillata*

Status

In 1999, the population was estimated in 3,800-4,600 breeding pairs (Ryan & Moloney, 2000).

Common Name: Great Shearwater
Scientific Name: *Puffinus gravis* (O'Reilly, 1818)
Family: Procellariidae
Conservation Status:
MMA (2003): No record
IUCN (2004): No record
CMS (2002): No record

The species (Fig. 34) presents a wingspan that varies between 1 and 1.18 m and weighs between 715 to 950 g. It nests in burrows digged in the ground, under bushes of grass and cyperaceous. Despite being very active at night, it was also found exhibiting and digging nests during the day. They arrive at the breeding colonies in August and in the subsequent month there is a large number of birds occupying the burrows. Apparently, they lay their eggs mostly in November, but there are records of egg laying throughout the austral summer. The incubation takes 53-57 days and the nestlings leave the nests at approximately 105 days old. The juveniles start to fly in May, leaving the colonies in this period (Rowan, 1952).

P. gravis often interacts with dolphins and whales to feed. They may dive down to 10 m and stay submersed during 12 s.

Breeding areas

This species nests in Tristan da Cunha Archipelago (Inaccessible and Nightingale) and in Gough. There is a small population in Falklands/Malvinas Islands (Kidney Island).

Dispersion and migrations

Puffinus gravis is an intertropical migrant who leaves the South Atlantic after breeding, quickly migrating to the North Atlantic in April/May along the west coast. At Falklands/Malvinas it arrives in large numbers from December to April, and it seems to be more common out of the Brazilian coast in April and May (when then migrate to the north) and November, what indicates a predominance of non breeding individuals. The return to the south seems to be along Central and the Western Atlantic Ocean. Non breeding individuals seem to remain in winter areas and along migratory routes throughout the year.

It is the most captured species by bottom longliners, and a large number occurs in May, coinciding with the juvenile migration to the north.

Status

In the 1970's, the Nightingale and Inaccessible population was estimated in 5 million pairs, and in Gough between 600 thousand and 3 millions pairs. Only 50-100 couples nest in Falklands/Malvinas. The species is not threatened.

Fábio Olmos

Fig. 34 - Great Shearwater *Puffinus gravis*

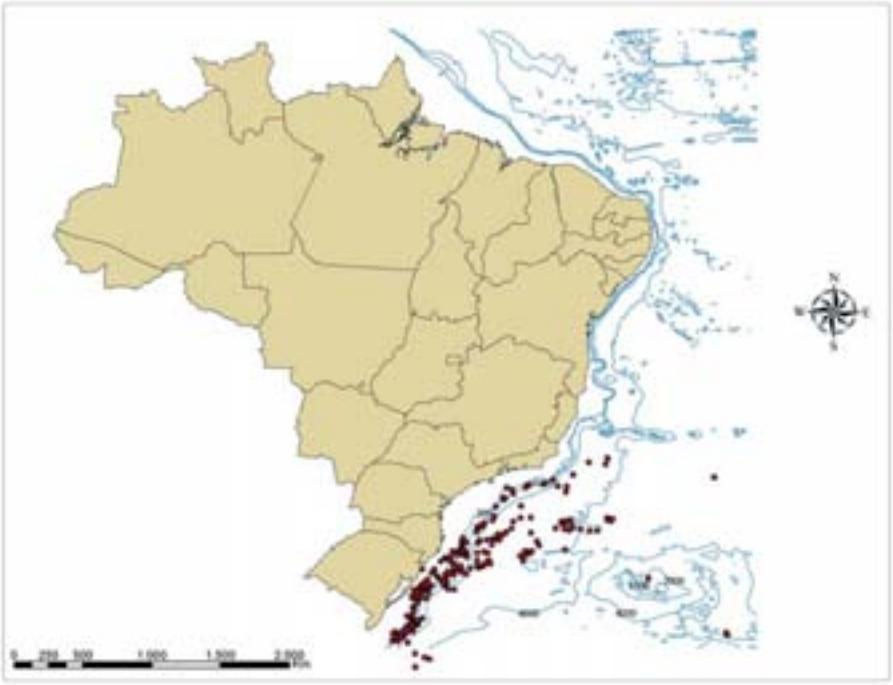


Fig. 35 - Oceanic distribution of the Great Shearwater *Puffinus gravis*

The fisheries techniques that capture seabirds in Brazil

The concept of fisheries used in this NPOA-Seabirds Brazil is in accordance to Marcovaldi et al. (2002): "a fishing activity performed in a determinate area, using a specific equipment which interacts with birds (or sea turtles), aggregated by the homogeneity principle, which is based on twelve parameters: fishing equipment; fishing vessels; fishing area, fishing effort, logistic aspects, ports of disembark, institutional interfaces, involved fishermen categories, target-species, laws concerning this issue, fishing potential and effort unit".

The base of such concept is the establishment of management units. Such model, as it has been used by the Projeto TAMAR/IBAMA, is suitable for the monitoring of sea turtles capture, through samples, producing estimates on capture rate per effort unit (CPUE), with errors statistically testable (Sales et al., 2003).

Based on the previous principle, we consider, hereby, eight fisheries that affect the seabirds, being four of them considered priorities:

- The pelagic (or surface) longline fisheries conducted by the vessels based on the ports of the South and Southeast region.
- The pelagic longline fisheries conducted by the domestic and leased fleet based on the ports from the North and Northeast region.
- The bottom longline fishery.
- The surface longline fishery for the capture of the Dolphin Fish, used mostly by the fleet from Itaipava port, Espírito Santo State

Despite the seabirds mortality associated with fisheries is historically related to the longline fisheries (pelagic and bottom) conducted by the domestic and leased fleet, other fisheries modalities - such as lived baits fisheries, gillnets, trawlers, driftnet - have demonstrated to be a potential factor for its mortality, and are here included as potentially relevant fisheries whose incidental capture rates must be evaluated.

The ones that have a possible impact to bird populations at the Brazilian coast are the gillnet for the Monkfish fishery (*Lophius gastrophysus*) and associated species. Birds are captured during settings, because they are attracted to the living organisms that got adhered to nets during previous fishing. Captures of *Procellaria aequinoctialis*, *P. conspicillata* and *Fulmarus glacialoides* have been registered along the Santa Catarina's coast (F. Peppes, personal observation).

The pelagic (or surface) longline fisheries conducted by the vessels based on the ports of the South and Southeast region.

This fishery (Fig. 36) is conducted by domestic and leased longliners based at the South and Southeast ports (Santos, São Paulo State; Itajaí, Santa Catarina State and Rio Grande, Rio Grande do Sul State). These activities started in Brazil in 1958, introduced by the Japanese, and suffered several interruptions and technological alterations.

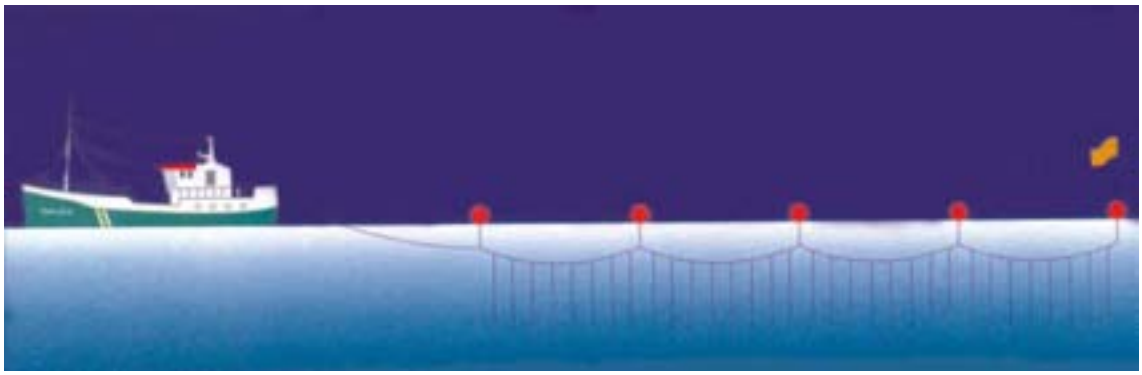


Fig. 36 - Pelagic longline operation

Since 1994, the vessels operating in the Brazilian EEZ changed the Japanese longlining fishing model - that was heavier, needed a larger crew and targeted the Tuna Fish - for the American model, lighter, targeting mainly the Swordfish (*Xiphias gladius*). It is noted an increase of the fleet dedicated to this activity, with a bigger participation of leased fleet from 1992 to 1996 and from 2001 to 2003 (Fig. 37).

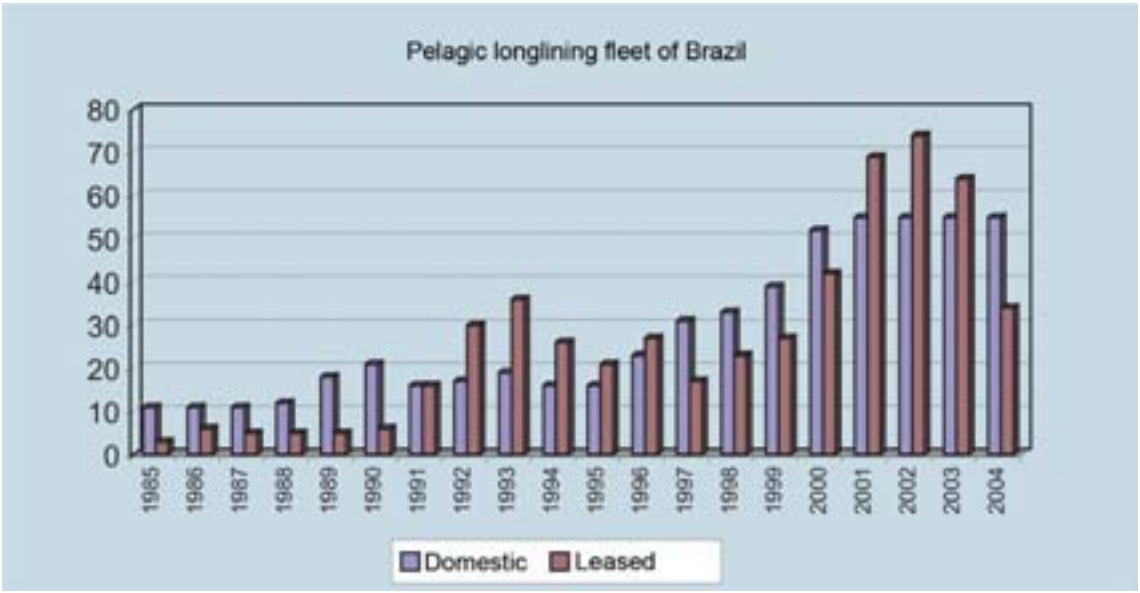


Fig. 37 - Evolution in the number of leased and domestic pelagic longline vessels operating in Brazil between 1985-2004 (Source: Travassos & Hazin, 2004, 2005; www.setorpesqueiro.com.br)

The fishing gear currently used in Brazil, known as pelagic longline or, as known in Brazil, "meia-água", consists of a main line of polyamide monofilament, with around 80 km length, in which are attached 800 to 1,200 baited hooks in secondary lines, with metal

snaps. The set sinks slowly down to about 45-80 m depth, less than 70-120 m of the Japanese longline (Olmos et al., 2001). The vessels with this equipment capture species like the Swordfish (Fig. 38), Yellowfin Tuna (*Thunnus albacares*) and sharks, while deeper longlining have as target-species the Atlantic Albacore (*T. alalunga*) and Bigeye Tuna (*T. obesus*). The bait is the Argentinean Squid (*Illex argentinus*), generally imported from Argentina and Uruguay. Sardines (*Sardinella brasiliensis*) and the Pacific Chub Mackerel (*Scomber japonicus*) are also used, as well as baits imported from the South American countries on Pacific coast.

Fábio Olmos

Fig. 38 - Swordfish hauling

Light sticks are attached to the secondary lines to attract fishes and the longline setting is done right after the sunset to take advantage of the main target-species behavior, the Swordfish (Olmos et al., 2001). During the summer, however, the sunset occurs later, specially at the high latitudes, and then the setting starts during daylight, in order to avoid that the job, which lasts on average, 5h22min (Azevedo, 2003; Projeto Albatroz, personal observation), extends until late at night. The fleet that operates with the pelagic longline and is based at the ports of the South and Southeast Brazilian region is, mainly, composed by domestic vessels, and the proportion of the domestic and foreign vessels greatly varies during the years. (ICCAT, 2002) (Fig. 39).

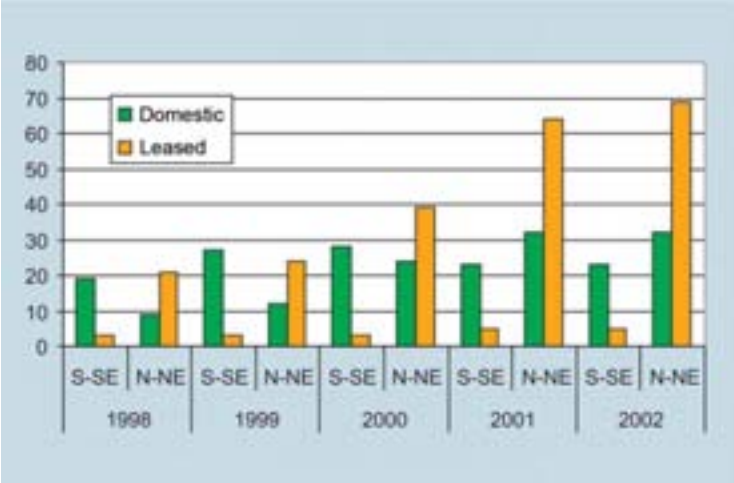


Fig. 39 - Evolution in the number of leased and domestic pelagic longline vessels operating in the South/Southeast and North/Northeast regions between 1998-2002 (Source: Travassos & Hazin, 2003)

The Brazilian total fisheries production recorded in 2004 was 44,642.1 t of Tuna, billfishes, sharks and other fish species of minor commercial importance. These values represent a decrease of 8.6% in the production, when compared with data obtained in 2003 (48,828.4 t). Only 43% of this production was deriving from the pelagic longline fisheries, and the fisheries with rod and live baits was responsible for the remaining (57%) (Travassos & Hazin, 2005). Considering only the fisheries production from the pelagic longline, the 2004 data pointed out a decrease of 32.7% when compared to the results obtained in 2003. Also, the number of vessels has declined, from 119 in 2003 to 89 in 2004, which represents a decline of 25.2% (Travassos & Hazin, 2005).

The main fishing areas for this fleet is concentrated in three major regions: along the coast of São Paulo, Santa Catarina and Rio Grande do Sul States; at the Rio Grande elevation and at the Hunter Channel and, in a minor scale, at the submarine chain of Vitória-Trindade (Azevedo, 2003). The area is chosen by the skipper in an empiric way, and there are several factors that determine the choice, such as sea surface temperature, depth and the period of the year. Anyhow, the distribution of the fishing effort of the

national fleet from the South and Southeast seems to be, among all the fisheries considered here, the one that is most similar to the birds' distribution. For this reason, even using less quantity of hooks, this fishery is considered, together with the North and Northeast leased fleet, the one who offers higher risks of seabird incidental captures.

Although this fishery is highly directed to Swordfish and Tuna fish, the capture of the Blue-Shark (*Prionace glauca*) by the domestic fleet, based at ports of south and southeast Brazil has been relevant when compared with the total capture, corresponding to 15,7% (1,568.3 tons) of the total in 2004 (Travassos & Hazin, 2005) (Fig. 40). Considering the seasonality, this proportion may increase even more, reaching the majority of the capture.

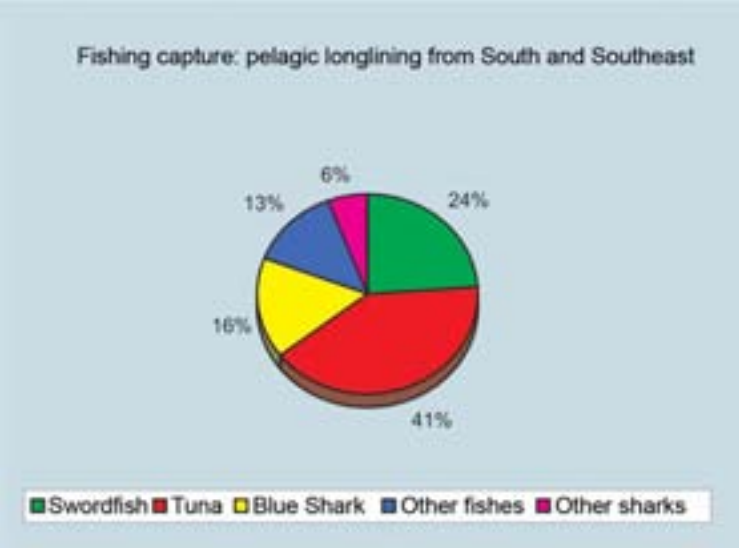


Fig. 40 - Fishing captures composition by the domestic pelagic longline, in 2004 (Source: Travassos & Hazin, 2005)

Azevedo (2003) observed that during four cruises (50,100 hooks or 49 sets) conducted by vessels from Itajaí, Santa Catarina State, 50.39% of the captures corresponded to Blue Sharks, and the cruise carried out in the summer captured, alone, 66.4% of the individuals. According to Hazin et al. (2000), only in the Atlantic Ocean, approximately 2 million individuals of this species are annually captured. Considering the high capture rate and its vulnerability, due to the biological characteristics such as long life cycle, slow growth and low fecundity, Azevedo (2003) concluded that it is necessary to adopt management measures focusing this resources' conservation. Conversely, the sharks capture (Fig. 41) plays an important role for the fisheries maintenance, specially if we consider the policy adopted for the fin production distribution between industries and crew, because the salaries of the fishermen are paid almost entirely by this production.

Fábio Olmos

Fig. 41 - Sharks taken aboard

Apparently, the national fleet do not perform the fining, a cruel practice forbidden in Brazil (Edict IBAMA n° 121, from 08/24/1998) that consists in discards of live sharks after the removal of fins, which are highly quoted in the international market. Brazil, in contrast to several other countries, values the meat from the Blue Sharks in the internal market, which allows the commercialization of the meat, avoiding fining (Azevedo, 2003).

The pelagic longline fisheries conducted by the domestic and leased fleet based on the ports from the North and Northeast region.

In 2004, 89 vessels were registered in Brazil, being 34 leased and 55 national (Fig. 37). Out of those, 19 were registered in Recife port (Pernambuco State), 8 in Cabedelo (Paraíba State), 48 in Natal (Rio Grande do Norte State), 2 in Rio Grande (Rio Grande do Sul State), 1 in Itajaí (Santa Catarina State) and 11 in Santos (São Paulo State) (Travassos & Hazin, 2005).

The number of the leased vessels registered in the ports from the North and Northeast has drastically decreased between 2002 and 2004. At Cabedelo, per example, from the 37 vessels operating in 2002, only eight remained. There was, however, an expectation of reversing this situation by making the foreign vessels become national, by opening of new leasing and constructing of new national vessels. During interviews carried out with the ship-owners of the above mentioned ports, the expectancy was to restore the previous number of vessels, or even a larger number. In Bahia State, where there isn't a significant industrial pelagic longlining fleet, the objective is to introduce foreign vessels. However, the expectancy of retaking the fleet's increase did not happen: in 2005, only 35 leased vessels had permits issued by SEAP in Brazil.

The leased vessels may present other longline artifacts different from the monofilament used by national vessels, which is the case of the FV Auster (Fig. 42) which uses a Spanish system with the main line made of braid polyamide and equipped with 2,000 hooks. It is unknown what is the impact of such artifact on the seabird populations. Therefore, the On Board Observers National Program (PROBORDO) is essential for the description of the used techniques, the fishing areas and influence of such fleet over the species incidentally captured.

Fabiano Peppes

Fig. 42 - FV Auster, leased pelagic longline vessel

Despite the fact that the longline fisheries conducted by the foreign vessels are based in its majority at the north and northeast ports of Brazil, it may be highly interacting with albatrosses and petrels that are concentrated at the south and southeast coast. The great autonomy of the vessels, associated with the type of fishing storage (which are frozen in cold chambers) allows the fisheries from low latitudes at the North Hemisphere until the end of the Brazilian south coast. The fishing effort distribution of the leased fleet in Brazil depends on the period of the year and the target-species. Thus, in the case of the vessels with permission for Tuna fishery, whose target-species are the albacores, the fishery is done mainly at the north of 20°S, directing the fisheries to the Bigeye Tuna (*T. obesus*), usually in the period between October and April. Between May and September, the fisheries are concentrated at south of 20°S, when the target is the Atlantic Albacore (*T. alalunga*). This is done by alternating the longline configuration, generally with the increase or decrease in the number of the secondary lines, and searching for depth levels with bigger concentration of each species.

When the fisheries target the Bigeye Tuna, the most used longline configuration is between 15 and 18 secondary lines per longline unit, whereas for the Atlantic Albacore it is often used between 7 and 12 secondary lines. The fishing operation starts with the longline setting at dawn and its hauling starts around 10-11 AM.

For the vessels licensed to the Swordfish's fishery, the used configuration is of 4 secondary lines per longline unit. The longline setting is at the dusk and the hauling is at dawn, between 5-6 AM. The operation pattern of these vessels, regarding the distribution of fishing effort, per area and period of the year, is very similar to those who are licensed for the Albacores fishery.

Only by implementing a monitoring program using on board observers, it will be possible to understand the importance of this fleet for seabird conservation.

At the end of 2003 the SEAP created an edict (IN n° 3, from 09/19/2003), that normalized the new leases and forbade the leasing of vessels that practiced Illegal, Unregistered and Unreported (IUU) fisheries, which were included in the ICCAT and CCAMLR lists.

The Decree n° 4.810, from 08/19/2003 established rules for the operation of the fishing vessels in the Brazilian fishing area, making mandatory the presence of observers on board for the entire leased fleet in Brazil. Besides that, the official edict of convocation of new leasing, published in October 2003, accepted applications for 48 new requests and determined the evaluations criteria, including, among them, the use of the measures or equipment for the mitigation of the incidental capture of seabirds and sea turtles.

The bottom longline fishery

The bottom longline fisheries (Fig. 43) currently performed by the national fleet was introduced in 1994 by fisheries research cruises from the RV Orion of IPSP. Despite the fact that fisheries directed to the Snowy Grouper (*Epinephelus niveatus*), the Namorado Sandperch (*Pseudopercis* spp.) and the Tilefish (*Lopholatilus villarii*), performed with bottom lines, are historically used in Brazil, these researches allowed the introduction of steel cables and hydraulic cranes, becoming a technological support which culminates on the establishment of a national fleet capable to accomplish captures down to 600 m depth (Ávila-da-Silva & Bastos, 1999; Silva, 2000; Tutui et al., 2000; Ávila-da-Silva et al., 2001; Ávila-da-Silva, 2002).

The vessels that use the bottom longline (Fig. 44) are adapted from older trawler vessels, having wood hulls, with a length between

Fábio Olmos

Fig. 44 - FV Mar Paraíso, bottom longline operator

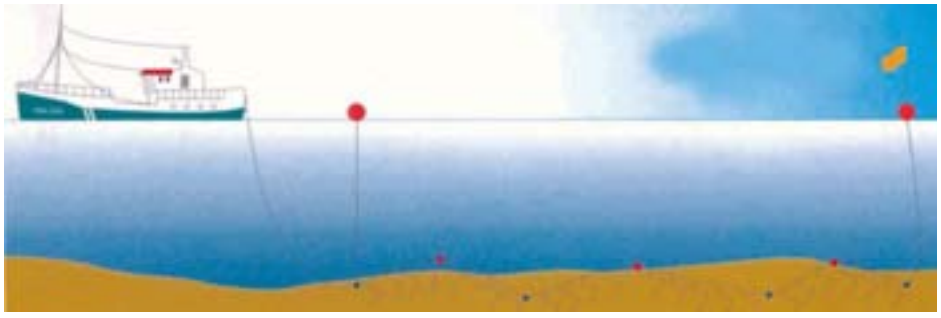


Fig. 43 - Operation of a bottom longline vessel

15 and 23.6 m, and engine of 156 to 350 HP (Ávila-da-Silva et al., 2001). On board the fishes are kept in ice storage basements and the trips take 10 to 15 days, with a crew of 5 to 9 people. The main steel cable line is 6 to 7 nautical miles long and 4.5 to 8 mm in diameter; the secondary lines are 90 cm long and the distance between them is about 6 to 10 m (Ávila-da-Silva et al., 2001; Haimovici & Velasco, 2003). The hooks used are circular with the spear point turned inward, like the Mustad Tuna Circle type nº 13, with 3 mm diameter and 30 mm opening.

The longline has 1,500 to 2,000 hooks and it is set two or three times per day. The preferred bait is the Argentinean Squid (*Illex argentinus*, the same used on pelagic longlining), but whereas in pelagic longline fisheries the entire bait is used, at the bottom longline the bait is used in peaces. Parts of fishes of low commercial value, such as the *Helicolenus lahillei*, Gulf-hake (*Urophycis cirrata*) and Dogfishes *Squalus* spp. and *Mustelus* spp. can also be used as baits (Haimovici & Velasco, 2003). The settings are usually diurnal to avoid interactions with the isopod crustaceans *Politolana* sp. and *Bathynomus giganteus,* which have nocturnal feeding habits and forage on dead fishes near the bottom, what can cause great losses to the fisheries (Rodrigues, 1997; Ávila-da-Silva et al., 2001).

The bottom longline fisheries, as it is conducted in Brazil, target a few species, like the Tilefish, Snowy Grouper and Namorados. Since 1999, the White Sea Catfish (*Genidens barbus*) and the Whitemouth croaker (*Micropogonias furnieri*), which are captured at very shallow depths (less than 80 m), also became target-species (Ávila-da-Silva et al., 2001; Ávila-da-Silva, 2002; Haimovici & Velasco, 2003).

The Tilefish and the Snowy Grouper are the most abundant species captured and just as the other species that live at the demersal regions of deep waters from the continental shelf, present slow growth, high longevity, late maturity and has low natural mortality rates, what makes them extremely vulnerable to exploitation (Dayton et al., 1995; Coleman et al., 2000 apud Ávila-da-Silva, 2002). Haimovici & Velasco (2003), who analyzed the bottom longline fleet in operation at the Brazilian south and southeast coast between 1997 and 1998, registered the presence of 42 vessels, being all national, except the FV Solgun, of Norwegian origin and licensed to fish in Brazilian waters. The ports used by these vessels are mainly Santos (São Paulo), Itajaí (Santa Catarina) and Rio Grande (Rio Grande do Sul).

In the south and southeast of Brazil there has been a decline in the number of vessels that use this fishery, and there is a supposition that it could be almost extinct in a near future. Such fact is associated more to the low profitability of this fishery (due to the fast decline of explored stocks) than to the legal restricting factors. As a consequence, there has been a decrease in the impact on the seabird populations that interact with this fishery in Brazil. However, because of the high index of captures recorded in 1998 – when the annual average fishing effort was about 17.7 millions of hooks, causing the capture of 4,214 (between 2,201 and 6,226) seabirds per year (Olmos et al., 2001) – the bottom longline fishery must be monitored to evaluate the capture of seabirds, and the licensing of new foreign vessels must be rigid, including the obligation to use mitigation measures as used by similar fisheries, like paired torilines.

The surface longline fishery for the capture of the Dolphin Fish, used mostly by the fleet from Itaipava port, Espírito Santo State

The fleet based at Itaipava port, located at the municipality of Itapemirim (Espírito Santo State), as well as the fleet based at the neighbor cities of Piúma, Anchieta and Vila Velha, comprise about 290 vessels and at least 250 are connected to the radio station installed at Itaipava Fishermen Association (Gilberto Raposo, Chief of the Fishing

Department from Itaipava city hall, pers. comm.). According to him, about 70% of the fleet uses Itaipava port in a regular basis, whose fishery production is responsible for 50% of the total fishery production of Espirito Santo: 12,300 t per year.

Despite the fact that this fishery origins at the port of Espirito Santo, the range of operation is very wide, from the northeast coast down to Rio Grande do Sul State, being, therefore, disseminated. The vessels used are of small and medium sizes and have a low operation cost, what is stimulating the operation, in other ports, of new vessels using this type of fishery. Therefore, studies listing and describing the characteristics of such vessels and its fishing artifacts, as well as its operation practices, are actions that demand urgent attention from the Brazilian fisheries authorities.

The vessels length between 10 to 15 m and are equipped with engines of 90 to 130 HP, having a load capacity of 12 to 13 tons of fish. The autonomy is around 12 to 20 days and they takes 6 to 8 crew members. Most of the vessels are equipped with Global Position System (GPS), sonar and radio. There are 3 fisheries arts practiced by the fleet, all of them using hooks: a) trolling lines; b) longlining (surface for Dolphin Fish, and pelagic for Swordfish); and c) bottom line or hand line.

Many times, such fisheries modalities are used simultaneously. The longlines for Dolphin Fish and Swordfish are used by the same vessel during the same cruise, respectively during the day and during the night. These two fisheries arts are the most concerning regarding seabird incidental captures.

According to fishermen, during the Dolphin Fish fishery, the baited hooks float on the surface all the time, which makes them available for seabirds during all the fishing operation. Around 800 to 1,200 hooks are used and the equipment is set only once. After setting, the longline is checked periodically, when fishes are removed and new baits are placed. According to fishermen, seabirds are captured quite often, what makes their work difficult. Normally they find the birds alive, struggling on the surface trying to set free, but because the difficulty to free them from the hook, the fishermen usually kill them.

Two cruises were made with on board observers from Projeto Albatroz at vessels from Itaipava, with the objective to describe, in detail, the interaction of seabirds with this fishery. However, in both cases, these cruises did not targed Dolphin Fish or Swordfish. The vessels are equipped with all different fishing gears, but the choice of the one that will be used is made at sea, which difficults the monitoring for longlining. In none of the cruises birds' captures occurred, but the observers recorded individuals of Black-browed Albatross *T. melanophris*, White-chinned Petrels *P. aequinoctialis*, Great Sheawaters *P. gravis*, Terns *Sterna* spp. and Skuas *Stercorarius* sp. It is important to note that this fleet operates in a potential occurrence area of the Trindade Petrel *P. arminjoniana*, which is classified as a Threatened Species by MMA (2003).

On another cruise, without on board observers, the skipper agreed to test the bait dyeing, but the method used wasn't adequate and the test became unviable.

More studies are necessary, specially on board observations, for an adequate description of the fishing gears and the fishing methods, as well as the occurrence of incidental captures and the use of mitigation measures.

In the Itaipava fishing community, the fishermen's sons tend to continue on the fisheries, and in Piúma there is a fisheries school for them (they are at the elementary and high school) which has a strong influence over the fleet, preparing new skippers and giving continuity to the local fishing tradition. The tradition of the "linheiros" skippers from Itaipava became notorious, and this community started to influence other Brazilian regions, specially regarding the demersal fishery with line. Since Itaipava has a consolidated fishing community, the region is propitious to the development of educational projects concerning fisheries.

The incidental seabirds' capture by the domestic longline fleet in Brazil

Bottom longline

The available data on seabird mortality by bottom longliners were obtained between April 1994 and May 1995, through the RV Orion, and during cruises in August 1996 and June 1997, through FV Margus II, as a part of the REVIZEE Program, which has a national and inter-institutional coverage, involving the CIRM and research and educational institutions like the IPSP, Oceanographic Institute/USP and FURG (Olmos et al., 2001; Olmos & Bugoni, in press).

During 19 cruises carried out, the RV Orion set 340,777 hooks, with a total of 157 fishing days, operating over the continental shelf and the upper continental slope between 19°30'S and 27°56'S. Fishing at depths from 49 to 468 m, there was a capture of 109 seabirds (0.32 seabird/1,000 hooks), from which 49 were collected for identification (Neves & Olmos, 1998; Tutui et al., 2000). The main species captured was the Great Shearwater *P. gravis* (34 individuals), followed by the Yellow-nosed Albatross *T. chlororhynchos* (6), White-chinned Petrel *P. aequinoctialis* (6), Spectacled Petrels *P. conspicillata* (2) and Black-browed Albatross *T. melanophris* (1).

The 12 cruises of FV Margus II were carried out between Rio de Janeiro and Rio Grande do Sul States (22°00'-34°40'S), in depths from 100 to 500 m. The effort used was 187,908 hooks during 69 fishing days, resulting at the death of 19 seabirds (0.1 seabird/1,000 hooks), from which 15 were identified, being the most captured species: *P. gravis* and *P. aequinoctialis* (5 individuals each), *T. melanophris* (4) and *P. conspicillata* (1).

As no attempts were done to prevent these captures, the outstanding difference between cruises of the RV Orion and FV Margus II may be attributed to two factors: a) the RV Orion operated mainly at well known fishing areas and in a limited depth stream, while the cruises of FV Margus II operated on a larger area, in a systematic way, setting at parallel batimetrical transects which not always corresponded to the fishing areas. The known fishing areas, in which RV Orion operated, may have coincided with the preys aggregation, like squids and small fishes which are exploited by the birds and where they could be congregated; b) The RV Orion captured 46 from the 109 seabirds between May and June in the Cabo Frio (Rio de Janeiro) region, coinciding with the migration of the Great Shearwater *P. gravis* (the most captured bird) to the North Atlantic Ocean. This species is a trans-equatorial migrant that leaves the waters from the south of Brazil during the winter (Vooren & Brusque, 1999).

The Cabo Frio region has the richest primary productivity on the southeast coast of Brazil, due to the upwelling, and it is probable a feeding area for the migrant seabirds. *Puffinus gravis* is a skilful diver, capable of catching preys at many meters of depth, which is an important factor for the selection

of the captured seabirds, due to the fast submersion of the longline. This was the most captured species, even though represented a maximum of 20% of all the observed seabirds around the vessels (Olmos, 1997), showing that the fishing technique is selective concerning the captured birds.

Based on the data from the fleet from Santos, it is known that the 35 bottom longliners operating in the Brazilian EEZ, until 1998, used an average annual fishing effort of around 17.7 million hooks. Using the capture rates from RV Orion and FV Margus II as parameters, this effort corresponds, on average, to 4,214 (from 2,201 to 6,226) dead seabirds, per year.

So, and also considering the average for each species obtained by the sum of all the captured birds from both researches, it can be estimated that, for the mid 1990's, the bottom longlining Brazilian fleet has captured around 2,568 (1,341-3,794) *P. gravis*, 724 (378-1.070) *P. aequinoctialis*, 197 (103-292) *P. conspicillata*, 395 (206-584) *T. chlororhynchos* and 329 (172-486) *T. melanophris*, per year, at the EEZ (Fig. 45).

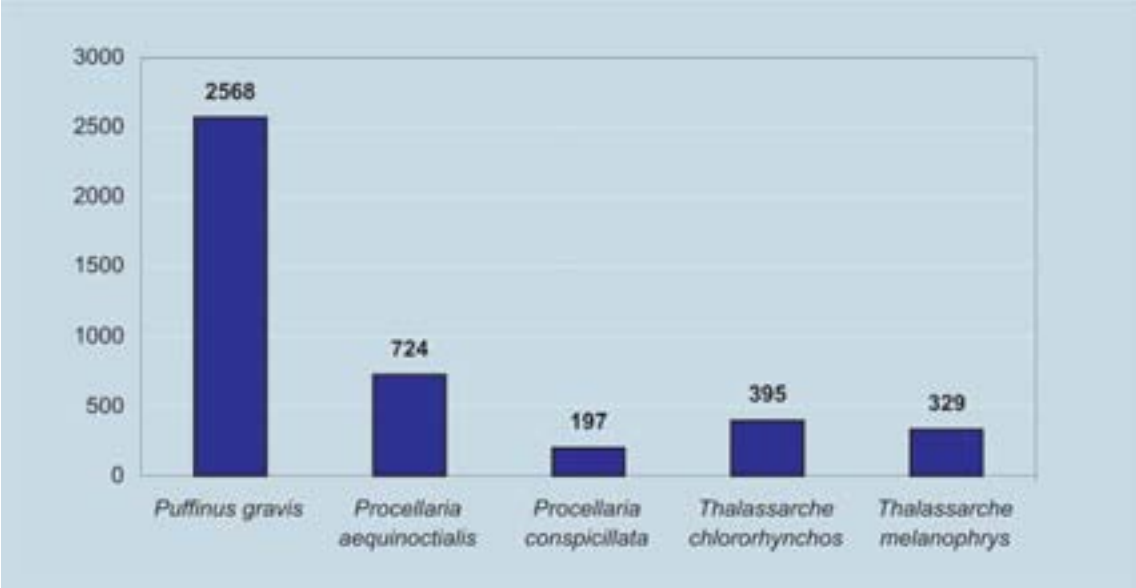


Fig. 45 - Annual mortality estimate of seabirds by bottom longline vessels in Brazil, in 1998/1999

Pelagic longline

The firsts estimates of seabird mortality by pelagic longliners in Brazil (Fig. 46) were conducted by Vaske (1991) and Neves & Olmos (1998), based upon information from 120 cruises done by 15 vessels based in Santos, and by Neves (2000), on 6 cruises done in the RV Atlântico Sul, from FURG.

The Santos fleet captured 139 birds (0.095 birds/1,000 hooks), and this result is probably underestimated, because it is based on information obtained from the fishermen and also on the birds collected by them, without on board observers. The great majority (95.7%) was captured during the winter, in waters from the south of 24°S. Among the captured and identified birds, there are *T. melanophris* (34 individuals), *P. aequinoctialis* (18), *T. chlororhynchos* (17), *P. conspicillata* (6), *Procellaria* sp. (6), *Diomedea exulans* (2) and *D. dabbenena* and *P. gravis* (one individual of each) (Neves & Olmos, 1998).

The RV Atlântico Sul captured more birds: the rate capture of six cruises was 0.73 bird/1,000 hooks, probably due to the equipment, which was lighter and with higher floatability. The captured species were *T. melanophris* (4 individuals) and *P. gravis* and *P. conspicillata* (2 individuals of each).

Such results differ from Vaske (1991), who registered 71 captured birds in 52 fishing days, most of them *P. aequinoctialis* (58 individuals), with a much smaller number of *P. conspicillata* (6), *D. exulans* (4), *T. melanophris* (2) and *Fulmarus glacialoides* (one individual). Considering all settings done, the capture rate was 1.35 bird/1,000 hooks (T. Vaske, pers. comm.). These five cruises were conducted during the winter and in the beginning of the spring, what must have contributed to the high rates of capture.

Using the results obtained for the Santos fleet (Neves & Olmos, 1998), and also from the RV Atlântico Sul (Neves, 2000) and Vaske (1991), Olmos et al. (2001) estimated that the longlining fleet operating at the south and southeast of Brazil captured, annually, on average of 3,084 (2,165 to 4,004) *P. aequinoctialis*, 1,623 (1,139 to 2,107) *T. melanophris*, 690 (484 to 896) *T. chlororhynchos*, 568 (399 to 738) *P. conspicillata*, 243 (171 to 316) *D. exulans*, 122 (86 to 158) *P. gravis*, 41 (29 to 53) *F. glacialoides* and 41 (29 to 53) *D. dabbenena* (Fig. 47). Projected data indicates the capture of 243 (171 to 316) *Procellaria* spp., which could be *P. aequinoctialis* and *P. conspicillata*, according to the same authors.

Fábio Olmos

Fig. 46 - A Black-browed Albatross *Thalassarche melanophris* and three White-chinned Petrels *Procellaria aequinoctialis* killed by pelagic longline

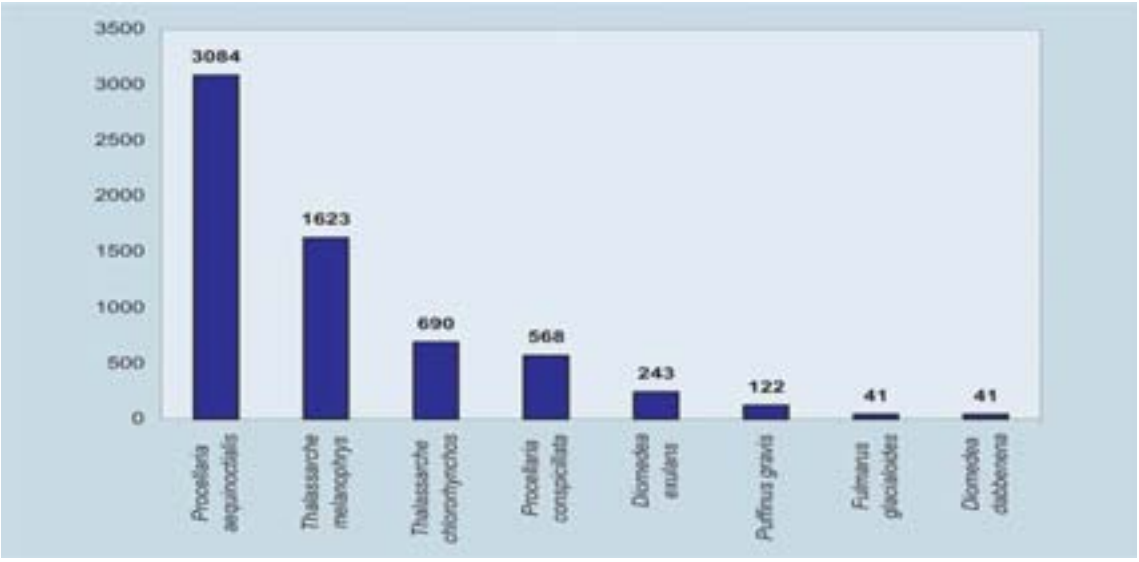


Fig. 47 - Annual mortality estimate of seabirds by pelagic longline vessels in Brazil, in 1998/1999

Later, Soto & Riva (2000), studying longliners based at Itajaí, reported capture rates for albatrosses *Thalassarche* spp. of 2.18 birds/1,000 hooks and for petrels *Procellaria* spp. of 3.33 birds/1,000 hooks, during 3 cruises conducted off the Brazilian south coast.

Recent information obtained from 32 fishing cruises (351 settings with 371,368 hooks) monitored by on board observers of the Projeto Albatroz, between 2000 and 2005 and performing fisheries at the intervals of 20º-40ºS and 26º-52ºW, showed that the CPUE was of 0.09 bird/1,000 hooks (Neves et al., 2005). Calculating the capture rate for each year, we have the following scenario: in 2002, 0.2 bird/1,000 hooks and 105,300 sampled hooks; in 2003, 1.8 birds/1,000 hooks and 56,700 sampled hooks and in 2004, 0.03 bird/1,000 hooks and 90,858 sampled hooks (CCAMLR, 2005).

Mitigation measures

This item describes several measures developed in conjunction with seabirds and fisheries experts, with the objective to avoid the incidental capture of birds during the fisheries activities. Such measures are also presented in an educational publication produced, in partnership, by the Spanish Ornithology Society (SEO, a BirdLife partner in Spain) and Projeto Albatroz (Carboneras & Neves, 2002).

A mitigation measure is here defined as a modification of the gear and/or the fishing procedures, developed to reducing the probability of incidental captures of seabirds. The comprehension of the factors that affect the seabird capture is fundamental for the choice of the mitigation measures.

Most seabirds are captured during the longline settings (Fig. 48) and can be drow during this process. Some are also captured during the hauling of the equipment, but this is less frequent.

Fabiano Peppes

Fig. 48 - Longline setting

The measures described here were, in its majority, widely tested, and has been proven to be efficient at the sea. The combined use of these measures (for example, the night setting and the use of toriline), combined with the limitation of the discards, reduces significantly the capture of albatrosses and other seabirds.

In some regions of the world, for example, the subantarctic waters of CCAMLR's area, the use of several mitigation measures is mandatory. In the same way some fleet, like the Spanish one, which operates surface longlining when fishing south of 30°S, must incorporate several mitigation measures, among the ones mentioned here. Some measures can be used for all types of longlines, others are more efficient for bottom or pelagic longlines.

Revisions about mitigation measures are presented in Cooper (1999) and Cooper et al. (2000).

Toriline

Developed from a Japanese design, the bird scare line (Fig. 49) is also known as toriline (tori = bird in Japanese). It is a very efficient mechanism to avoid the capture of seabirds, because they are annoyed by the presence of strange objects hanging over the area of the longline setting, and then it keeps them away, even if the food is visible. However, it must be used correctly in order to be efficient.

André Dias

Fig. 49 - Toriline in operation

The most efficient design consists of one cable set with a certain tension stretched up high on the stern of the vessel (from where the baited hook are set). Strings and colorful flaps are hanged on the cable and they swing. For a better effectiveness, a pair of cables must be used on the vessel's stern.

The toriline is a long cable, between 60 to 150 m long (depending of the deck's height in relation to the water line), which has one of the extremes tied to a fixed mast at the stern, while the other is set free over the water, with a small buoy at the end to increase the water resistance. From this cable, there are strips or colorful flaps swinging with the wind and driving away the birds.

The construction of the toriline (Fig. 50) has a very low cost, because it may be build with the available material from the own vessel or material that is very easy and cheap to acquire. The correct use of double torilines avoids, alone, 80% of the birds' attacks. The utilization of one toriline is mandatory in the CCAMLR zone, and the

Tatiana Neves

Fig. 50 - Toriline confection

use of two is recommended. A period of adaptation may be necessary until the double toriline is used without causing complications.

These are some suggested materials for the construction of torilines:

Pole: the main pole should be a stainless steel pipe of two inches width, 4.50 m long for vessels whose decks are situated up to 3 m above the water line. It must have an inclination of 25°, being 0,5 m in one side of the angle (inferior part of the pole) and 3,7 m from the other (superior part of the pole), what is necessary to turn the pole and allows to set the toriline cables closer or farther from the longline, if necessary. At its upper end, the main pole must have a welded ring where the toriline cables will be passed through.

To the attachment of the pole, a base must be installed (2.5 inch stainless steel cable), which will be welded at the internal part of the vessel's deck. This base must have holes to introduce a screw that will attach the main pole. The screw must be tied by a cable, to avoid its loss.

Cable or main line: nylon 2 mm thick rope or another floating material, 60 to 150 m long. To this cable colorful strings and flaps must be tied. One end of the cable is tied to the top of the pole while the vessel drags the other extremity. Optionally, a small buoy or other element that offers resistance may be tied to the end that is being dragged to create more tension to the aerial part of the main cable. The union with the secondary cable is made by tying a knot at the main cable, which must have a grip to attach the knot; behind this grip it is placed a rotating snap, that is linked to the secondary cable, which is used to haul the toriline.

Secondary Cable: the same material of the main cable, but with a smaller length, it is used to haul the toriline after use. One end is tied to the main cable; about 2-3 m from the edge of the pole and the other is tied to the deck in a convenient place, like a fixed point for mooring. The length will vary according to the closest tying point.

Strips: colorful polypropylene (for example, blue, red, green, yellow and orange), 3 cm in width, united in bunches of four strips to the main cable, every 2 m, and along all its extension. The strip parts must be 4 m long and be fixed to the main cable, and each portion must be 2 m. In each bunch, do not use repetitive colors. In some countries, instead of strips, they use tubing's of synthetic covering material that gives them certain stiffness. These cables are placed in a decreasing order of size, in regular intervals on all the cable's extension.

A toriline with a good adjustment to the vessel shouldn't present any risk getting entangled to the longline, however, an additional security device can be placed, called a "weak link", in case it occurs. It consists of a 50 cm piece of a nylon line, which is thicker than the main longline line (2 mm). In case of entanglement, the weak link will break before the longline, setting free the fishing equipment. To avoid the equipment loss, the weak link must be set between the pole and the secondary cable.

Night settings

The albatrosses and most seabirds feed preferentially at day light; only few petrels, like the White-chinned Petrel *P. aequinoctialis*, are able to search for food in the darkness. The seabird capture rates during the longline night settings are reduced between 60 and 96% when compared with daylight settings. At Hawaii, Boggs (2003) indicates a reduction of 98% (from 0.06 to 0.001 bird/1,000 hooks) with the use of this technique, on Swordfish fishery.

This measure (Fig. 51) is specially efficient when used together with the total reduction of the lights from the deck and when the fishery occurs under cloudy skies and/or during the new moon.

During setting, the vessel must keep only the necessary lights of security and navigation.

Working at night is specially uncomfortable for the crew, particularly when the sea is turbulent. However, it is known that when fisheries occurs strictly at night (for example, the Swordfish fishing with light sticks or at regions when the night setting is mandatory), the captures are very low. The capture of species that are active at night, like *P. aequinoctialis* can also be reduced if the setting is avoided during the first hours after dusk or just before dawn.

The seabird capture increases during the clear nights with moon, when several seabirds can be active and follow the vessel: three to six

Fabiano Peppes

Fig. 51 - Longline night setting

times more birds are captured at moonlight nights, in comparison to nights without the moonlight. This reinforces the recommendation for combining the night setting with other mitigation measures.

Blue Dyed Baits

This measure was developed in Hawaii, where the fishermen started to dye the baits in order to improve the capture of fishes. The use of such technique resulted in a reduction of 94-95% on the capture of birds comparing to the use of non-dyed baits (McNamara et al., 1999; Boggs, 2001). Boggs (2003) was able to entirely eliminate the capture, at the Swordfish fishery in Hawaii, using a combination of night settings and blue baits. This technique has also been used by Japanese vessels (Minami & Kiyota, 2002). There are evidences that the blue baits are less attractive for sea turtles and do not affect the capture of fishes like the Swordfish and Tunas (NMFS, 2001).

The use of the blue baits have been later adapted for Brazil, where many of the longline vessels' crewmembers have been adopting it for the last three years. The original idea came from the Swordfish's fishermen, who dyed the baits with a bright blue to increase the fishes' capture. Brazilian researches changed the external coloration for a darker blue, making the bait camouflage with the color of the sea and becoming invisible for the birds. This intense coloration is not permanent and when diluted, the bait maintains a deeper layer of bright blue, keeping intact its attractiveness for the fishes.

Concerning the birds, the dyeing is an efficient measure, specially if combined with other measures, like the night setting and the toriline. In some regions of the world, the color of the sea water is not entirely blue, but greenish, and in these cases, it would be more convenient to try other tonalities, mixing the green to blue.

The blue dyed baits (Fig. 52) have been regularly used by fishermen from the south of Brazil, since it has already demonstrated to be efficient also as an attractive element for the fishes. The dye used is one used to dye food, so it doesn't interfere with the fish quality, and is also harmless to the fishermen who handle it. It is a low cost measure, since the quantity of the used dye is very small.

To the dyeing process, it is necessary, first, to thaw the squids, taking them from the freezer a few hours before the longline setting. Fifty grams of the dye must be diluted in 50 liters of water, which may be seawater. The ideal process uses two tons of blue, on equal

Fábio Olmos

Fig. 52 - Squids' dyeing

proportions, commercially know as "bright-blue" or "blue n° 1" and "indigo-blue" or "blue n° 3". The last one, darker, is used to camouflage the bait at the surface and avoid the attack of birds to baited hooks. After a few minutes in contact with seawater, the color dilutes and only the shining blue shows, which seems to be more attractive to the fishes. The baits must stay submersed into this solution, by at least 15 minutes. The dye also makes the baits more resistant what makes them stay longer on the hooks, thus they can be used more than one time.

Side setting

This kind of setting (Fig. 53) was recently tested in Hawaii (Gilman et al., 2003). The setting of the main line of the longline is made from the side of the vessel; at the same time the baited hooks are thrown from the prow, as close as possible to the vessel hull, and the secondary lines are attached to the main line only when the thrown hooks pass thru the point where the main line is being set. A "Bird Curtain" (several lines that touch the water, coming from a pole that protrudes perpendicularly to the side of the vessel) may be used to discourage the seabirds even more.

Some vessels adapted for the longline use already practice the side setting due to the limitations of their design for the conventional setting from the stern.

The objective of this kind of setting is that the hooks are thrown in an area adjacent to the hull in movement, to which the birds do not approach and the turbulence also hides the baits. By attaching the secondary lines to the main one only after the hooks are set, there is no tension on the secondary lines that delay the baits' sinking.

In Hawaii, this was the most efficient mitigation comparing to the use of the blue baits and underwater setting devices at Swordfish fishery during daylight settings. Another advantage is the small change in the working routine for the crew (Gilman et al., 2003).

Underwater setting devices

In some regions like Australia, New Zealand and Hawaii, underwater setting mechanisms were developed, which consists in a tube, with until 9 m long, attached to the bow of the vessel and that can set the line with a dept of until 6 m. Some factories, such as the American

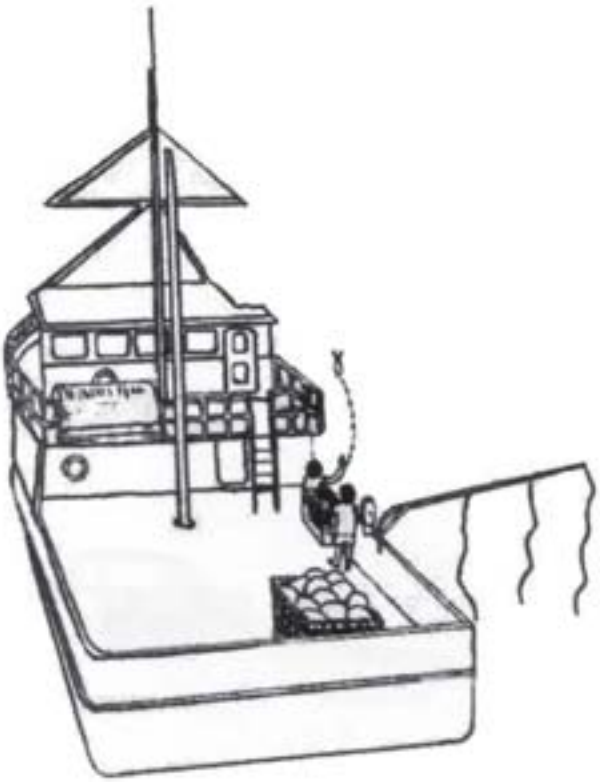


Fig. 53 - Longline side setting (Adapted from Gilman *et al.* 2003)

company Mustad, commercialize this kind of product. In other cases, the fishermen themselves make it.

These mechanisms are very efficient with the surface longline, specially with a very calm sea. For the bottom longline, however, its efficiency is more limited, specially with the system of double line, because when it makes a knot or a cut on the line, the operation must be interrupted during several minutes, and so the hooks stay at the range of the seabirds. Several conditions of the sea may also create a tension on the main line, so it is possible that the longline may emerge to the surface.

Nowadays, tests are being developed in some countries to confirm its efficiency and improve these mechanisms (per example, new mechanisms which allow the longline to go to a desired depth). In theory, this is the mitigation measure that may promote good results, as indicated by Gilman et al. (2003) for Hawaii, despite the design problems of the device used by him.

Thawed baits

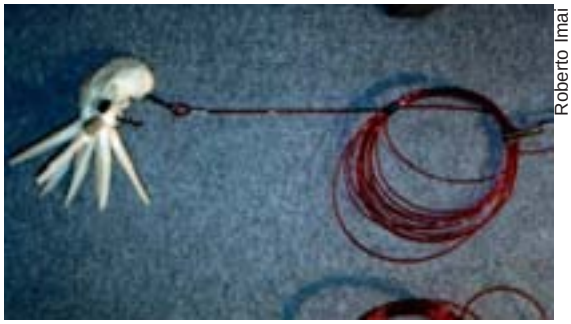
The frozen bait is less dense than the water and, therefore, it floats. When it is thawed out, its density increases and the hook sinks quickly. Recent studies with the Argentinean Squid (the most used frozen bait) demonstrate that the minor rates of bird's capture were obtained when the baits were only partially thawed, as this is the condition for a quicker sink.

The thawing of the baits, even partially, requires space, which may implicate in a few problems for small vessels. However, there is a huge difference in the floatability and this may prevent the birds from reaching the hooks, what is extremely profitable not only for the fisheries but also for seabirds' conservation.

Artificial baits

The use of artificial baits (Fig. 54), made from plastic or rubber, for example, is considered a mitigation measure, but it is less efficient when compared to other methodologies. The idea is that, when seabirds catch the baits, they realize that they are not eatable and then discard them without eating. Experiments carried out in New Zealand demonstrated that its use does not reduce the fishes' capture and they can be attractive for some target-species.

This measure has the inconvenience of using material that can be very expensive and, conversely, few seabirds can be hooked when preying. Besides, there are not specific artificial baits for all the fisheries types.



Roberto Imai

Fig. 54 - Artificial bait

In some countries, determined longline surface fisheries use live baits. Therefore, a living fish is tied to the hook by the head and when is thrown in the water, it starts to swim. As they do not sink quickly, this technique may attract the attention of the birds, which will try to catch them on the surface or during submersion.

Discard limitations

Considering that one of the goals is not to attract the birds close to the longline, the fishes' discards must be avoided, specially during the longline setting. The best practice is to storage the rests for a later discard. When it does happen, grinding is highly recommended, and if possible, discard it into the water through a tube. The less visible the discards are, the bird agglomeration will be less likely. Throwing the discards from the edge must also be avoided while the hooks are still under the surface. When there is no other solution, the rests may be discarded while the longline is being hauled, but this must be done from the part of the boat in the opposite side of the hooks. As a last solution, discards can be used to distract the birds during the longline setting.

Increase of the longline weight

Even if some species may dive up to 20 m or more, the majority of the seabirds are not able to submerge more than a few meters. Because of that, it is important that both the main and secondary lines sink quickly, in order to keep the hooks out of the range of the birds as soon as possible. An efficient measure is to increase the weight of the equipment: at CCAMLR zone, for the Spanish system of bottom longline, it is mandatory the use of a ballast of 8.5 kg, in every 40 m of the cable, or a ballast of 6 kg, in every 20 m.

The ideal situation is that the hooks sink quickly in a minimum velocity of 0.3 m/s, which seems to be a safe velocity for the birds. For this purpose, weight can be added to the main or to the secondary lines. In Hawaii, weights of 60 g are used 1 m from the hooks for Tuna and Swordfish fisheries (Gilman et al., 2003). Also, steel secondary lines covered by a plastic cap may be used. Another possibility is using braided steel instead of nylon monophilament for the main line: even with a similar weight, the steel "cuts" the water with more effectiveness.

Adding ballast to the main line may implicate in additional problems, specially when they use automatic equipment for the longline hauling. Thus, a period for the crew adaptation is necessary so they won't entangle. However, a higher sinking velocity also means more fishing time, because a longline without weights, takes more time to reach great depth.

Fisheries limitation

The limitation of the fisheries permits is the most drastic measure for avoiding seabirds' capture. The relation is evident: if there are no hooks in the water, there are no incidental captures. However, this measure would interfere in an important economic activity, affecting also the workers and theirs dependents - that fish for living - so, such extreme measure must be applied only in cases and when all the other measures do not bring any desired effect.

In the scope of CCAMLR (for example, at the 48.3 zone, close to South Georgia) the longline fisheries is forbidden during the time when the albatrosses are at the breeding colonies. During other months the fisheries are permitted, but under several conditions imposed by this Commission.

In Alaska, the law establishes that the fishery season must be suspended at any time when two or more individuals of Short-tailed Albatross *Phoebastria albatrus* - a threatened species with a small world population - are captured.

The mitigation measures described in this NPOA-Seabirds Brazil aim to avoid the introduction of fishery limitations. The correct application of such measures, as well as the continuous encouragement for the development of new methods to avoid birds' death by the fisheries, must lead to an ideal situation: to allow the continuity of the fisheries activities and the existence of seabird populations (Fig. 55).

Fábio Olmos

Fig. 55 - Black-browed Albatross *Thalassarche melanophris* captured by a longline

The Use of the Mitigation Measures in Brazil

The majority of the pelagic longline fleet, based at the south and southeast regions, is composed by domestic vessels and Brazilian crew, which is a feature that facilitates the management of the incidental capture of seabirds by means of educational work focusing Brazilian fishermen. This kind of work has proven to be efficient, but must advance.

The Projeto Albatroz, in partnership with IBAMA, tested, in 2000 and 2001, mitigation measures on board of some Brazilian vessels, with the purpose of evaluating their efficiency in reducing the seabird incidental capture and also the relation of these measures to the fisheries production and the acceptability by the crew members (skipper and other fishermen). For these tests, three of the main industries based at the ports of south and southeast Brazil were chosen, being two in Santos and one in Itajaí, which were important partners in the development of these tests. Together, these industries had, in 2001, 52% of the fisheries effort of these regions, in number of vessels.

The measures chosen by the ship-owners, among all of the suggested measures at the IPOA-Seabirds, where those that were suitable to the national vessels and their crew, considering its applicability. They used the toriline and the blue dyed baits.

The results showed that when the information is transmitted in a proper way - regarding the importance of the seabird conservation and the economic impact from the interactions between birds and fisheries - it is the most important tool for the voluntary adoption of the suggested measures, compared to the introduction of on board observers and to furnish the equipments and measures for its use. For three years, at least 4 vessels used toriline and blue baits in its fishing routines; progressively, the skippers can adopt, on a voluntary basis, mitigation measures, but a closer monitoring of this activity is extremely necessary.

The tests with the mitigation measures are still going on (including the incidental capture of sea turtles), by means of a partnership between IBAMA (CGFAU, CEMAVE, CEPSUL and TAMAR) and the Projeto Albatroz, using the RV Soloncy Moura. The preliminary results are presented in Tables 1 and 2. Cruises were conducted between 17-25 March and 2-11 July 2003, when they set a pelagic longlines with 300 hooks in areas with depths alternating between 200 to 1,300 m, between the latitudes 24°30' and 28°30'S and longitudes 41° and 48°W. Despite the fact that the number of hooks for each treatment was small, the Tables show the results obtained for the fisheries production and the incidental capture.

Considering that this sample number is very small and the capture was pretty low during the fisheries, the variation on the sample number may be interfering with the CPUE's calculation. However, the fact that the only four Black-browed Albatrosses captured were in hooks with no mitigation measures (with natural bait and without toriline) may be a indicator of the mitigation measures' efficacy.

Soto & Riva (2000) indicates that five cruises that launched 64,150 hooks in 64 sets, captured 15 *Thalassarche* spp. and two Spectacled Petrel *P. conspicillata*, which corresponds to a capture rate of 0.28 birds/ 1,000 hooks, which is very high, considering the simultaneous use of dyed baits and the night setting. This apparent failure concerning the use of the mitigation measures must be better investigated, once it was not very clear which were the dying process used and neither how night setting occurred, considering that those can be compromised by the clear nights or by the excessive illumination at the vessel.

Table 1 - Test results of the mitigation measures used on the RV Soloncy Moura, in 2003, expressed in Capture Rate per Effort Unit (CPUE=number of captured individuals/1,000 hooks) for 4 treatments: blue dyed baits + toriline (n=1,000 hooks); blue dyed baits, without toriline (n=600 hooks); natural baits + toriline (n=2,000 hooks) and natural baits, without toriline (n=1,200 hooks).

Fisheries	Blue Bait		Natural Bait	
	With toriline	Without toriline	With toriline	Without toriline
Swordfish (*Xiphias gladius*)	14.0	3.3	10.0	5.8
Blue Shark (*Prionace glauca*)	9.0	6.7	7.5	7.5
Tuna (*Thunnus* spp.)	0	3.3	2.5	1.7
Other fishes	4.0	3.3	2.5	0
Other sharks	3.0	0	1.0	3.3
CPUE	**30.0**	**16.7**	**23.5**	**18.3**

Table 2 - Test results of the mitigation measures concerning acidental captures, conducted on the RV Soloncy Moura, in 2003, expressed in Capture Rate per Effort Unity (CPUE=number of the captured individuals/1.000 hooks) for 4 treatments: blue dyed baits + toriline (n=1,000 hooks); blue dyed baits, without toriline (n=600 hooks); natural baits + toriline (n=2,000 hooks) and natural baits, without toriline (n=1,200 hooks).

Incidental Capture	Blue Bait		Natural Bait	
	With toriline	Without toriline	With toriline	Without toriline
Black-browed Albatross (*T. melanophris*)	0	0	0	3.3
Loggerhead Turtle (*Caretta caretta*)	0	0	0	0.8
Leatherback Turtle (*Dermochelys coriacea*)	0	1.7	0	0
CPUE	**0**	**1.7**	**0**	**4.2**

Recently, articulations with SEAP, IBAMA and Projeto Albatroz allowed that mitigation mechanisms were included in the official summons for vessel construction and modernization, in the scope of the Profrota, from SEAP. For example, in the SEAP official notification n° 5, from 12/01/2005, one of the items that count points is the inclusion of mechanisms to reduce the seabirds and sea turtles incidental capture by the pelagic longline, counting points the proposals which include the use of dyed baits and/or circle hooks, for all the Brazilian waters' jurisdiction, and toriline or underwater settings devices for the areas at south of 20°S[8].

[8]See *http://200.198.202.145/SEAP/PR/profrota.htm*. Access 12/18/2005.

Parte 2

CONSERVATION PLAN

Goals and actions

Objectives

- To assure the viability of the Procellariiformes's breeding colonies in the Brazilian territory;
- To reduce the seabird incidental capture by the longline fisheries to minimum levels, equal or lower than 0.001 bird/1,000 hooks, making Brazil become a significant agent for the conservation of Albatrosses and Petrels that occur inside and outside its territory.

Specific objectives

Each item received a priority level and a deadline to be reached. The priority scale has four levels:

- ***Essential***: when the accomplishment is necessary to avoid the population decline, which may lead the species' extinction in nature.
- ***High***: it is necessary in order to avoid a decline >20% of the population, in 20 years or less;
- ***Medium***: an objective which accomplishment is necessary to avoid a population decline up to 20%, in 20 years or less;
- ***Low***: when it is necessary to prevent local population decline or which is likely to have only a small impact on the populations, in a larger area.

The deadlines for each specific objective are listed in six categories:

- ***Immediate***: must be reached within the next year;
- ***Short***: between 1 and 3 years;
- ***Medium***: between 1 and 5 years;
- ***Long***: between 1 and 10 years;
- ***Continuous***: which is being developed and must continue;
- ***Completed***: has been reached during the preparation of this NPOA.

The actions associated to these objectives must be revised or redone in the future, according to the circumstances.

The deadlines must be considered after the publication of this NPOA-Seabirds Brazil.

Species that nest in Brazil

Trindade Petrel/Pterodroma arminjoniana

This species nests in one place only (Trindade Island) that is controlled by the Brazilian Navy, what implicates that this institution shall be involved in any initiative. As a preliminary stage for the implementation of the proposed actions, it is recommended that a meeting with representatives from MMA, IBAMA, Brazilian Navy, CIRM and MNRJ is organized for the establishment of a governmental partnership for the seabird conservation on Trindade and Martin Vaz Islands. The formalization of this partnership is essential to achieve the objectives.

MANAGEMENT

Objective 1

To avoid the introduction of rats in Trindade and Martin Vaz.

Action

a) To publish a normative tool establishing as mandatory the previous and confirmed extermination of the rats, for any vessel near the islands (less than one nautical mile) or disembarking at these islands.
Priority: high
Deadline: immediate
Actors: IBAMA and Brazilian Navy

Objective 2

To restore the native habitats at Trindade, reestablishing the forest coverage.

Actions

a) To establish, in Trindade, a seedling nurse, produced from seeds collected in the Island or from plant populations indicated by experts.
Priority: essential
Deadline: medium
Actors: IBAMA, Brazilian Navy, research and educational institutions and NGOs.

b) To map possible reforestation areas and indicate species for each of them.
Priority: essential
Deadline: short
Actors: IBAMA, Brazilian Navy, research and educational institutions and NGOs.

c) To elaborate a plan to the Island's reforestation in the next 10 years.
Priority: essential
Deadline: short
Actors: IBAMA, Brazilian Navy, research and educational institutions and NGOs

Objective 3

To eradicate introduced species that damage the natural habitats in Trindade

Actions

a) To eliminate the goats that might have survived in Trindade.
Priority: essential
Deadline: immediate
Actors: IBAMA and Brazilian Navy.

b) To confirm the extinction of cats in Trindade, eliminating any remaining individual.
Priority: essential
Deadline: immediate
Actors: IBAMA and Brazilian Navy.

c) To publish a legal tool forbidding the introduction, without the formal previous approval of IBAMA, of any animal or plant in Trindade and Martin Vaz.
Priority: essential
Deadline: immediate
Actors: IBAMA, MMA and Brazilian Navy.

Objective 4

To avoid activities that may cause damage to the seabird populations in Trindade and Martin Vaz

Actions

a) To elaborate seabird conservation strategies, to be incorporated at the conducted rules and proceedings for the activities developed at the islands, searching for its compatibility with the recovery of seabird populations.
Priority: high
Deadline: short
Actors: IBAMA, Brazilian Navy, research and educational institutions and NGOs.

b) To create a Protected Area covering the Trindade and Martin Vaz Islands.
Priority: high
Deadline: medium
Actors: IBAMA, MMA and Brazilian Navy.

RESEARCH

Objective 1

To evaluate and monitor the Trindade Petrel *P. arminjoniana* status at Trindade and Martin Vaz.

Actions

a) To perform a population census in Trindade and Martin Vaz.
Priority: medium
Deadline: short
Actors: IBAMA, Brazilian Navy, research and educational institutions and NGOs.

b) To establish a program to monitor the annual survival of banded birds and the breeding parameters of the species in Trindade.
Priority: medium
Deadline: short
Actors: IBAMA, Brazilian Navy, research and educational institutions and NGOs

Objective 2

To define the oceanic distribution of the species.

Actions

a) To implement a satellite tracking program to identify the foraging and dispersion areas.
Priority: essential
Deadline: short
Actors: IBAMA, Brazilian Navy, research and educational institutions and NGOs.

Audubon's Shearwater Puffinus lherminieri

This species occurs in Brazil only in two distinct localities: in Fernando de Noronha Archipelago and in the Itatiaia Islands, at Vila Velha municipality, Espírito Santo State. The Fernando de Noronha colonies are within the area of the Marine National Park of Fernando de Noronha and there are chances that it occurs in the adjacent APA. This way, the recommended actions must be introduced to the Protected Areas Management Plans. The Itatiaia Islands are not a Protected Area.

MANAGEMENT

Objective 1

To assure a larger protection status of the Itatiaia Islands, areas under the administration of SPU.

Action

a) To create a Protected Area covering the Itatiaia Islands and its surrounding areas.
Priority: essential
Deadline: short
Actors: IBAMA, MMA, SPU, City Hall of Vila Velha, research and educational institutions and NGOs

Objective 2

To prevent that the introduced predators have access to the breeding colonies at Fernando de Noronha and Itatiaia Islands.

Actions

a) To control the disembarks at the islands occupied by that species, making sure that it is only done by vessels that have no possibility of carrying rats.
Priority: essential
Deadline: immediate
Actors: IBAMA, Pernambuco State Government, City Hall of Vila Velha, Brazilian Navy, research and educational institutions and NGOs

b) To implement monitoring measures that allow the fast detection of rats in the Itatiaia Islands (Vila Velha), Morro do Leão and Morro da Viuvinha (Fernando de Noronha).
Priority: essential
Deadline: immediate
Actors: IBAMA, research and educational institutions and NGOs

c) To eliminate the rats introduced in Fernando de Noronha and in the satellite-islands and carry out their control, by using permanent stations with baits for rats.
Priority: essential
Deadline: long
Actors: IBAMA, Pernambuco State Government, educational and research institutions and NGOs

d) To eliminate the lizard Tupinambis merianae of Fernando de Noronha. The controlling methods should not harm the endemic lizard Euprepis atlanticus (=*Mabuya maculata*).
Priority: essential
Deadline: long
Actors: IBAMA, Pernambuco State Government, research and educational institutions and NGOs

Objective 3

To eradicate the introduced predators in Fernando de Noronha

Actions

a) To entirely eliminate the dogs and cats in Fernando de Noronha.
Priority: essential
Deadline: long
Actors: IBAMA, Pernambuco State Government, research and educational institutions and NGOs

b) To carry out a campaign for identification and sterilization of dogs and cats belonging to the Fernando de Noronha's inhabitants.
Priority: essential
Deadline: short
Actors: IBAMA, Pernambuco State Government, research and educational institutions and NGOs

c) To forbid disembarks of new dogs and cats from airplanes and vessels in Fernando de Noronha, preferably by legal instrument.
Priority: essential
Deadline: short
Actors: IBAMA, MMA, INFRAERO, Pernambuco State Government and Brazilian Navy.

d) To establish a permanent monitoring program and control of the populations of rats and lizards *Tupinambis merianae*, in the area of Fernando de Noronha Marine National Park and the APA of Fernando de Noronha, with the purpose to avoid new colonization.
Priority: essential
Deadline: long (and must be maintained constantly).
Actors: IBAMA, Pernambuco State Government, research and educational institutions and NGOs

RESEARCH

Objective 1

To search new breeding colonies of the species.

Action

a) To conduct surveys using play-back and burrows inspections in the satellite-islands of Fernando de Noronha and promising areas of the main island (like areas with fallen blocks over Ponta da Sapata).
Priority: medium
Deadline: medium
Actors: IBAMA, research and educational institutions and NGOs

Objective 2

To evaluate if the availability of nesting sites (burrows) is a limiting factor for the species in Itatiaia Islands and Fernando de Noronha.

Action

a) To conduct experiences with artificial burrows and evaluate if their occupation by new breeding pairs, increasing the local populations.
Priority: medium
Deadline: medium
Actors: IBAMA, research and educational institutions and NGOs

Objective 3

To monitor the colonies of the species.

Action

a) To implement a monitoring project of the known nests in the Itatiaia Islands and Fernando de Noronha.
Priority: high
Deadline: long (and must be maintained constantly).

Migratory species that interact with the fisheries

In contrast to what occurs with the nesting species - since they reproduce in different areas and require special conservation and management activities - the migratory species interact in the same way with the fisheries and, therefore, the management activities may be the same for all the species.

The proposed measures are based in four main lines:

- Normalization of the mandatory use of the mitigation measures;
- Establishment of incentive measures for the adoption of such measures;
- Monitoring of its adoption by a consistent on board observers program;
- Development of educational activities directed to fishermen on board.

Additionally, these activities must also consider actions to avoid the capture of sea turtles, or the mortality of the individuals eventually captured.

MANAGEMENT

Objective 1

To provide legal assistance to the mandatory use of the mitigation measures in order to avoid the incidental capture of seabirds by the longline fisheries.

Actions

a) To elaborate and promulgate rules regulating the use of mitigation measures by all longliners. The legislation must determine combined methodologies for vessels that do not use artificial baits. Such measures must be mandatory for all national and leased fleet, considering the specificity of each fisheries modality;

Pelagic Longline (Swordfish and Tuna fish) - blue baits and night setting, combined with one or more of the following measures: toriline, side setting, configurations of the secondary lines that maximize its sinking and limitation of discards.

Bottom Longline - combination of two or more of the following measures: thawed baits, configurations of the secondary lines that maximize its sinking, toriline, blue baits, side setting and limitation of discards.

Surface Longline (for Dolphin Fish) - a diagnosis must be conducted for the establishment of mitigation measures

Observation: Other mitigation measures may be identified or defined.

Priority: essential
Deadline: immediate
Actors: IBAMA, MMA, SEAP, MRE, fisheries industries, research and educational institutions and NGOs.

b) To incorporate to the policy of renovation of the national fleet, tests for the introduction and/or incentive measures for the adoption of the mechanisms of the underwater setting or side setting for longliners, as well as the construction of a device for the discard of fishes' residuals thrown at the opposite side of the longline setting.
Priority: essential
Deadline: immediate
Actors: IBAMA, MMA, SEAP, fisheries industries, research and educational institutions and NGOs.

Objective 2

To find ways to stimulate the adoption of mitigation measures by certifying and possible value aggregation to the fishes captured using mitigation measures.

Action

a) To stimulate the certification for fisheries practiced with the use of the mitigation measures, attributing to them a stamp called `seabird friendly´ or `captured without harming the seabirds´.
Priority: high
Deadline: medium
Actors: IBAMA, SEAP, fisheries industries, research and educational institutions and NGOs.

Objective 3

To implement a national program of on board observers, trained in specific courses and with a legal recognition of its function, as a mechanism of control and evaluation of the use of the mitigation measures and its efficiency, according to the On Board Observers National Program - Probordo, from SEAP.

Actions

a) To make legal the on board observer function, defining the professional profile, its obligations and activities.
Priority: essential
Deadline: immediate
Actors: IBAMA, MMA and SEAP.

b)To define the methodological contents of the capacity building courses for on board observers (On Board Observer Manual), to incorporate specific topics about the identification and data collection about seabirds and sea turtles, as well as the procedures to obtain the fisheries certificate.
Priority: essential
Deadline: immediate
Actors: IBAMA, SEAP, research and educational institutions and NGOs.

c) To promote courses through SEAP and IBAMA, in partnership with the executing institutions, where the observer will be trained for the accomplishment of the work following the concept observer/educator. The observer's credentials will be attributed by the executing institutions, with the approval of the SEAP, seeking a legal recognition of its function.
Priority: essential
Deadline: immediate
Actors: IBAMA, SEAP, research and educational institutions and NGOs.

d) To maintain a unified information system about the observers and the monitored fleet, with the data collected by the observers. SEAP, through the executing institutions and IBAMA (with the support of its specialized centers), must conduct the system management. An unified and integrated information system must be predicted.
Priority: high
Deadline: short
Actors: IBAMA, SEAP, research and educational institutions and NGOs.

e) To include the obligation of the data collection related to the incidental capture of officially threatened species (seabirds, sea turtles, cetaceous and others), including the conservation of the seabird carcasses (and biological data associated to them), which must be destined to research institutions/museums. The IBAMA, via COFAU, must receive the collected data.
Priority: high
Deadline: short (and must be maintained constantly).
Actors: IBAMA, SEAP, research and educational institutions and NGOs.

f) To create an inter-institutional body (committee or council) to deal with the demands concerning the On Board Observers Program on the Brazilian fishing fleet (national and leased vessels). This body must have representatives from IBAMA, MMA, SEAP, fisheries industries, the Working Group for the Conservation of Albatrosses and Petrels, conservation projects, scientific committees for the management of the fisheries resources, legally constituted associations of on board observers, research and educational institutions and NGOs.

The role of such body will be advisor SEAP in the management of the issues related to the On Board Observers Program, with the following attributions:

- To evaluate strategies, priorities and monitoring procedures on board and suggest changes when necessary;
- To support the definition of the operational strategies and the observer's credential, suggesting selection criteria.
- To analyze the data and the collected information and elaborate technical reports about the program.

Priority: medium
Deadline: medium
Actors: IBAMA, MMA and SEAP.

Objective 4

To cover 100% of the longline leased fleet with on board observers, immediately after the publication of the NPOA-Seabirds Brazil, according to what is foreseen by the Probordo, and a percentage of the national fleet coverage to be defined by the Probordo Managing Committee.

Action

a) To elaborate rules defining the criteria and mechanisms for the selection of the national fisheries that must be monitored by on board observers.

Priority: essential
Deadline: short
Actors: IBAMA, MMA and SEAP.

Observation: The forecasted actions in this item depend on the implementation of the On Board Observers Program, as described in Objective 3.

Objective 5

To evaluate the interaction of other fisheries modalities, besides the ones already mentioned, with the seabirds.

Actions

a) To have on board observers in order to obtain information, evaluating the number of birds killed per effort unit, and the specific composition.

b) To compile the information already obtained by observers.
c) Based upon the obtained information, propose management actions.
Priority: high
Deadline: medium (and must be maintained constantly).
Actors: IBAMA, fisheries industries, research and educational institutions and NGOs.

Objective 6

To establish mechanisms for the development of educational activities and the divulgation of the importance of the seabird conservation, specially for the fisheries longline fishermen.

Actions

a) To develop environmental educational programs according to the following action lines:
- Creation of a specific environmental education methodology for all the parties involved in the longline fisheries;
- Stimulate the longline fishermen to use the mitigation measures;
- Development of activities and products to promote the awareness, education and fishermen capacity building, as well as the marine environment conservation.
- Promote the formal education and alphabetization among the fishermen from the fisheries companies based at main Brazilian ports;
- Production and capacity building of professionals who act inside the fisheries, aiming to develop techniques and knowledge that straighten the ethical values for the environmental preservation and citizenship.
- To promote the maritime mentality in the Brazilian collectiveness, increasing the sight of the economical and social environmental potentials, alerting the society for the necessity of a responsible and shared administration of the areas and marine resources.

Priority: high
Deadline: medium (and must be maintained constantly).
Actors: IBAMA, MMA, SEAP, MEC, fisheries industries, research and educational institutions and NGOs

RESEARCH

Objective 1

To improve the knowledge about critical areas concerning the bird captures by longline fisheries, to which the use of the complementary mitigation measures must be required.

Action

a) To develop researches on the oceanic distribution of threatened Albatrosses and Petrels, identifying the preferred feeding areas where seabird concentration occur, the seasonal dynamics involved in the concentration and the overlap with the fishing areas.
Priority: high
Deadline: long
Actors: IBAMA, SEAP, research and educational institutions and NGOs.

Objective 2

To study the biology of the seabirds that are vulnerable to the fisheries.

Action

a) To develop researches about the ecology and feeding behavior of the Albatrosses and Petrels species, identifying characteristics, situations, periods and areas more vulnerable to incidental capture.
Priority: high
Deadline: long
Actors: IBAMA, SEAP, research and educational institutions and NGOs.

Objective 3

To develop more effective mitigation measures or improve the existent ones, evaluating its efficiency.

Actions

a) To develop researches for the development of simple mitigation measures, easily applicable.
   Priority: high
   Deadline: medium
   Actors: IBAMA, SEAP, fisheries industries, research and educational institutions and NGOs.

b) To research weight configurations of the lines that result in fast submerging rates and with minor seabirds capture rate.
   Priority: high
   Deadline: medium
   Actors: IBAMA, SEAP, fisheries industries, research and educational institutions and NGOs.

c) To research underwater setting devices that can be incorporated on new vessels' projects.
   Priority: high
   Deadline: medium
   Actors: IBAMA, SEAP, fisheries industries, research and educational institutions and NGOs.

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Appendix I

List of links to access NPOAs and Procellariiformes conservation policies from abroad

The following countries have longline's fishing fleet that incidentally capture (or are suspected to) Procellariformes: South Africa, Angola, Argentina, Australia, Canada, Chile, Colombia, South Korea, Ecuador, Spain, United States, Finland, France, Iceland, Japan, Madagascar, Mexico, Mozambique, Namibia, Norway, New Zealand, Panama, Peru, United Kingdom, Russia, Sweden, Taiwan, Ukraine, Uruguay, Venezuela and Vietnam.

To the countries listed below, we obtained information regarding the conservation policies of Procellariformes, including the elaboration of NPOAs (countries that have already elaborated NPOAs are marked with asterisk). For the other ones, there is no information available.

ARGENTINA
Did not start the elaboration of the NPOA, what must occur in 2006, coordinated by the NGO Aves Argentinas, (a partner of Birdlife in Argentina) (Esteban Frere[1] *in litt*.)
http://www.fao.org/documents/show_cdr.asp?url_file=/docrep/007/y5742e/y5742e00.htm

AUSTRALIA*
http://www.deh.gov.au/biodiversity/threatened/publications/recovery/albatross
http://www.afma.gov.au/information/publications/fishery/baps/docs/antbap03.pdf
http://www.deh.gov.au/biodiversity/threatened/publications/tap/longline/

CHILE*
NPOA already written and in press (Carlos A. Moreno[2] *in litt*.).
http://www.fao.org/documents/show_cdr.asp?url_file=/docrep/007/y5742e/y5742e00.htm

JAPAN*
ftp://ftp.fao.org/FI/DOCUMENT/IPOAS/national/japan/NPOA-seabirds.pdf

NEW ZEALAND*
http://www.doc.govt.nz/Conservation/001~Plants-and-Animals/004~Seabirds/002~National-Plan-of-Action-to-Reduce-Catch-of-Seabirds-in-NZ-Fisheries/index.asp

PERU
http://www.fao.org/documents/show_cdr.asp?url_file=/docrep/007/y5742e/y5742e00.htm

SOUTH AFRICA *
http://www.environment.gov.za/PolLeg/GenPolicy/2003jan08/SA-NPOA_2.pdf

TAIWAN
NPOA under elaboration

UKRAINE
To date, the Ukrainian longline fleet is composed by a single vessel (`Mellas´), which operates on the FAO's area 41, capturing the Patagonian Toothfish (*Dissostichus eleginoides*). This vessel operates according to the conservation measures indicated by CCAMLR regarding the longline fisheries. Considering this scenario, Ukraine does not foresee the elaboration of a NPOA (Dr. Volodymyr Herasymchuk[3] *in litt*.).

UNITED KINGDOM (Falklands/Malvinas Island and South Georgia)*
http://www.falklandsconservation.com/March_2004_FI_NPOA-Longline.pdf

UNITED STATES*
http://www.fakr.noaa.gov/protectedresources/seabirds/npoa/npoa.pdf
http://ecos.fws.gov/docs/recovery_plans/2005/051027.pdf

URUGUAY
Hasn't elaborated the NPOA yet, what must occur in February 2006, through Dinara (`National Directorate of Aquatic Resources´, Ministry of Agriculture and Fisheries). The NPOA will be elaborated by NGOs (like Aves Uruguay and Averaves) and fisheries sector, among others, and a preliminary version of the document is supposed to be ready in 2006. There are already rules for some fisheries that capture birds, and also their monitoring, used to evaluate new fisheries (Yamandú Marin[4] *in litt*.).
http://www.fao.org/documents/show_cdr.asp?url_file=/docrep/007/y5742e/y5742e00.htm

All the accesses to the above mentioned documents were done in 12/18/2005.

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[1] Coordinator of the Seabird Program of BirdLife to South America.
[2] Professor of the Austral University of Chile.
[3] Head of the International Cooperation Division from the Fisheries State Department of Ukraine.
[4] Fisheries Technology Department, Uruguay.

Appendix II

The IUCN Red List Categories

According to the 3.1 version IUCN (2004).

EXTINCT (EX)

A taxon is Extinct when there is no reasonable doubt that the last individual has died. A taxon is presumed Extinct when exhaustive surveys in known and/or expected habitat, at appropriate times (diurnal, seasonal, annual), throughout its historic range have failed to record an individual. Surveys should be over a time frame appropriate to the taxon's life cycle and life form.

EXTINCT IN THE WILD (EW)

A taxon is Extinct in the Wild when it is known only to survive in cultivation, in captivity or as a naturalized population (or populations) well outside the past range. A taxon is presumed Extinct in the Wild when exhaustive surveys in known and/or expected habitat, at appropriate times (diurnal, seasonal, annual), throughout its historic range have failed to record an individual. Surveys should be over a time frame appropriate to the taxon's life cycle and life form.

CRITICALLY ENDANGERED (CR)

A taxon is Critically Endangered when the best available evidence indicates that it meets any of the criteria A to E for Critically Endangered (see Appendix III), and it is therefore considered to be facing an extremely high risk of extinction in the wild..

ENDANGERED (EN)

A taxon is Endangered when the best available evidence indicates that it meets any of the criteria A to E for Endangered (see Appendix III), and it is therefore considered to be facing a very high risk of extinction in the wild.

VULNERABLE (VU)

A taxon is Vulnerable when the best available evidence indicates that it meets any of the criteria A to E for Vulnerable (see Appendix III), and it is therefore considered to be facing a high risk of extinction in the wild.

Appendix III

The IUCN Red List Categories and Criteria

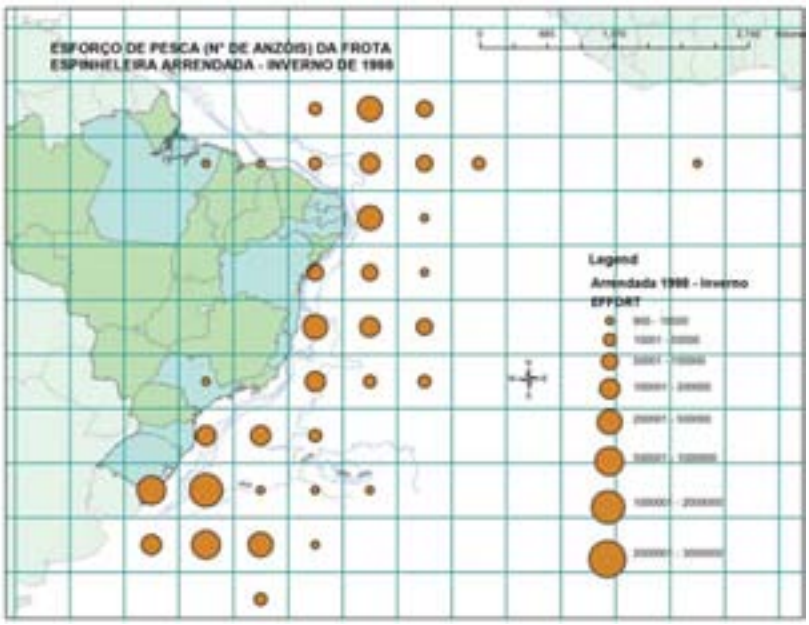
Criteria	Vulnerable	Endangered	Critically Endangered
A. Population in decline			
Population reduction (observed, estimated, inferred or suspected) based on any item below			
1-Reduction already occurred. Reduction causes reversible, understood and ceased. Reduction rate of:	50% over the last ten years or three generations	70% over the last ten years or three generations	90% over the last ten years or three generations
2-Reduction already occurred. . Reduction causes still active or poorly known or irreversible. Reduction rate of:	> 30%	>50%	>80%
3-Projected reduction for the next ten years or three generations. Reduction rate of:	>30%	>50%	>80%
4- Occurred and projected reduction, in ten years or three generations. Reduction rate of:	> 30%	>50%	>80%
a- Direct Observation			
b-Index of abundance appropriate to the taxon			
c-Decline in the area of occupancy, extension of the occurrence and/or habitat quality			
d-Actual or potential levels of exploitation			
e-Effects introduced taxa, hybridization, pathogens, pollutants, competitors or parasites.			

Criteria	Vulnerable	Endangered	Critically Endangered
B. Restricted distribution and decline or fluctuation			
1 - Occurrence extension:	< 20.000 km2	< 5.000 km2	< 100 km2
2 - or occupancy area:	< 2.000 km2	< 500 km2	< 10 km2
And at least two or three of the following characteristics:	Not more than at 10 locations	Not more than 5 locations	One single location
a - Geographic distribution highly fragmented. Taxa registered at:	Any rate	Any rate	Any rate
b - Continuous diminution at:			
(i) Occurrence extension			
(ii) Occupancy area			
(iii) Area, extension and/or habitat quality			
(iv)Numbers of localities or sub populations			
(v)Numbers of mature individuals			
c - Extreme fluctuation on the geographic distribution	Any rate	Any rate	Any rate
C. Reduced population size or in decline			
Estimated populations at:	< 10.000	< 2.500	< 250
One of the following situations:			
1- Estimated continuous population decline:	10% in 10 years or three generations	20% in five years or two generations	25% in three years or one generation
2-Continuous population decline in at least one of the following situations:			
a- Populations structured in the following way:			
(i)No sub population with more than:	1.000	250	50
(ii)Number of individuals in a sub population:	100%	At least 95%	At least 90%
b-Extreme population fluctuation	Any rate	Any rate	Any rate
D. Reduced or restricted population size			
Number of mature individuals:	< 1.000 (1)	< 250	< 50
Or for the Vulnerable category (2):	Occupation area of 20 km2 or five or less than five locations, so the taxon may be affected by antropic activities or stochastic events in a short period of time, becoming critically Endangered or even Extinct.	(No application)	(No application)
E. Quantitative Analyses			
Showing that the probability of the extinction in nature is at least 10%, in ten years.			

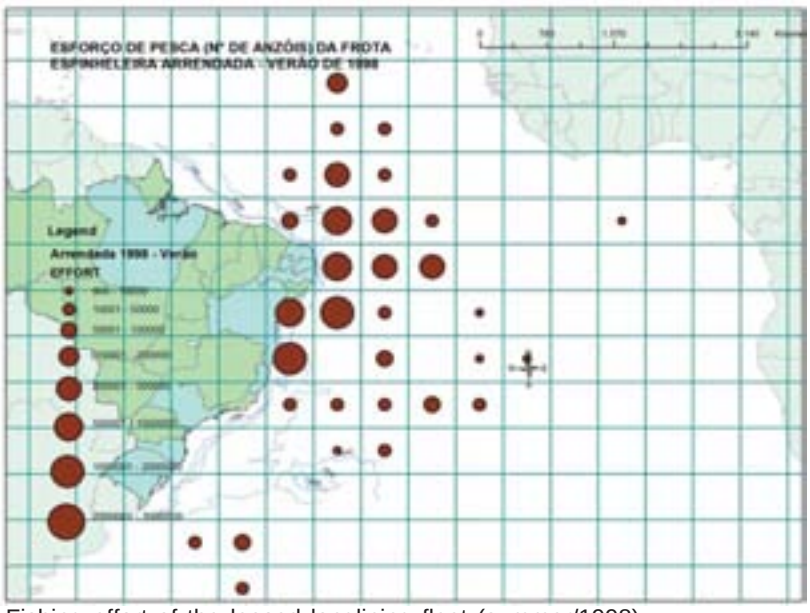
Appendix IV

Maps of the evolution of the fisheries efforts of the national and leased pelagic longline fleet, between 1998 and 2002, considering the summer months (October to April) and winter (May to September).

Maps elaboration: Guilherme Maurutto (TAMAR/IBAMA).
Subsides to the elaboration: official data presented by Brazil to the ICCAT, compiled by Fábio Hazin and Paulo Travassos (UFRPE).



Fishing effort of the leased longlining fleet (winter/1998)



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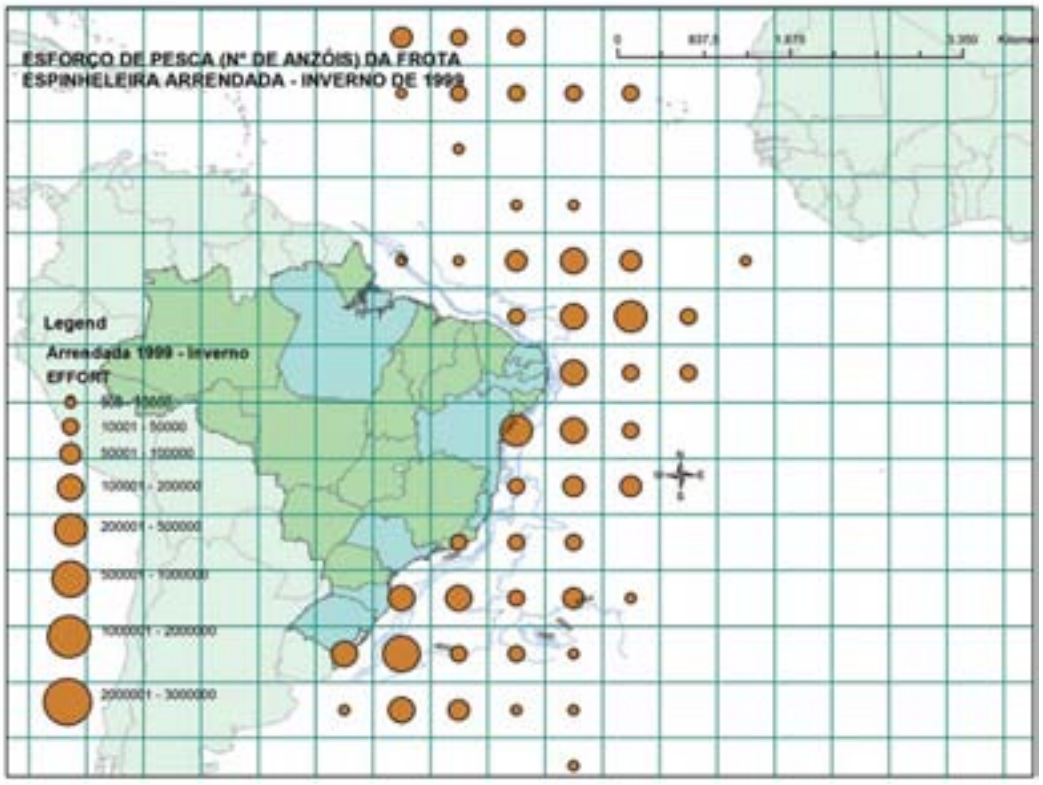

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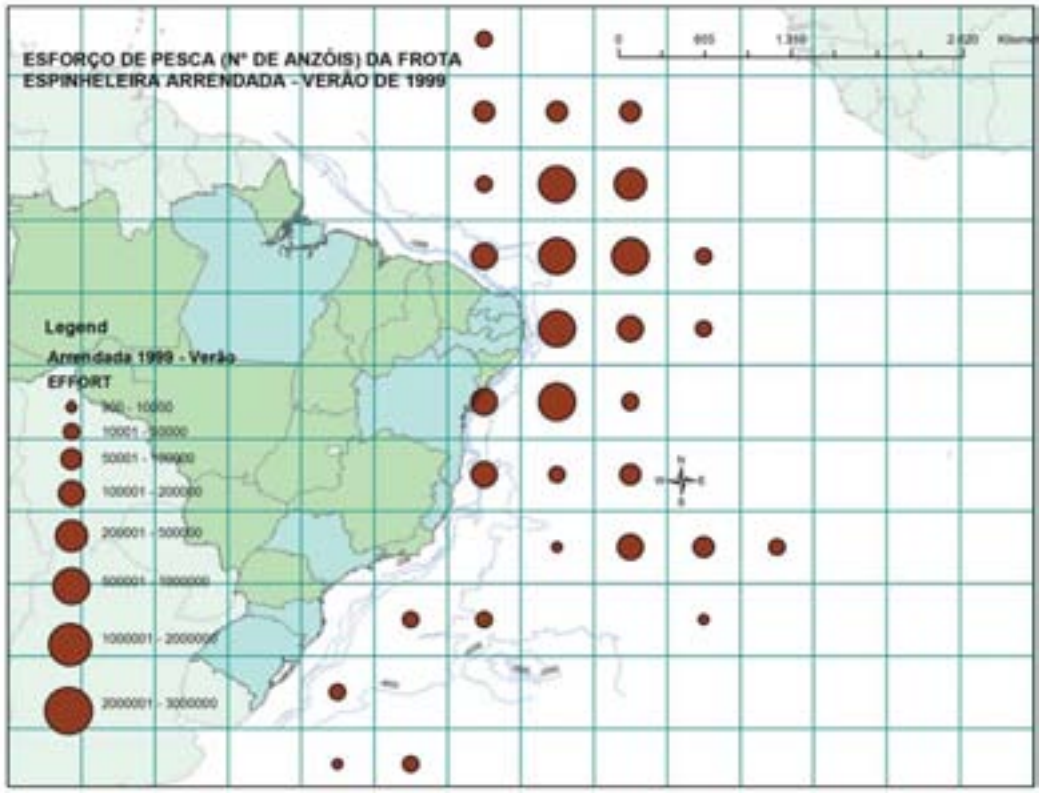
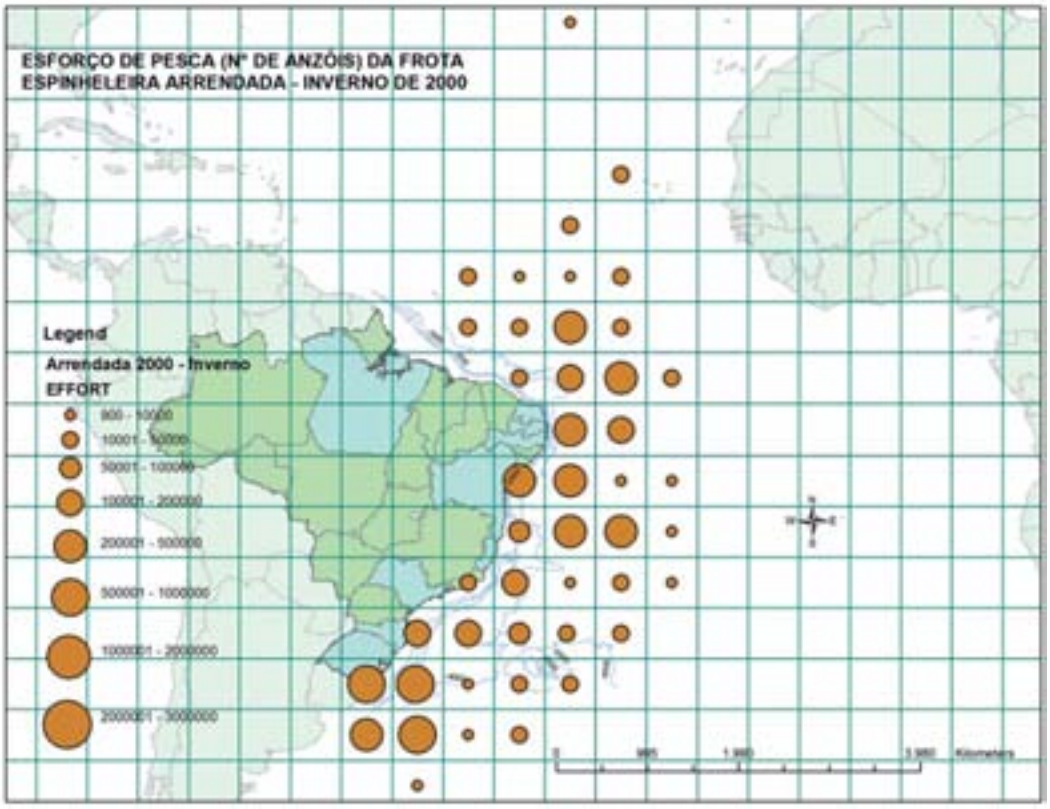
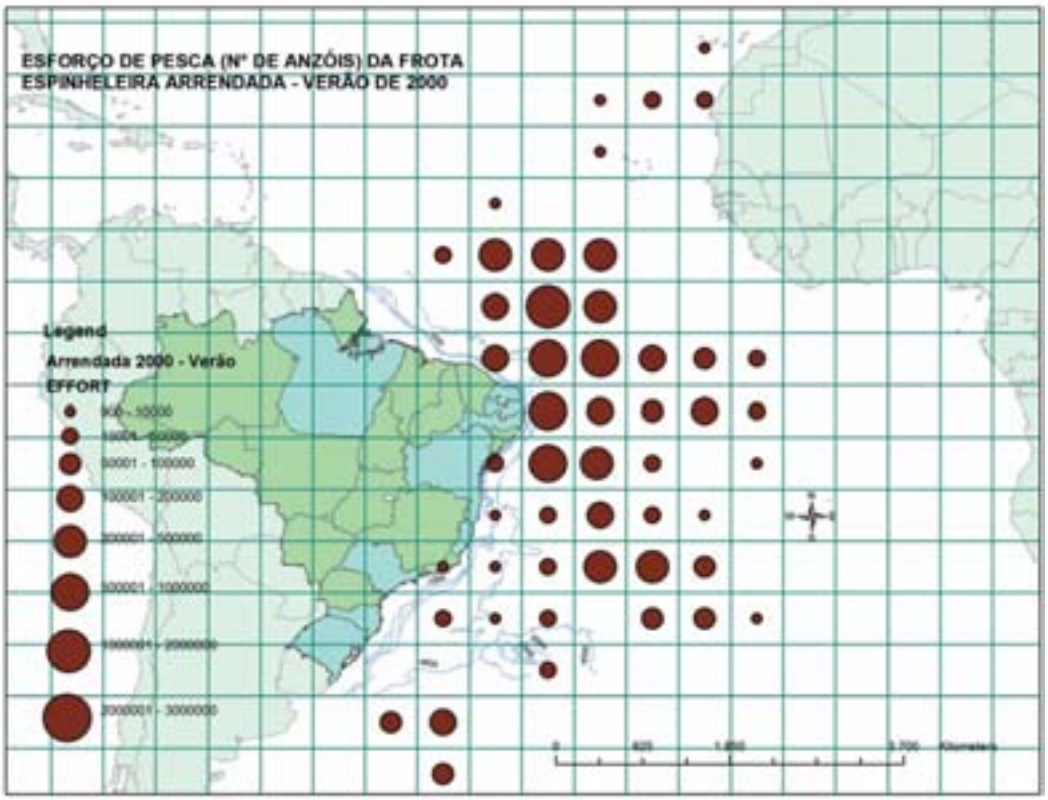


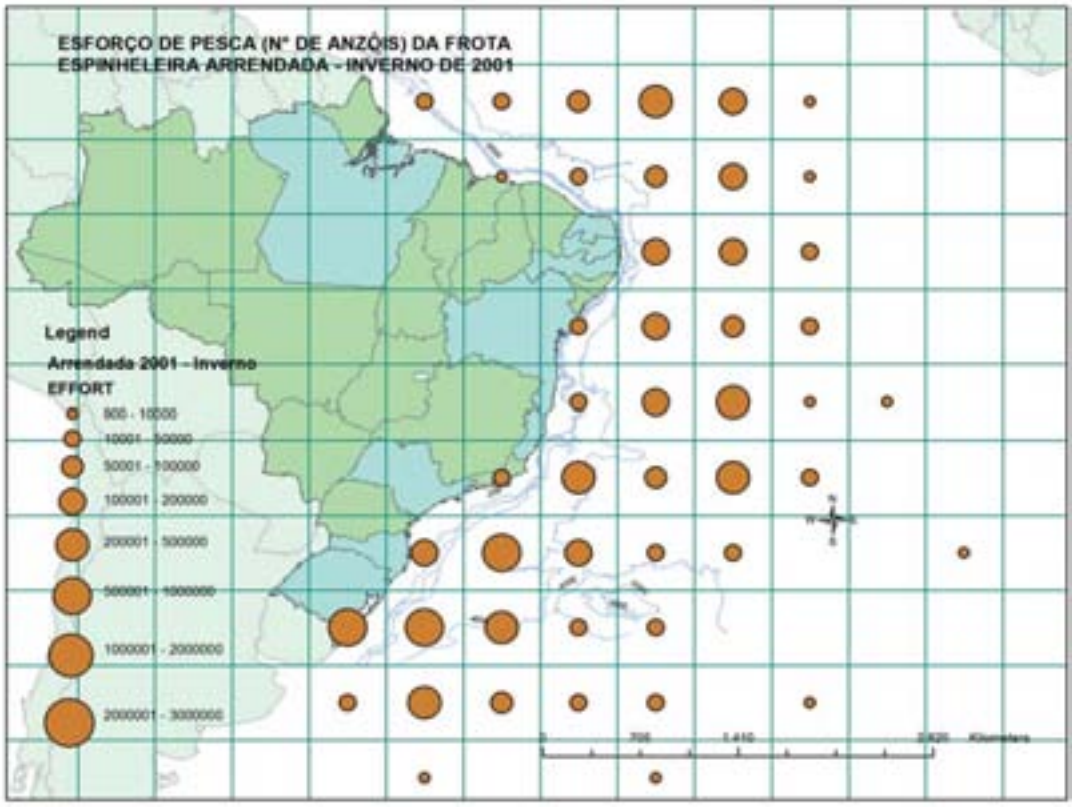
Fishing effort of the leased longlining fleet (summer/1999)



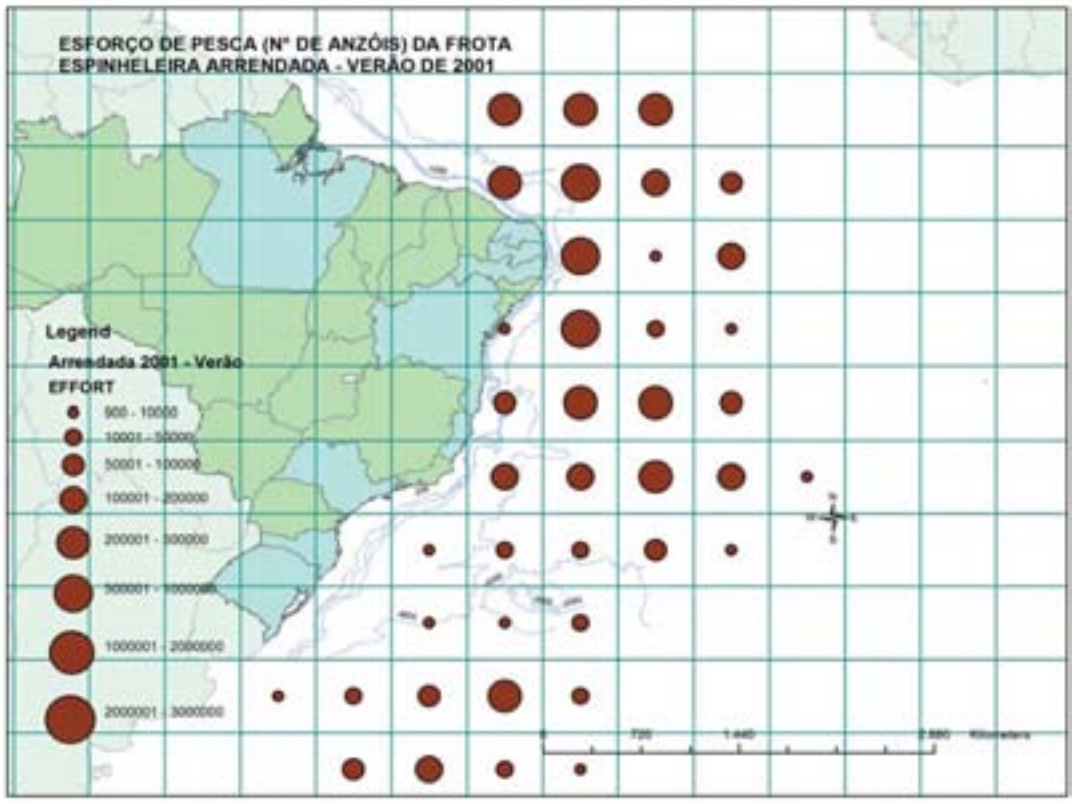
Fishing effort of the leased longlining fleet (winter/2000)



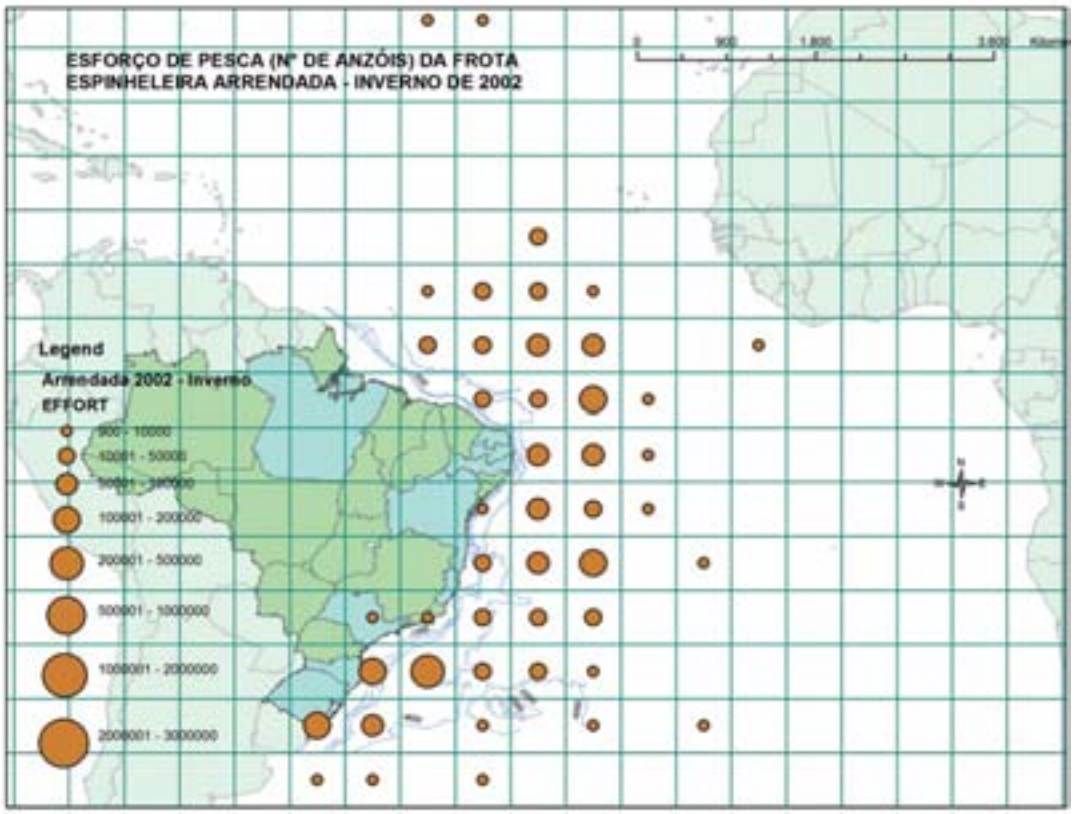
Fishing effort of the leased longlining fleet (summer/2000)



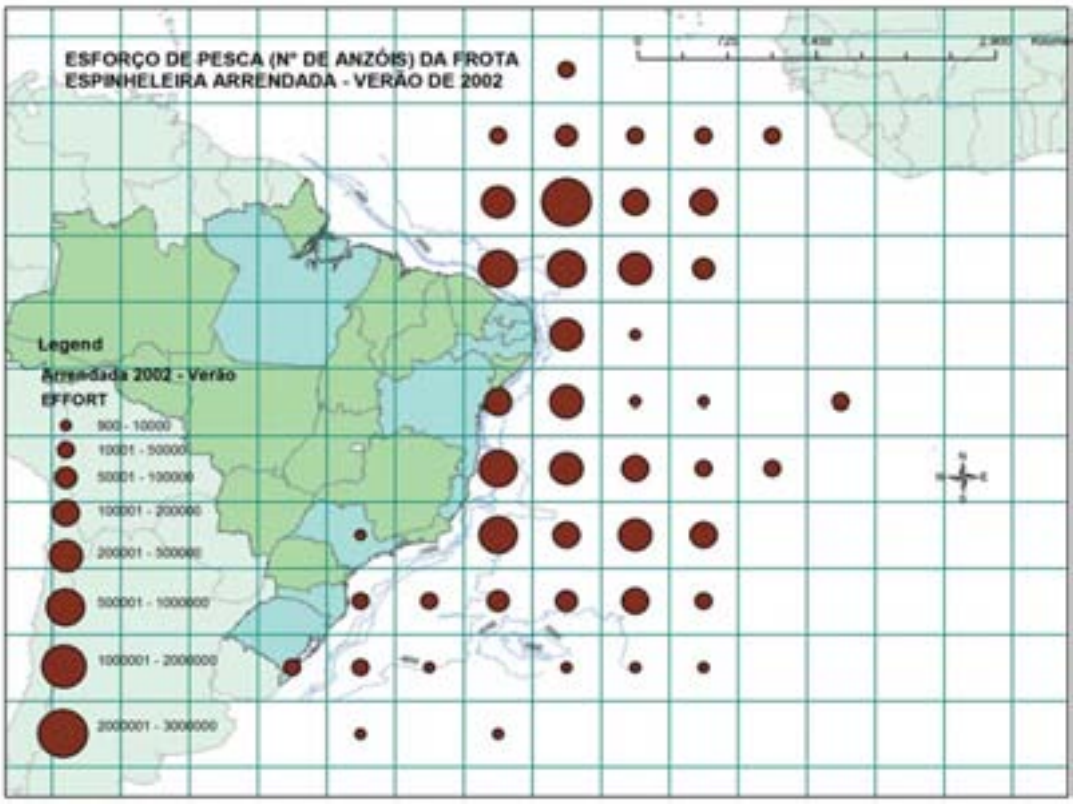
Fishing effort of the leased longlining fleet (winter/2001)



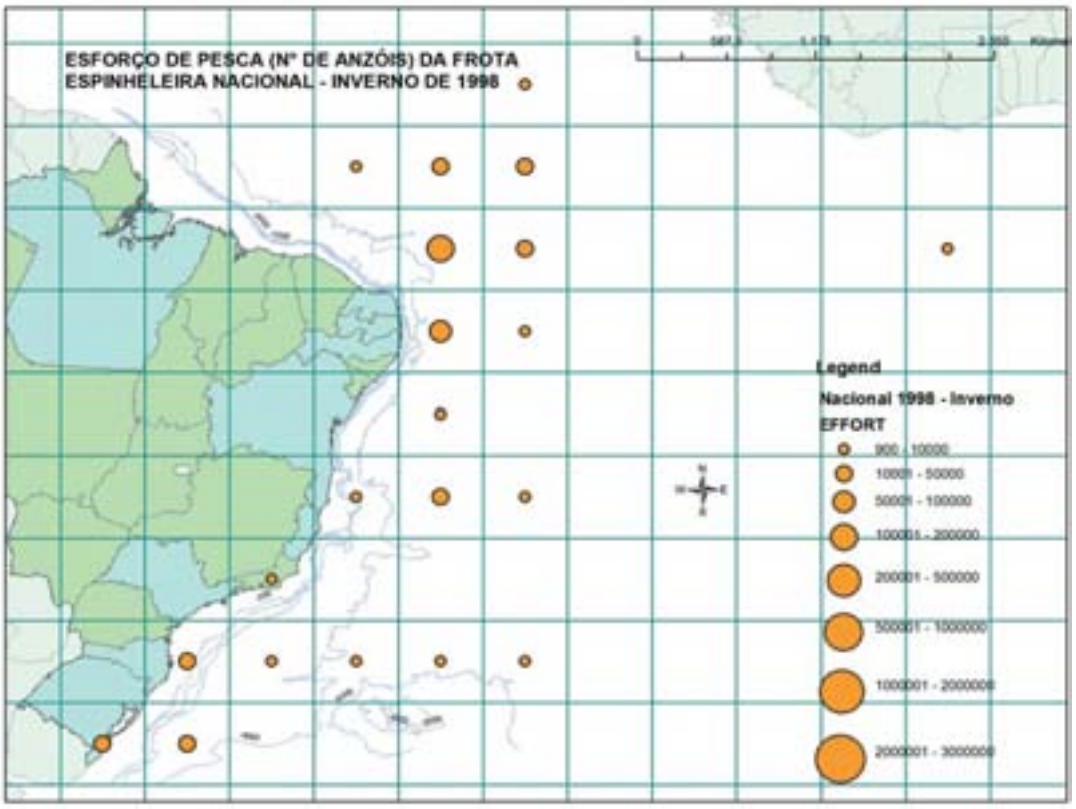
Fishing effort of the leased longlining fleet (summer/2001)



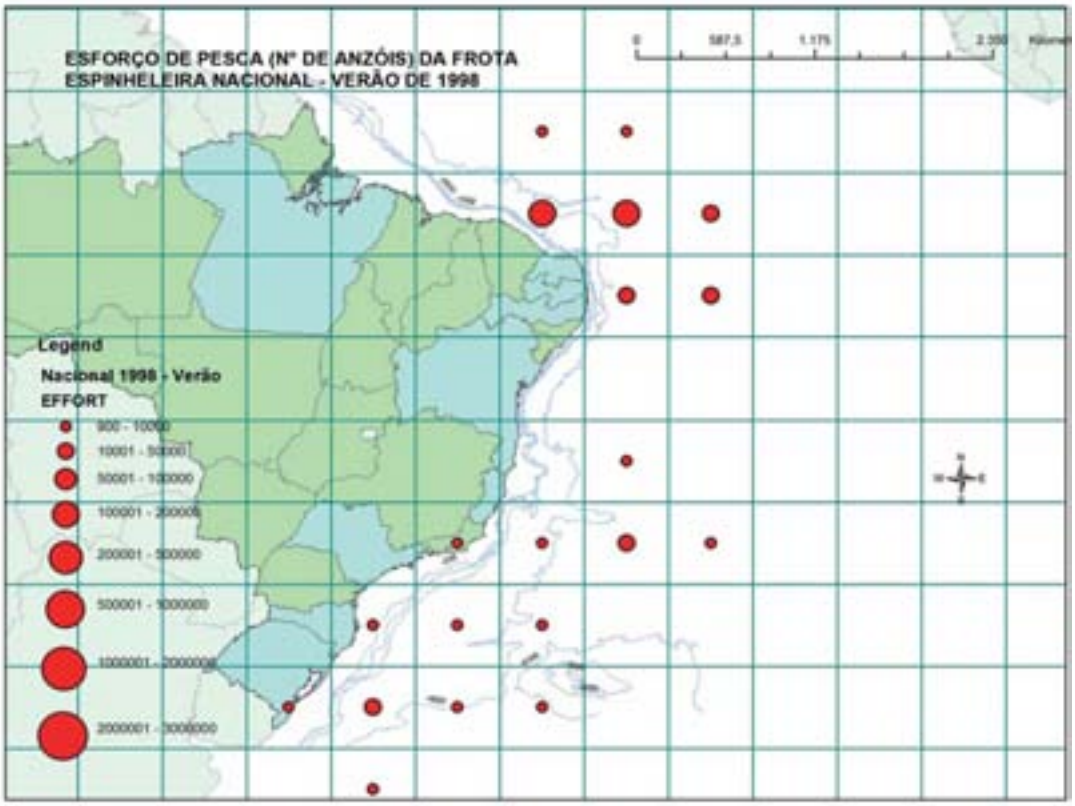
Fishing effort of the leased longlining fleet (winter/2002)



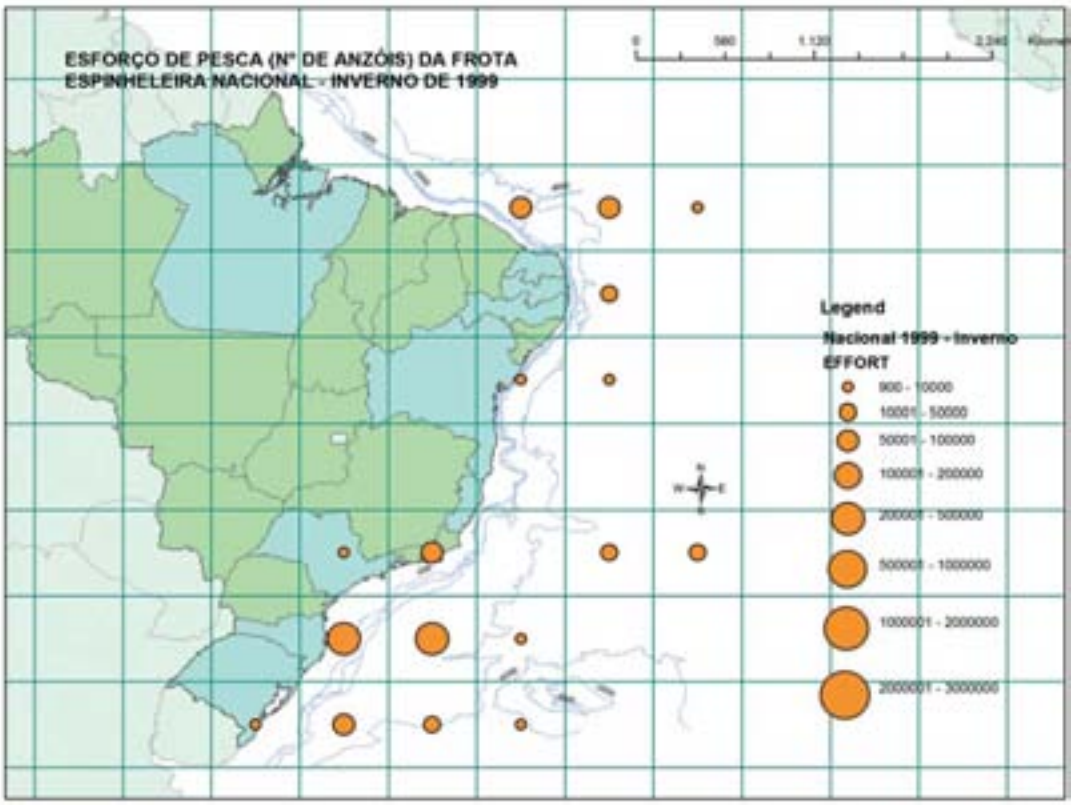
Fishing effort of the leased longlining fleet (summer/2002)



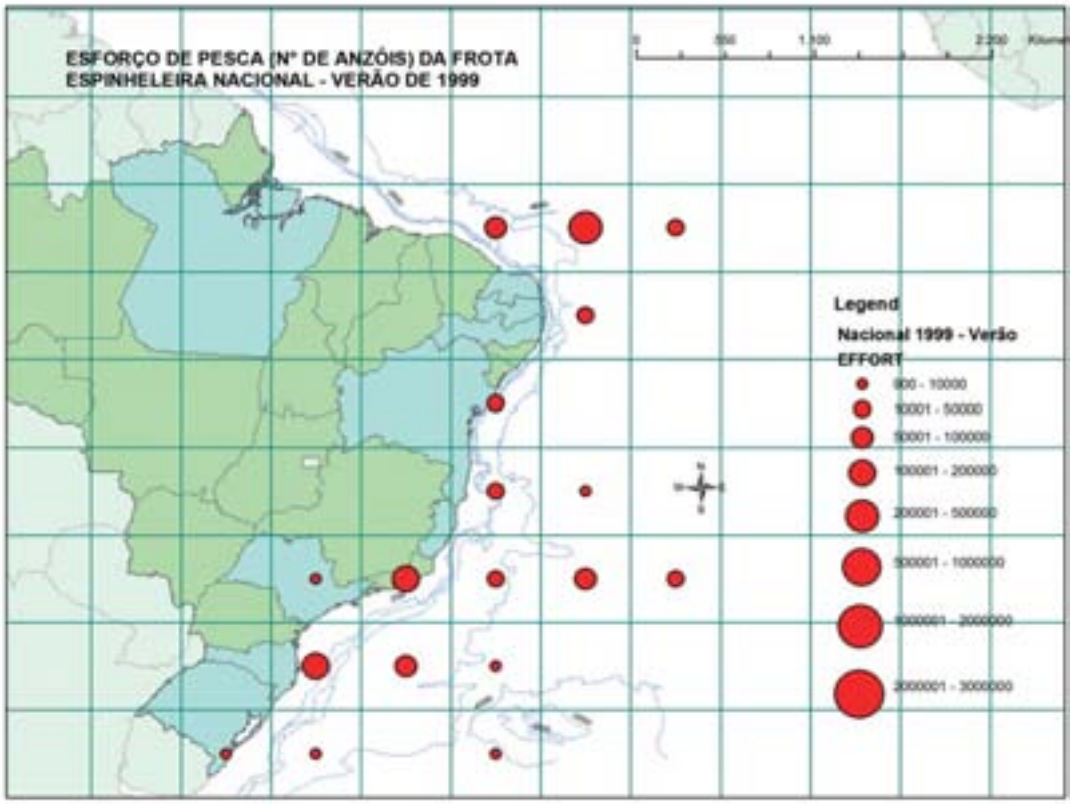
Fishing effort of the national longlining fleet (winter/1998)



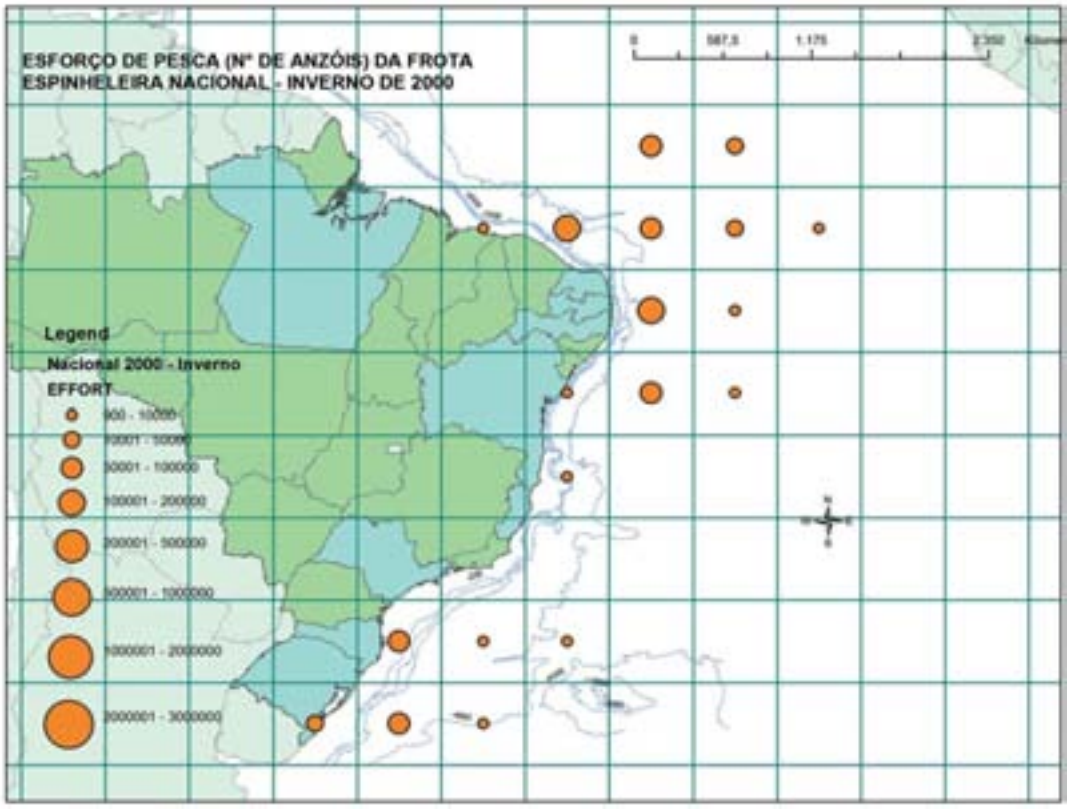
Fishing effort of the national longlining fleet (summer/1998)



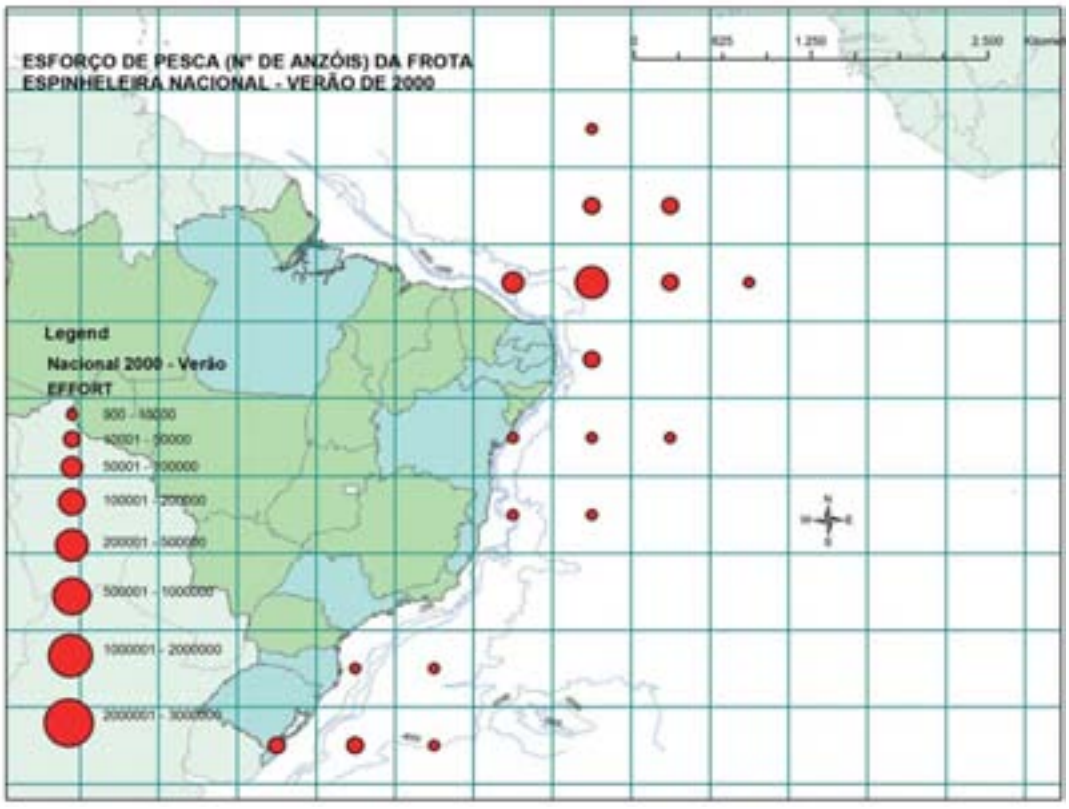
Fishing effort of the national longlining fleet (winter/1999)



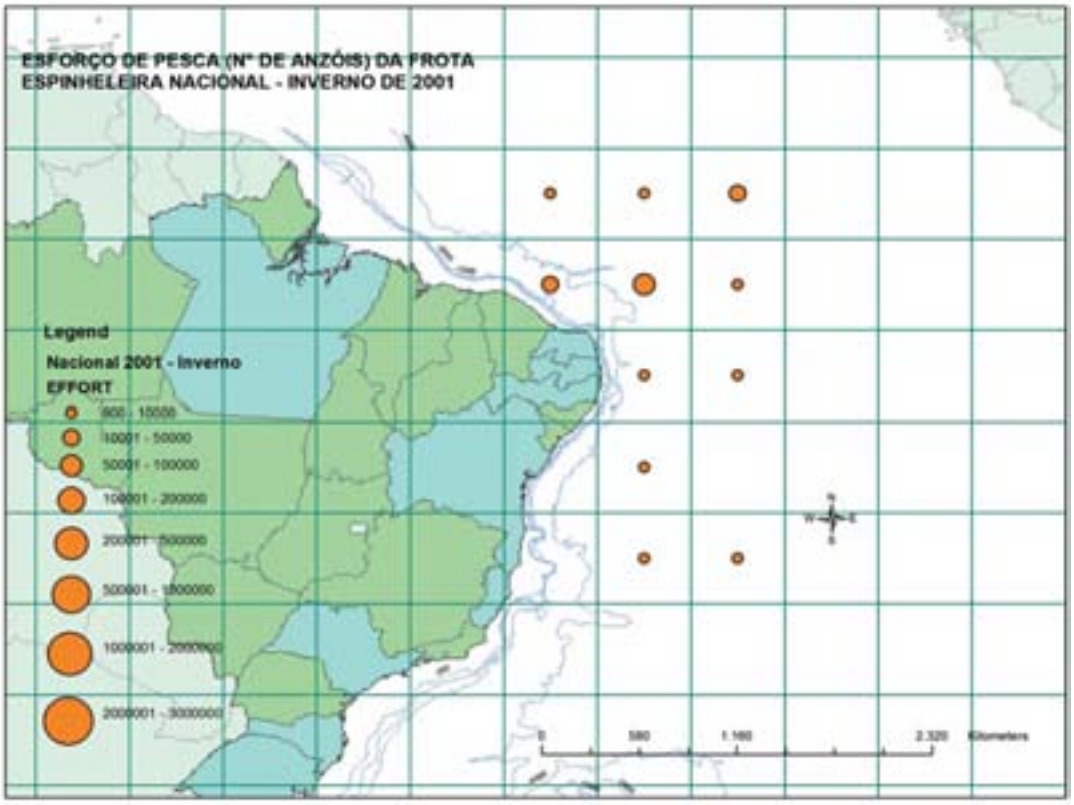
Fishing effort of the national longlining fleet (summer/1999)



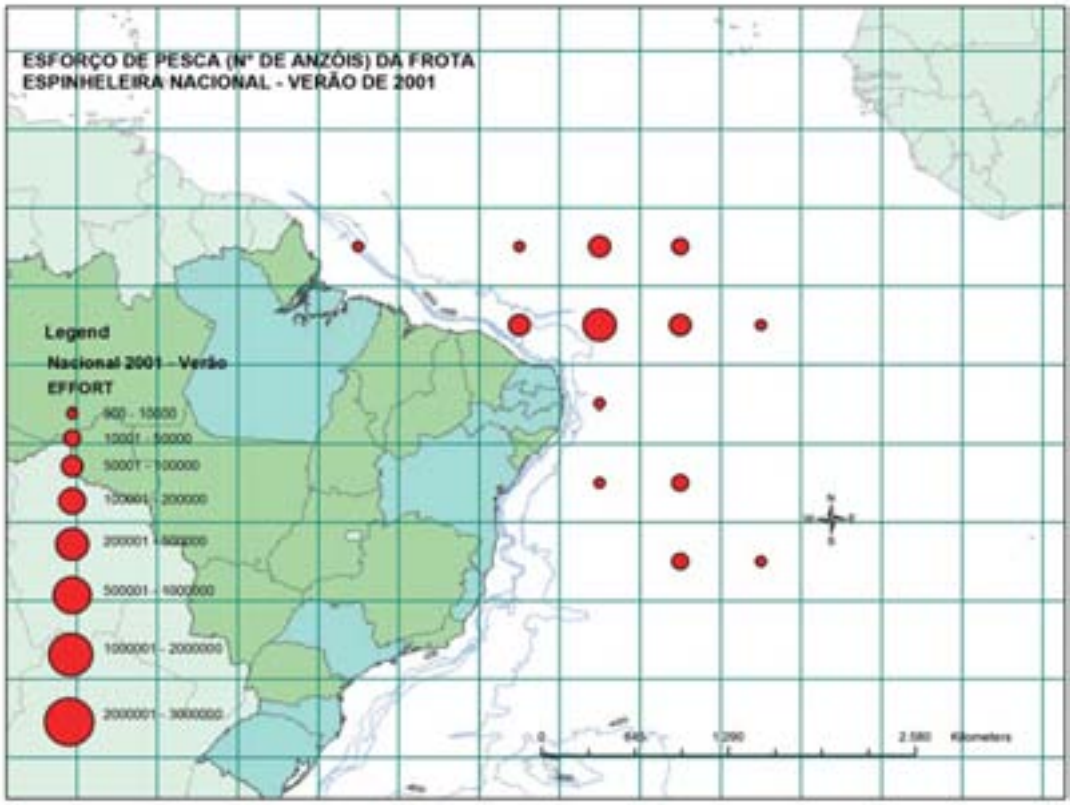
Fishing effort of the national longlining fleet (winter/2000)



Fishing effort of the national longlining fleet (summer/2000)

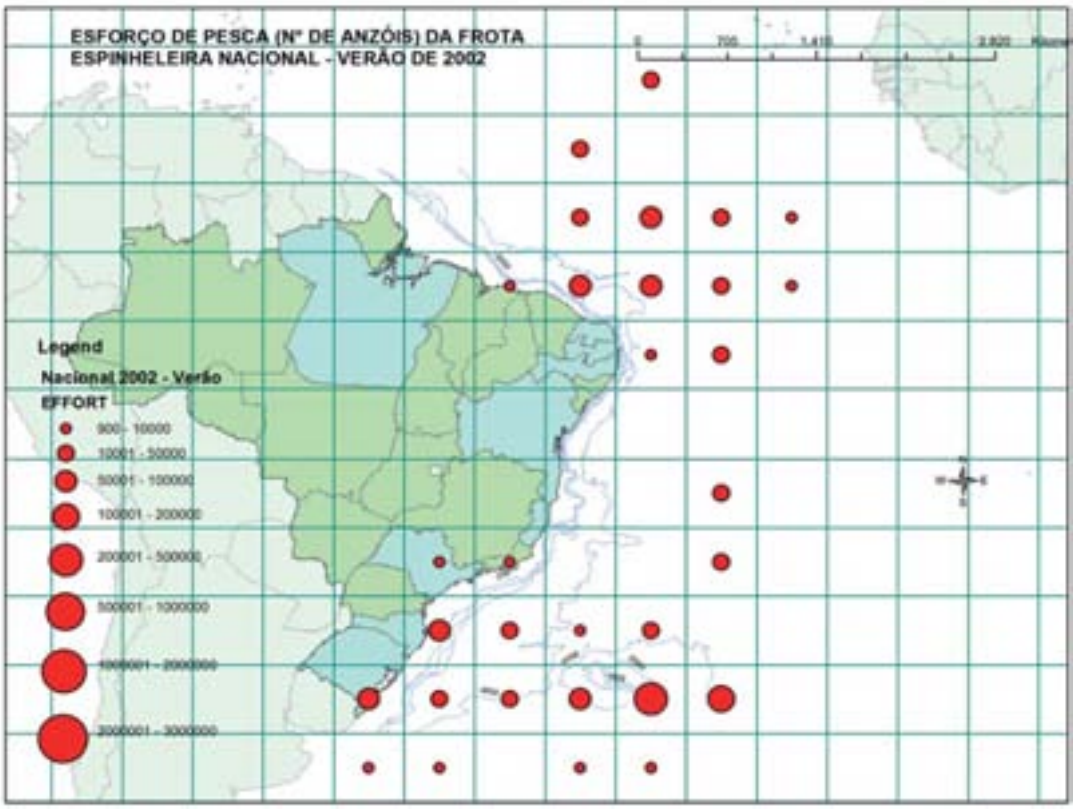


Fishing effort of the national longlining fleet (winter/2001)



Fishing effort of the national longlining fleet (summer/2001)

Fishing effort of the national longlining fleet (winter/2002)



Fishing effort of the national longlining fleet (summer/2002)

Appendix V: Edict that created the Working Group for the Conservation of Albatrosses and Petrels

EDICT n° 55/04-N, from 06/01/2004.

The President of the INSTITUTO BRASILEIRO DO MEIO AMBIENTE E DOS RECURSOS NATURAIS RENOVÁVEIS - IBAMA, using the attributions stated in the art. 24, Annex I, of the Regimental Structure approved by the Decree n° 4.756, of June 20th, 2003, and art. 95, item VI from the Internal Regiment approved by the Decree GM/MMA n° 230, of May 14th, 2002;

Considering that from the 113 known species of albatrosses and petrels, 43 (38%) use the Exclusive Economic Zone from Brazil, and 19 of them interact directly with the longline fisheries, nine suffer incidental mortality, and among them one is considered as critically endangered, two are endangered, four are vulnerable and two are near threatened, according to the criteria of IUCN;

Considering the International Plan of Action for the Reduction of the Incidental Capture of Albatrosses and Petrels by Longline Fisheries, developed and proposed by FAO, on 1998, and increasing international concern regarding this question;

Considering that Brazilian adhered to the International Agreement for the Conservation of Albatrosses and Petrels, on June 2001; and

Considering the results of the first Brazilian Workshop for the Conservation of Albatrosses and Petrels, conducted by IBAMA on October 2001, and even as part of the Brazilian Strategy for the Conservation of Albatrosses and Petrels,

RESOLVES:

Art.1º To create a Working Group for the Conservation of Albatrosses and Petrels, with the following composition

I) Representatives from the Federal Government

a) The Fauna General Coordinator- CGFAU/DIFAP/IBAMA;

b) The Fauna Species Protection Coordinator - COFAU/CGFAU/DIFAP/IBAMA;

c) A representative of the Fisheries Resources Management General Coordination - CGREP/DIFAP/IBAMA;

d) A representative of the National Research Center for the Wild Birds Conservation - CEMAVE/IBAMA;

e) A representative of the Executive Manager IBAMA/SP;

f) A representative of the Ministry of the Environment - MMA - Program Revizee;

g) A representative of the Special Secretariat of Aquiculture and Fisheries of the Presidency of Republic - SEAP;

h) A representative from the Division of Environment from the Foreign Affairs Ministry - DEMA/MRE.

II) Representatives of Class Entities

a) A representative of the National Council of Fisheries and Aquiculture - CONEPE

III) Specialists:

a) Alexandre Filippini;

b) Carolus Maria Vooren;

c) Edison Barbieri;

d) Fábio Olmos Correa Neves;

e) Jules Marcelo Rosa Souto;

f) Tatiana da Silva Neves

Art. 2º The Working Group for the Conservation of Albatrosses and Petrels, is a consultative body, and will be chaired by the Fauna and Fisheries Directorate, through the Fauna General Coordinator CGFAU/DIFAP/IBAMA, which, in case of impediment, will be replaced by the Fauna Species Protection Coordinator - COFAU/CGFAU/DIFAP/IBAMA, with the secretariat under Tatiana Neves.

Art.3º The Working Group will exist for 02 (two) years from the date of the publication of this Edict.

Art.4º The actions and other competences of the Working Group shall be established in the published Internal Rules attached to this Edict.

Art.5º This edict becomes effective from the date of its publication.

MARCUS LUIZ BARROSO BARROS

President

Published in the Government Official Diary from 06/02/2004, Section 1, page 67.