

ALBATROSS TASK FORCE

10 years of conservation action



BirdLife International Marine Programme

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Partnership for
nature and people

ACRONYMS

ACAP	Agreement on the Conservation of Albatross and Petrels
ATF	Albatross Task Force
CCAMLR	Commission for the Conservation of Atlantic Marine Living Resources
NPOA-S	National Plan of Action for Reducing the Incidental Catch of Seabirds
RFMO	Regional Fishery Management Organisation
RSPB	Royal Society for the Protection of Birds
TDR	Time Depth Recorder

Cover photo: Southern royal albatross
Leo Tamini

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INTRODUCTION

In 2004, a group of international seabird biologists and fishery experts discussed the situation they were witnessing across the southern oceans; seabirds were being incidentally caught in all of the major longline and trawl fisheries at rates that were, without doubt, unsustainable. Evidence of rapid population declines in the South Atlantic had long since confirmed the concern.

In the previous decade, conservation scientists had found solutions that rapidly reduced the bycatch of seabirds in longline fisheries, which had been put into practice with great success in the fisheries managed by the Commission for the Conservation of Atlantic Marine Living Resources (CCAMLR). This seminal work provided a series of lessons for other fisheries to learn from. At the same time, the RSPB and BirdLife International were part of efforts to create international fisheries regulations on seabird bycatch. However, there was a missing link between the contemporary science and the decks of fishing vessels, and in particular throughout high-risk fleets in southern Africa and South America.

In order to introduce and implement solutions that would successfully prevent seabird bycatch in high-risk fisheries, a team of dedicated practitioners was required to work at sea together with fishing crews to demonstrate seabird bycatch mitigation measures *in situ*. The Royal Society for the Protection of Birds, on behalf of the BirdLife International partnership, made an ambitious move, launching the Albatross Task Force (ATF), the world's first international team of bycatch mitigation instructors. The main objective of the ATF is to *reduce the bycatch of albatross and petrels in targeted fisheries, and ultimately to improve the conservation status of threatened seabirds*.

The ATF began operations in Cape Town, South Africa in 2006, where work was already underway to identify seabird bycatch levels in the trawl and longline fisheries, and the government had introduced seabird bycatch conservation measures, although compliance levels were extremely low. The work of the first team therefore concentrated on generating higher compliance with measures through at-sea practical demonstrations. The initial successes of the South African team provided an example for other countries to follow. Since then, the ATF has gone from strength to strength, expanding into eight countries and tackling ten of the most deadly fisheries for seabirds in the world. This report reflects on the advances in those fisheries and the future challenges facing the ATF.

None of the advances the ATF has made would be possible without the generous support of the RSPB membership and private sponsors and donors, as well as from the David and Lucile Packard Foundation, The Tilia Fund, The National Fish and Wildlife Foundation, and Páramo Directional Clothing.

ARGENTINA

Aves Argentinas

Leo Tamini, Nahuel Chavez & Ruben Dellacasa



Target fisheries

The Patagonian Shelf stretches over 1.9 million km² and is one of the world's most productive Large Marine Ecosystems, with fisheries targeting groundfish such as hake *Merluccius hubsi* and kingclip *Genypterus blacodes*, mainly through the use of demersal trawl nets. Our first target fishery was the large industrial trawl fleet, numbering 33 vessels based in the port of Mar del Plata. A second fleet of ~60 smaller trawlers store fish on ice and many of these haul the nets over the side of the vessel. A third fleet of mid-water trawlers targets hoki *Macruronus magallanicus* and southern blue whiting *Micromesistius australis* and is based in the port of Ushuaia.

Team highlights

The ATF was initiated in Argentina in 2008 and began monitoring the industrial trawl fleet, where bycatch rates of 0.36 birds / hour were identified through collisions with trawl cables. The team immediately tested bird-scaring lines in the fishery and conducted experimental trials to compare trawls with and without bird-scaring lines. The cumulative monitoring over several years permitted a robust estimate of annual seabird bycatch, which found at least 17,858 seabirds were being killed per year in the industrial trawl fleet alone, of which 13,548 (8,001 - 19,673) were black-browed albatross *Thalassarche melanophris*.

In Argentina, the very strong crosswinds typical of the Argentine Sea, cause bird-scaring lines to be blown and tangled across the trawl cables. Therefore, from his very first voyage, team leader Leo Tamini worked with fishing crews to develop the first prototype of the "Tamini Tabla", a towed device which stabilizes bird-scaring lines through the use of 45 degree keels. The Tabla has now been developed and commercially produced. ATF testing proved that bird-scaring lines eliminated seabird mortality caused by collisions with trawl cables. By 2013, bird-scaring lines were recommended through the Argentine National Plan of Action for the reduction of seabird bycatch (NPOA-S), as a short- to medium-term measure to mitigate seabird mortality in the fishery. But firm government regulations were not in place. Following a lengthy process of lobbying government and industry, a pilot was undertaken in 2015 to test use of bird-scaring lines on ten vessels of the fleet, with a view to regulations and fleet-wide roll-out of bird scaring lines by 2016. The ATF has trained national fishery observers in seabird identification, data collection and compliance monitoring, and we are poised to overcome the final hurdle in this fleet. A change in government in Argentina in late 2015 delayed the important legislation, but this is something we are pursuing with full force in 2016.

In 2014-2015, we have also begun scoping the scale of seabird bycatch in the second and third fleets in Argentina. In the side-hauling trawlers, we estimate a mortality rate of up to 0.27 birds / trawl. In

the last few months, we have our first observations from the mid-water fleet; initial results demonstrate a bycatch rate of 0.18 birds / trawl, with Northern Royal albatross *Diomedea sanfordi* from New Zealand among the species affected. Using all that we have learnt from our first fleet, and the government connections made, our aim is that, within 2 years, we will have both estimated the scale of bycatch in these remaining fisheries, and demonstrated solutions, with reductions achievable by 2020.

Photo: Southern royal albatross in the austral mid-water trawl fishery
Nahuel Chavez



BRAZIL

Projeto Albatroz & SAVE Brasil

Tatiana Neves, Augusto Silva-Costa & Rodrigo Claudino



Target Fishery

The main target fishery in Brazil is the pelagic longline fleet, which comprises 58 active vessels, although the registered vessel list includes 72 boats. Prior to the ATF starting, the first comprehensive report on bycatch rates indicated a bycatch rate of 0.23 birds / 1,000 hooks for the fleet, and as high as 0.542 birds / 1,000 hooks in the peak season (austral winter) when seabirds are most abundant¹. This represents 2,061 (324 - 4,878) birds killed per year, although we think this is likely to be an underestimate. This level is lower in magnitude than bycatch in the Argentina trawl fisheries for example, but includes threatened species such as the Tristan *Diomedea dabbenena* and Atlantic yellow-nosed albatross *Thalassarche chlororhynchos* and spectacled petrel *Procellaria conspicillata*. And bycatch rates are still among the highest worldwide.

Team highlights

The ATF began work in 2007, actually finding seabird bycatch levels as high as 1.0 bird / 1,000 hooks, with some captains reporting bycatch of as many as 8.0 birds / 1,000 hooks over the winter months. Working with the industry, the team conducted experimental mitigation trials over several years demonstrating that the combination of night-setting, bird-scaring lines, and line weighting reduced bycatch to negligible levels. The work in Brazil has been pivotal to defining best practice advice in the Agreement on the Conservation of Albatross and Petrels (ACAP).

Through engagement with the Brazilian NPOA-S and the Fisheries and Environmental Ministries, these results drove the introduction of regulations in 2011, requiring all longline vessels to use both bird-scaring lines and line weighting of 60 g within 2 m of the hook, as well as a recommendation for all lines to be set at night. By this point too, the ATF had engaged with all 58 vessels in the fleet, demonstrating the use of mitigation measures, and ensuring that all vessels had these on board. In 2014, 172 days of observations at sea recorded zero bycatch.

However, in 2015 our team faced an unexpected challenge. On board vessels in which we had encouraged captains to fish as they normally do, we found a seabird bycatch rate of 0.39 birds / 1,000 hooks. The explanation, we believe, lay in the tension that fishermen had expressed around use of line weights: in 2014, the Brazilian government had relaxed line weight requirements to 60 g within 3.5 m of the hook, albeit requiring vessels to also fish at night. Analysing our 2015 data, we were able to prove that 3.5 m at 60 g was ineffective, and, moreover, that very few captains were using the bird scaring lines. The silver lining to this challenge is that ACAP rapidly responded in early May 2016 to strengthen its line weight advice, eliminating 60 g at 3.5 m as an option.

¹ Bugoni, L., Mancini, P.L., Monteiro, D.S., Nascimento, L., and Neves, T. 2008. Seabird bycatch in the Brazilian pelagic longline fishery and a review of capture rates in the southwestern Atlantic Ocean. *Endangered Species Research*, 5: 137-147.

The Brazilian fleet is one of our most challenging fisheries. We have had thorough outreach across the fleet, but success now requires effective compliance monitoring as well as re-strengthening of the line weight requirement. The latter is being progressed via the Atlantic Tuna Commission (ICCAT). For compliance, we have begun a test of electronic monitoring in 2016. We have a third line of pursuit for this fishery too: our tests comparing Hookpods and standard fishing gear in Brazil have recorded a bycatch rate of 0.13 birds / 1,000 hooks when using Hookpods, compared to over 7.0 birds / 1,000 hooks with standard fishing gear. Hookpods have proven popular with industry during these trials and could provide the solution that suits this complex fishery.

Photo: Augusto Silva-Costa rescuing a White-chinned petrel
Augusto Silva-Costa



CHILE

CODEFF

Luis Cabezas & Cristián Suazo



Target Fisheries

The Chilean coast extends over 2,600 miles and three marine eco-regions are recognised: the Humboldt Current to the north, the southern cone and fjords to the south, and the offshore oceanic islands. Chilean fisheries exploit globally important fish resources, through surface and demersal longline fleets, demersal and mid-water trawl fisheries, purse seine and gillnet fleets.

Team highlights

In 2007 the team started working with the pelagic longline fleet. Low bycatch rates were found, but birds caught were often great albatrosses. As the National Observer Agency regularly manages close to 100% coverage, our strategy in Chile involved training observers in seabird identification, bycatch monitoring and use of mitigation measures. At sea, the ATF concentrated on conducting sink rate experiments and testing alternative bird-scaring line designs to give advice on the best practice mitigation options for different vessels in the fishery. The larger vessels, which were found to cause the majority of bycatch, subsequently left the fishery and ever since, the smaller vessels have been effectively monitored by the observers, with minimal bycatch.

The team then moved to work with the central trawl fishery, developing the first seabird bycatch estimate. This indicated a bycatch rate of 0.39 and 0.09 birds / trawl during the winter and summer period, respectively, with an annual bycatch of 890 (438 - 1,418) birds / year. Experimental results demonstrated mortality was reduced to zero when using bird-scaring lines. This information was presented to the fisheries association and reported at the Chilean National Biodiversity Committee and is being included in the review of the Chilean NPOA-S. The National Observer Agency, Fisheries Ministry and the Marine Stewardship Council certifying body for the fishery were informed and this progress was presented to the Agreement on the Conservation of Albatross and Petrels.

Through monitoring of the purse seine fishery, which targets anchovy and sardine, the team discovered high bycatch of pink-footed shearwaters *Ardenna creatopus*. Collaboration with a local fishing net construction company was therefore set up to design new nets cutting out excess mesh. Subsequent experiments have proven that this reduction in excessive mesh is reducing the bycatch of shearwaters, and work is ongoing to continue tests and deliver best practice advice to the government and ACAP. Globally, this represents documentation which is the first of its kind to present both problem and solution of seabird bycatch in purse seine fisheries.

The diversity of fleets in Chile and the number of active vessels is one of the main challenges for our small team. The southern trawl fleet represents an important next step, where observer reports indicate high mortality rates.

Photo: Purse seine vessels anchored in Chile
Cristian Suazo



Target Fisheries

Ecuador has several fisheries including a small number of industrial vessels targeting large high-value pelagic fish species with longlines and purse seine nets, plus a fleet numbering thousands of small-scale vessels using gillnets, demersal longline and purse seine fishing gears to target a wide variety of fish species.

Team highlights

In late 2008, the ATF initiated activities in Ecuador to identify which fleets overlapped with the Critically Endangered waved albatross *Phoebastria irrorata*. The initial work included awareness raising and the formation of links with government and industry stakeholders and observer agencies. This culminated in two workshops to explain the issue of seabird bycatch and provide observer data collection protocols and seabird identification guides.

Following anecdotal reports of mortality, several observers were contracted to monitor the demersal longline fishery based in the port of Santa Rosa. Immediate seabird bycatch events were detected with several waved albatross and Parkinson petrels *Procellaria parkinsoni* observed killed. Certain aspects of the simple fishing gear and operation were identified as potential contributory factors, particularly in relation to the slow sink rate of hooks.

Experimental testing compared lines weighted with standardised 900 g weights made from solid concrete with those using the ~450 g stones which fishermen typically collect from beaches and deploy. Time Depth Recorders (TDRs) were used to measure the sink rates of each treatment. The heavier weights were found to sink significantly faster than traditional weighted lines. Since the heavier weights did not interfere with the fishing operation or reduce fish catch they were readily accepted by the fleet.

Towards the end of 2012, a workshop was held with the fishing community. The representatives indicated a general beneficial evolution of their fishing gear towards using heavier weights and more densely spaced hooks, to avoid gear drifting along the sea floor and entangling with rocks. Following several years of workshops and meetings, the fishing community displayed an increased awareness of the importance of seabird conservation and no further bycatch was observed by the ATF team. We are no longer working in Ecuador.

Photo: Waved albatross in Ecuador
Jorge Samaniego



NAMIBIA



Namibian Nature Foundation

Clemens Naomab & Samantha Matjila

Target Fisheries

The Benguela Current Large Marine Ecosystem runs from south to north along the entire extent of the Namibian coastline. The nutrient-rich waters reach the surface through permanent upwellings at intervals along the coast, driving one of the world's most productive fisheries. The fishing industry is based in the main port of Walvis Bay on the central coast and some vessels are also based at Luderitz in the south. The main target fish is hake *Merluccius spp*, with two species fished by both demersal trawl and longline vessels. There are also large pelagic longline, purse seine and mid-water trawl fleets active in Namibia.

Team highlights

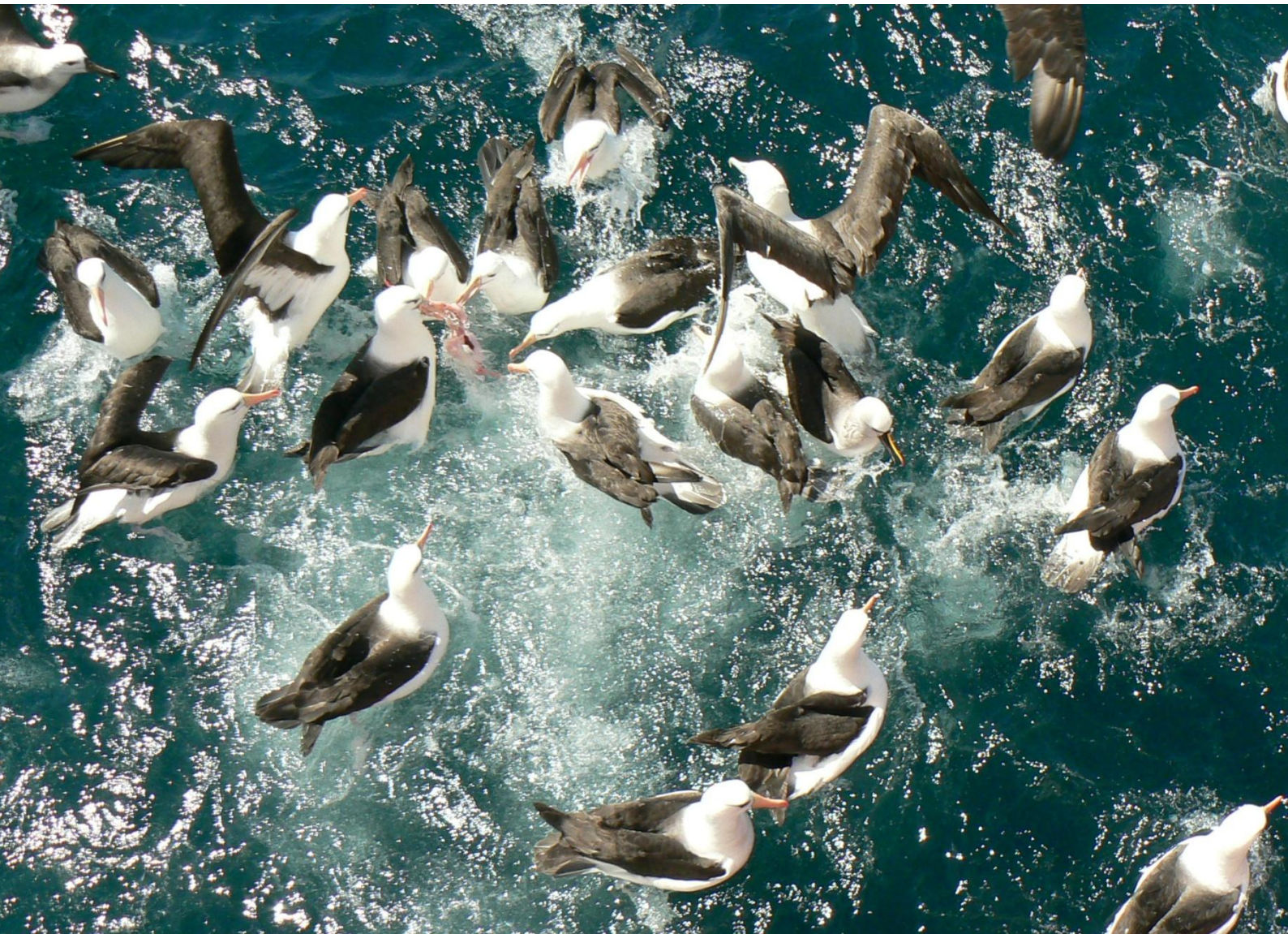
The ATF was launched in Namibia in 2008, through a series of meetings with 13 fishing companies, the Ministry of Fisheries Deputy Director of Operations and the Fisheries Observer Agency. The ATF began monitoring the demersal trawl fleet which highlighted a bycatch rate of 0.64 seabirds / hour, the majority of which were yellow-nosed albatross *Thalassarche chlororhynchos* and white-chinned petrels *Procellaria aequinoctialis*. Further ATF data produced an estimate of 8,088 (0 - 27,487) birds being killed each year in this trawl fishery alone, of which 5,010 (62%) were albatrosses. The experimental use of bird-scaring lines resulted in zero seabird deaths and a very low interaction rate with trawl cables – an order of magnitude improvement to when no bird-scaring lines are used.

Our first trips were then conducted in the demersal longline fishery, where extremely high bycatch rates were discovered, with our best estimate suggesting 20,567 (6,328 - 37,935) birds were killed / year, the majority (85%) being white-chinned petrels. Tests were conducted with single and paired bird-scaring lines and night setting which rapidly reduced seabird bycatch to negligible levels. The sink rate of baited hooks was investigated and the team found the line configurations sank hooks extremely slowly, exacerbating the risk of bycatch. Funding was acquired to construct 5 kg steel weights for the longline fleet, as the condition of the concrete line weights was poor, which was a large factor in the slow sink rate.

Through presentations of this work to government and industry, we helped update the Namibian NPOA-S and regulations were introduced in 2014, and gazetted in 2015. Our work since then has driven the adoption of mitigation measures in the fleet. Currently, 74% of demersal trawlers have bird-scaring lines installed and 79% of demersal longline vessels have bird-scaring lines and at least 50% of their weights meet the required line weighting. Our challenge is to ensure widespread compliance and demonstrate significant reductions in bycatch across both the fleets now regulations have been adopted.

Looking ahead, we are also beginning the first ever monitoring of seabird bycatch in the Namibian pelagic longline fleet in 2016.

Photo: Atlantic yellow-nosed and black-browed albatross in Namibia
Clemens Naomab





Target Fisheries

Bycatch of the Critically Endangered waved albatross was observed in the demersal longline fishery for hake in Ecuador, and this type of fishery is also active in northern Peru. To investigate the possibility of similar bycatch issues in northern Peru, the ATF began monitoring demersal longline fisheries in Peru in February 2012 from the port of Mancora, where approximately 40 vessels operate. Drift net fisheries are also widespread across Peru, and overlap with the dense and diverse seabird assemblage of the Humboldt Current, including penguins as well as albatrosses and petrels.

Team highlights

An initial fishery diagnostic was conducted in 2012, indicating the longline fleet typically performs a single set per day, deploying around 2,000 hooks to a depth of 200 metres. On board observation was carried out on vessels of the longline fleet to identify levels of seabird bycatch. Despite heavy coverage while seabirds, including the waved albatross, attended vessels, no interactions were recorded and no bycatch was observed. The sink rate of the slowest sinking hooks (in the middle of weights) was measured, indicating a relatively fast sink rate of 0.57 m / sec down to 10 m.

Additional fisheries based in San Jose in the north and Chorillos in central Peru were monitored in subsequent years after anecdotal reports from port contacts suggested waved albatross were occasionally caught in drift net fisheries. Bycatch of multiple seabird species was observed. Our observations in 2014 recorded 25 birds entangled in 233 observed sets. Five of these were released alive, with the remainder discarded dead. Four pink-footed shearwaters were caught in Chorrillos while white-chinned petrels comprised 24% of all observed seabird bycatch. When scaled up across the hundreds of vessels in the drift net fishery, even relatively low bycatch rates per vessel could be causing severe impacts to seabird populations.

In 2015, the first experimental mitigation tests began, using net lights as a bycatch deterrent. Testing was conducted using a control (without lights) and experimental nets (with lights), to calculate both target species catch and bycatch. From 105 sets, a total of 11 birds were entangled including a Humboldt penguin *Spheniscus humboldti* and two Cook's petrels *Pterodroma cookii* caught alive and released, plus there were two pink-footed shearwaters, one unidentified petrel, a white-chinned petrel, one Markham's storm petrel *Oceanodroma markhami*, a Cook's petrel, and a single Peruvian booby *Sula variegata* killed. Apart from one green turtle *Chelonia mydas* incidentally captured in the illuminated net treatment, all turtle and marine mammals were caught in control nets. There was no bycatch of seabirds in the illuminated net panels.

This represents exciting initial evidence that this measure may be effective at reducing multi-taxa bycatch in the fishery without affecting target species catch. Once we have a greater data collection to confirm these early results, our challenge will be to identify strategies to implement mitigation in small-scale fleets.

Photo: Drift net fishing in Peru
Joanna Alfaro



SOUTH AFRICA

BirdLife South Africa

Ross Wanless, Bronwyn Maree, Bokamoso Lebepe



Target Fisheries

Cape Town is situated at the confluence of two oceans and the surrounding seas are rich in nutrients. Several fisheries operate from the ports around Cape Town, including a large demersal trawl fleet, a demersal longline fishery and a pelagic longline fishery for swordfish and tunas. Permit conditions in South Africa required longline vessels to use mitigation measures before the ATF was launched, but compliance was extremely low.

Team highlights

In 2006, the first ATF team was launched in South Africa, and the team of three instructors initiated at-sea monitoring to evaluate the three main fisheries. Results indicated a bycatch of 0.34 birds per 1,000 hooks in the pelagic longline fishery, and a preliminary baseline estimate of 9,300 (4,800 - 18,600) birds killed per year in the trawl fishery. Bird-scaring lines and line weighting were tested in both the pelagic and demersal longline fisheries, and bird-scaring lines in the trawl fishery.

In 2008, a foreign flagged pelagic longline fleet began operating in South African waters, and national observers reported high levels of seabird bycatch. The ATF team played a major role in the rapid implementation of new permit conditions for this fishery, placing a cap of 25 seabirds as the bycatch limit. The result was an increase in seabird mitigation compliance and an 84% decrease in bycatch levels. The foreign flagged pelagic longline fleet has since continued to catch seabirds at a low rate of ~0.06 birds per 1,000 hooks. A seabird bycatch cap was also implemented in the domestic pelagic longline fishery, and from ATF observations bycatch was reduced from 0.23 to 0.07 birds per 1,000 hooks through the use of line weighting and bird-scaring lines.

By 2013, ATF multi-year monitoring of the trawl fishery was published, indicating an incredible 99% reduction in albatross mortality in the fishery since the original baseline estimates. Bronwyn Maree was awarded the Future for Nature Award for her contribution to seabird conservation in South Africa.

The team supported the development of vessel-specific Bird Mitigation Plans in the trawl fishery, where each vessel is assessed to fine-tune its bycatch mitigation measure designs. By 2014, there was no need to refine regulations further in the trawl fleet. Optimum bird-scaring line designs were working in the trawl fishery and there was widespread understanding of seabird bycatch issues and requirement of bird-scaring lines. With bycatch reduction targets now achieved, the ATF team in South Africa has moved to a monitoring and sustaining role. Through funding from a GEF project, the team is undertaking a pilot test of electronic monitoring in 2016-2018, which may be a tool to aid

long-term sustainable bycatch reductions in the South African fleets. It has also begun a port-outreach project to reach distant water vessels which use Cape Town as a port.

Photo: Black-browed albatross in South Africa
Bronwyn Maree



URUGUAY

Proyecto Albatros y Petreles

Andrés Domingo, Sebastián Jiménez & Rodrigo Forselledo



Target Fisheries

In Uruguay, the cold Falklands / Malvinas Current from the south merges with the warm Brazilian Current from the north where the River Plate flows into the South West Atlantic Ocean. The mixing of these three bodies of water creates extremely nutrient rich fishing grounds which also form a foraging hotspot for many seabirds. The main Uruguayan fisheries that interact with albatrosses and petrels include the pelagic longline fleet for tuna and swordfish and the demersal trawl fishery for hake. The latter has been the main Uruguayan fishery since 1977.

Team highlights

The Uruguayan ATF team began in 2008, collaborating with the National Observer Programme to monitor the pelagic longline fleet. Initial seabird bycatch estimates revealed 0.42 birds per 1,000 hooks associated with daylight sets and without mitigation measures. Bycatch estimates were developed for the main species affected (yellow-nosed and black-browed albatross, white-chinned petrel, and, importantly, wandering albatross from South Georgia).

Experimental mitigation trials over several years completed 100 experimental sets and indicated a catch rate of 0.85 birds per 1,000 hooks in the absence of a bird-scaring line, compared with 0.13 birds per 1,000 hooks with a bird-scaring line. As baited hooks were being attacked beyond the extent of the bird-scaring line, additional experiments compared 65 g line weights placed at 1 m from the hook compared with the industry standard of 75 g at 4.5 m from the hook, and found the use of weights closer to the hook effectively doubled the sink rate and drastically reduced seabird bycatch. ATF experimental results on both commercial vessels and the government research vessel have been fundamental to updating the Uruguayan NPOA-S, and to strengthening ACAP best practice advice on line weights.

Since 2013, the Uruguayan domestic longline fleet has not been operating. However, between 2009 and 2013, Japanese vessels were licensed to fish in Uruguayan waters, and seabird bycatch was recorded by scientific observers. The ATF provided port training for this Japanese pelagic longline fleet, and supported the National Observer Programme in the provision of mitigation measures for these vessels. The team helped to construct new bird-scaring lines for each of the Japanese vessels and developed a practical instruction manual for the deployment of bird-scaring lines which was translated into Japanese with help from Japan Tuna. Setting lines at night and using bird-scaring lines rapidly reduced bycatch rates to a minimum in this fleet.

Photo: Sunset at sea in Uruguay
Sebastián Jiménez



DISCUSSION

Recognising the need to bridge the gap between conservation scientists and the fishing industry, the RSPB launched the Albatross Task Force to tackle the most important threat to seabird populations, the incidental bycatch of vulnerable seabirds in longline and trawl fisheries. Ten years after the launch of the first ATF team in South Africa, the situation has improved markedly.

The ten original ATF target fisheries were the Argentinean industrial trawl fishery; Brazilian pelagic longline fishery; Chilean central-southern demersal trawl fishery and pelagic longline fishery; Namibian demersal trawl and longline fisheries; South African demersal trawl and pelagic longline fishery; Uruguayan pelagic longline fishery and the small-scale demersal longline fishery in Ecuador.

Collectively, since the ATF was launched, the teams have completed a staggering 5,196 days of at-sea monitoring, attended 908 meetings with government, industry and fishery stakeholders, and conducted 3,358 port visits (Figure 1).

For the ATF teams, one of the vital first steps in each fishery was the identification of baseline seabird bycatch rates (Table 1). With the exception of South Africa and Brazil, there were no robust estimates available. At the same time, this work afforded ATF instructors firsthand experience of the characteristics of the particular gear and operation of each fishery. This was critical to understanding and later designing experimental tests to trial bycatch mitigation measures.

Table 1: ATF baseline bycatch rates and annual bycatch estimates for target fisheries

Location	Fishery	Bycatch rate	Unit	Annual bycatch estimate
Argentina	Demersal trawl	0.237	Birds / hour	13,548 (8,001 - 19,673) BBA
Brazil	Pelagic longline	0.23	Birds / 1,000 hooks	2,376 (737 - 4630)
Chile	Demersal trawl	0.393 (winter)	Birds / trawl	890 (438 - 1,418)
Chile	Demersal trawl	0.098 (summer)	Birds / trawl	309 (138 - 506)
Ecuador	Demersal longline	0.150	Birds / 1,000 hooks	-
Namibia	Demersal longline	0.630	Birds / 1,000 hooks	20,567 (6,328 – 37,935)
Namibia	Demersal trawl	0.085	Birds / hour	8,088 (0 – 27,487)
South Africa	Pelagic longline	0.160	Birds / 1,000 hooks	See note ²
South Africa	Demersal trawl	0.150	Birds / hour	9,300 (4,800–18,600)
Uruguay	Pelagic longline	0.281	Birds / 1,000 hooks	530 (183 – 1,353)

² Our team does not have access to a sufficient level of fishery effort data, which is extremely variable in space and time and makes producing an annual estimate very difficult.

Developing baseline estimates is time-consuming and challenging, since monitoring must be representative of all seasons and geographical areas. Sometimes this is simply not possible, especially as ATF instructors are only able to access vessels that are willing to voluntarily receive an observer. Considering this limitation, the most effective way of improving our understanding of spatial and temporal variations is by collecting as much data as possible over several years.

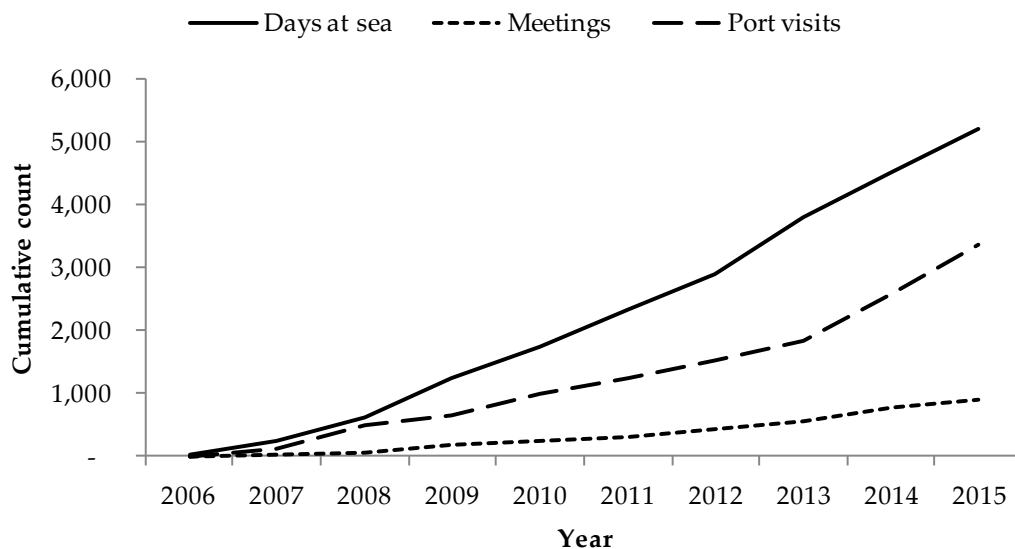


Figure 1: Cumulative ATF effort in terms of days at sea, meetings and port visits

The ATF has been particularly successful in the experimental testing and development of mitigation measures for our target fisheries, and the subsequent practical demonstration of their effectiveness for a wide range of fishery stakeholders. From the outset, and particularly since 2009, the ATF has also conducted at-sea mitigation research, comparing standard fishing operations (no mitigation) with experimental treatments (using mitigation). This built up strong science-based evidence of baseline mortality, as well as proof of the efficiency of mitigation measures (Table 2).

Table 2: Demonstrated seabird bycatch reductions in ATF target fisheries

Location	Fishery	Mitigation	Reduction reported	Source
Namibia	Demersal longline	Bird scaring line Paired BSL	86% all birds 98% all birds	Paterson <i>et al</i> , In Press
Namibia	Demersal longline	Line weighting	75% all birds	Paterson <i>et al</i> , In Press
Argentina	Demersal trawl	Bird scaring line	100% all birds	Tamini <i>et al</i> , 2015
Chile	Demersal trawl	Bird scaring line	100% all birds	BirdLife Int, 2013a
Namibia	Demersal trawl	Bird scaring line	100% all birds	BirdLife Int, 2013c
South Africa	Demersal trawl	Bird scaring line	99% albatross	Maree <i>et al</i> . 2014
Uruguay	Pelagic longline	Bird scaring line	100% all birds	BirdLife Int, 2011a
Uruguay	Pelagic longline	Bird scaring line	88% all birds	Domingo <i>et al</i> . 2011
Uruguay	Pelagic longline	Bird scaring line	85% all birds	Domingo <i>et al</i> . 2013
Uruguay	Pelagic longline	Line weighting	50% all birds	Jimenez <i>et al</i> . 2013

This information has been used in our in-country lobbying for the generation of NPOA-S in each country and the adoption of mitigation measures in high-risk fisheries. All countries where the ATF is active have adopted NPOA-S or Species Action Plans (in the case of Ecuador and Peru) and ATF staff have played an important role in the provision of data for the plans. In turn, the NPOA-S created a national mechanism through which the ATF generated political leverage for the introduction of fisheries legislation.

Of the original fisheries identified, seven out of ten have now adopted regulations that require vessels to implement seabird bycatch mitigation. We are now concentrating on delivering the final stages of lobbying for regulations to implement fleet-wide adoption of mitigation measures in the remaining two industrial fisheries: the Argentinean trawl fleet and Chilean trawl fleet. Advances in both these countries have been repeatedly delayed by government. However, this year we have overcome similar difficulties in Namibia, where regulations are now leading to rapid uptake of mitigation measures, with measures installed in over 70% of both the longline and trawl fleet. The small-scale fishery in Ecuador is unlikely to implement regulations, but multi-year monitoring detected no further bycatch. The fleets in Peru were not included in the original target fisheries, and regulations are unlikely to be effective in a large unstructured fleet. An alternative approach is necessary for small-scale fisheries, which is discussed later.

Lessons learned

Despite successfully introducing regulations, our experience in Brazil has taught us that even highly efficient solutions with no effect on target species catch rates may not be implemented if the

industry perceive there to be additional work required to adopt best practice. All our data suggests that the deployment of bird-scaring lines in Brazil essentially eliminates seabird bycatch, but captains continue to fish without the use of this simple and economic measure, and as a result of this, together with the government's relaxation of line weight requirements, seabird bycatch rates remain high. Securing fleet-wide bycatch reductions is hugely challenging, and the ATF approach is to meet each obstacle with new solutions. In Brazil, the challenges of 2015 have already led to three lines of pursuit: we have successfully used our data as part of the evidence to strengthen ACAP's best practice advice on line weights (May 2016), we have begun an electronic monitoring trial in 2016, under GEF funding, as a compliance monitoring tool, and we have already conducted tests of alternative measures such as the Hookpod, which represents a single solution (i.e. not a combination of three measures) to seabird bycatch. As of May 2016, the Hookpod has been included in ACAP Best Practice recommendations, in part due to ATF data, and this paves the way for the ATF to advocate for this measure in the pelagic longline fishery.

New horizons

While we have achieved a great deal as the programme has matured, we have also discovered new challenges that need addressing. Our experience in the ATF and wider BirdLife Marine Programme has uncovered information about other fisheries that have a potential impact on seabirds, particularly albatrosses. These include:

- Brazilian demersal longline fleet
- Brazilian Itaipava pelagic longline fleet
- Uruguayan trawl fleet
- Uruguayan demersal longline fleet
- Argentinean fresh fish, side-haul trawl fleet
- New Zealand pelagic longline fleet
- Argentinean and Chilean mid-water trawl fleet

Agreement on the Conservation of Albatrosses and Petrels

Since 2008/09, the ATF has played a critical role in providing robust scientific evidence on two issues that are fundamental to the functioning of the ACAP Seabird Bycatch Working Group:

1. The level of seabird bycatch in our target fisheries. In several cases the only bycatch data provided by ACAP parties has been collected by ATF teams;
2. The at-sea experimentation conducted by the ATF on existing (and emerging) mitigation measures has been highly influential in the development of ACAPs Best Practice Mitigation Advice. The significance of this contribution was recognised in a statement of appreciation by the ACAP Secretariat in 2012 (see attached). This advice has directly influenced the formation and adoption of Conservation Measures to reduce seabird bycatch in Regional Fisheries Management Organisations (RFMOs) (see below).

High seas fisheries

From the outset of the ATF we have always recognized the importance of creating close links with the BirdLife International Regional Fisheries Management Organisation (RFMO) policy team. It has taken us several years to get to the point where the experiences and outputs of the ATF could support the RFMO team to produce tangible results, but in the last few years we have reached that point. One good example is the RFMO engagement with the Korean pelagic longline fleet; in 2013, an ATF instructor conducted a three-month at-sea trip on a Korean high-seas longliner to demonstrate the use of a new, safer (sliding lead) line weighting (which was developed and tested in collaboration with the ATF). This demonstration resulted in the Korean fleet becoming the first Asian fishing fleet to meet line weighting requirements on the high seas. The ATF is also working to support the RFMO team with the Spanish and Taiwanese fleets.

ATF in developed countries

One of the key objectives of the ATF was to provide resources to reduce seabird bycatch in developing countries (many of which are the world's worst bycatch 'hotspots') where without RSPB/BirdLife intervention, there was simply a lack of political will and/or resources to address the problem. In recent years, there has been considerable interest to expand the ATF model into developed countries. This has already occurred in Europe, where we have established a European Seabird Task Force. This project has an initial focus on the cod gillnet fleet in Lithuania and the demersal longline fleet in Catalonia, Spain where the vulnerable species are seaducks and shearwaters respectively. Additional experimental mitigation projects are underway in Poland and Portugal. A big challenge for the team is the Gran Sol (North Atlantic) demersal longline fishery, which was identified in a global review of longline bycatch published by the RSPB³ as having the highest seabird bycatch rate (predominantly of shearwaters) in the world. We have also recruited a Seabird Bycatch Liaison Officer in New Zealand. They will work in recreational fisheries that have been identified as potentially causing significant bycatch of Parkinsons (black) petrels which is the most threatened species in New Zealand waters based on a bycatch risk assessment.

Small-scale fisheries

As discussed, when the ATF was established, we had a clear objective to focus on reducing bycatch in industrial (large vessel) fleets. However, in recent years the level of seabird bycatch in small-scale fisheries has become more widely understood as a potentially serious conservation threat. For example, the recent RSPB led gillnet review on global seabird bycatch levels⁴ and the National Fisheries and Wildlife Foundation (NFWF) funded project to investigate bycatch of pink-footed shearwater in gillnet and purse seine fisheries in the Humboldt Current, suggest that a low level of bycatch across such fleets, which can number several thousand small vessels, has the potential to

³ Anderson, O. R., Small, C. J., Croxall, J. P., Dunn, E. K., Sullivan, B. J., Yates, O., & Black, A. 2011. Global seabird bycatch in longline fisheries. *Endangered Species Research*, 14(2): 91-106.

⁴ Żydelis, R., Small, C. and French, G. 2013. The incidental catch of seabirds in gillnet fisheries: A global review. *Biological Conservation*, 162: 76-88.

present a serious threat to vulnerable seabirds, particularly plunge and forage diving species (e.g. sea ducks, shearwaters, cormorants and alcids).

There are some promising developments through the gillnet work led by Rory Crawford (RSPB), and the purse seine trials funded by NFWF in the Humboldt Current region. However, we are a long way from having a suite of dependable, practicable measures that can be supported by sound science to recommend their widespread adoption. Additionally, the structure, diversity and dynamic characteristics of the small-scale fleets represent a logistical and methodological set of challenges that require considerable learning and planning. There are also complex multiple taxa bycatch issues (e.g. marine turtles and cetaceans) that we must take into consideration when working in gillnet fisheries, making this gear type a complex challenge to address. However, we are confident that the experience we have gained over the last decade in industrial fleets will help us deal with the technical and political issues we need to tackle to make progress in these small-scale fisheries.

Marine Champions

Over the next five years, the ATF will focus developing the long-term legacy of the programme. Through continuing to support in-country capacity, we plan to deliver the technical and political input required to drive sustainable bycatch reductions.

To achieve this, the role of ATF instructors will need to evolve; a process that is already well underway. Many of the instructors have already gained considerable experience working as advocates for regulatory change to support the implementation of mitigation measures proven by the ATF to be effective and efficient, and this changing role will be a focus of our work in the coming years.

Over the coming years, the role and duties of instructors will include:

- Completion of lobbying to ensure that mitigation measures are included in the review of NPOA-Seabirds (and other appropriate legislation) for target fisheries;
- Ensure the sustainable adoption of mitigation measures on vessels from target fleets, including the development of a feedback and reporting system in each case;
- Capacity building for national observer programmes to monitor seabird bycatch levels and compliance with existing mitigation measures;
- Evaluate new industrial fisheries, and prescribe mitigation measures where a seabird bycatch problem exists.

CONCLUSIONS

The Albatross Task Force has been highly successful in the experimental testing and development of mitigation measures for industrial fisheries. Fleet-wide reductions in seabird bycatch have been

achieved where governments have supported the adoption of regulations, and the remaining priority fleets are close to achieving this milestone.

Additional target fisheries in existing ATF countries require urgent attention, particularly mid-water trawl fleets where anecdotal evidence suggests significant levels of seabird bycatch exist.

The ATF is also playing an important role in supporting several wider BirdLife Marine Programme activities, which include:

- Providing practical advice and knowledge transfer to support advocacy in the RFMOs;
- Exporting the ATF model to developed countries;
- Developing an effective approach to reduce seabird bycatch in small scale fisheries.

As we achieve our target bycatch reductions in our original and new target fisheries, the role of ATF instructors will evolve toward working as in-country Marine Champions, to deliver the technical and political input required to maintain sustainable bycatch reductions in each country, and to build the marine capacity of the BirdLife Partnership as a whole.

Back cover: Albatross around a trawl vessel, Argentina
Nahuel Chavez

