DISTRIBUTION OF ALBATROSSES AND PETRELS IN THE ATLANTIC OCEAN AND OVERLAP WITH ICCAT LONGLINE FISHERIES

BirdLife International[1]

SUMMARY

Data from the Global Procellariiform Satellite Tracking Database show that the ICCAT area includes 17% of the global distribution of breeding albatrosses, highlighting the importance of the ICCAT area for the conservation of these species. Albatross and petrel distribution in the Atlantic is concentrated below 30ºS, though this extends northward near the coasts of Brazil and South Africa. This area overlaps with approximately 10% of ICCAT's total longline fishing effort, amounting to 30-40 million hooks per year, with Taiwanese vessels being the main fleet in the area, followed by Japan. Seabird by-catch data are not yet available from these two principal fleets in high seas areas. However, the new availability of data on albatross and petrel distribution and the availability of by-catch rates from a number of other States presents an opportune moment for a meeting of ICCAT member seabird experts to share information and to make an assessment of the impact of seabird by-catch resulting from ICCAT fisheries in the convention area. This type of report was requested by ICCAT in the 2002 Resolution on Seabirds 02-14.

RÉSUMÉ

Les données de la Base de données mondiale de suivi par satellite des procellariiformes montrent que la zone relevant de l'ICCAT inclut 17% de la répartition mondiale des zones de nourricerie d'albatros, soulignant ainsi l'importance de la zone ICCAT pour la conservation de ces espèces. La répartition des albatros et des pétrels dans l'Atlantique se concentre en dessous de 30º S bien qu'elle s'étende vers le nord, près des côtes brésiliennes et sud-africaines. Cette zone chevauche celle où se déroule environ 10% de l'effort de pêche à la palangre total de l'ICCAT (soit 30-40 millions d'hameçons par an) et où prédominent les navires de la flottille du Taïpei chinois suivis de ceux de la flottille japonaise. Les données sur les prises accessoires d'oiseaux de mer ne sont pas encore communiquées par ces deux principales flottilles dans les zones de haute mer. Toutefois, les nouvelles données disponibles sur la répartition de l'albatros et du pétrel et les taux de prises accessoires disponibles émanant de plusieurs autres états représentent le moment opportun pour tenir une réunion des experts en oiseaux de mer des membres de l'ICCAT afin de partager les informations et de réaliser une évaluation de l'impact des prises accessoires d'oiseaux de mer des pêcheries de l'ICCAT dans la zone de la Convention. La Résolution sur les oiseaux de mer de 2002 de l'ICCAT [Rés. 02-14] requiert ce type de soumission de données.

RESUMEN

Los datos de la base de datos global de localización por satélite de Procellariiform muestran que la zona de ICCAT incluye un 17% de la distribución global de crías de albatros, destacando la importancia de la zona de ICCAT para la conservación de esta especie. La distribución de los albatros y petreles en el Atlántico se concentra por debajo de 30ºS, aunque esta distribución se amplía hacia el norte cerca de las costas de Brasil y Sudáfrica. Esta zona coincide aproximadamente en un 10% con el esfuerzo pesquero de palangre total de ICCAT, que asciende a 30-40 millones de anzuelos por año, y los buques de Taipei Chino son la principal flota de la zona, seguidos por los japoneses. No se dispone todavía de datos de captura fortuita de aves marinas de estas dos flotas principales en zonas de alta mar. Sin embargo, la nueva disponibilidad de datos sobre la distribución de los albatros y petreles y la disponibilidad de tasas de captura fortuita de otros Estados hacen que sea el momento oportuno para que se celebre una reunión de expertos en aves marinas de miembros de ICCAT para compartir información y realizar una evaluación del impacto de la captura fortuita de aves marinas realizada por las pesquerías de ICCAT en la zona del Convenio. La Resolución de ICCAT sobre aves marinas de 2002 [Res. 02-14]requiere que se presente este tipo de información.

KEYWORDS
By-catch, Seabirds, Geographical distribution, Spatial variation, Longlining

[1] BirdLife International Global Seabird Programme, RSPB, The Lodge, Sandy, Bedfordshire, SG19 2DL, UK. cleo.small@rspb.org.uk.

1 Introduction

Seabirds are becoming increasingly threatened faster than any other group of birds, largely due to increasing threats to albatross and petrel populations. Nineteen of the 21 species of albatross are now under global threat of extinction (IUCN 2004; BirdLife International 2004a).

One of the principle threats to albatross and petrel species is being caught as bycatch in pelagic and demersal longline fisheries (Brothers, 1991; Gales, 1993; Weimerskirch *et al*, 1997). Albatross and petrel populations are long-lived and have slow reproductive rates, making them highly vulnerable to this mortality. While relatively few birds may be killed by any individual fishing vessel, the scale of longline fishing effort is such that longline mortality is the main factor responsible for the observed decreases in many albatross species.

In total, the South Atlantic is home to around 35% of the total global number of breeding pairs of albatrosses (**Table 1**). Seven species of albatross breed in the region, including four listed by IUCN as Endangered, and two listed as Vulnerable. In addition, the Atlantic is used by albatrosses migrating from other regions (e.g. Northern and Southern Royal albatrosses *Diomedea sanfordi* and *D. epomophora*, and Shy albatross *Thalassarche cauta* from Australia and New Zealand). Threatened petrel species include the Spectacled petrel, White-chinned petrel and both species of giant-petrel.

A key step to assessing the impact of ICCAT longline fisheries on albatross and petrel populations is to analyse the distribution of albatross and petrel populations and the extent of spatial and temporal overlap with ICCAT longline fishing effort in order to indicate areas and periods where there is high risk of seabird bycatch. This paper presents results from analysis of data from the Global *Procellariiform* Tracking Database.

2 Methods

2.1 Albatross satellite tracking data

The Global *Procellariiform* Tracking Database, coordinated by BirdLife International, is the result of a global collaboration between scientists from around the world to assemble and analyse over 90% of the world's remote-tracking data of albatrosses and petrels (BirdLife International, 2004b).

For the South Atlantic, remote-tracking distribution data during the breeding season were available for 5 of the 7 albatross species breeding within the area[2], as well as Northern and Southern giant-petrels and White-chinned petrel. Distribution data during the non-breeding season were available for Black-browed, Grey-headed, Wandering and Northern Royal albatrosses.

Methods used for validating and processing the data are given in *Tracking Ocean Wanderers* (BirdLife International, 2004b). Tracking data for each species were converted into density distributions using the kernel function in ArcGIS 8.2, and these density distributions were standardised to allow addition across species to create multi-species maps. Population sizes of albatross species vary greatly: there are nearly 500,000 pairs of Black-browed albatrosses breeding in the Atlantic, whereas the global population of Tristan albatross amounts to less than 1000 breeding pairs (**Table 1**). For this reason, the multi-species maps were calculated with all species weighted equally, to avoid domination of the maps by the few species with large populations.

2.2 Overlap with ICCAT longline fishing effort

Longline fishing effort data was extracted from ICCAT public domain databases available at www.iccat.es. Fishing effort data (number of hooks) within the Southern Hemisphere (Quadrants 2 and 3) were summarised by year and 5-degree grid square. Fishing effort distribution was also summarised for the 1998-2002 period to represent average effort distribution in the most recent 5-year period for which effort data were available.

[2] Breeding data are currently being collected for the remaining two species of albatross: the Atlantic yellow-nosed albatross and the Sooty albatross (Source: Richard Cuthbert, RSPB, personal communication).

3 Results

3.1 Albatross and petrel distribution

Analysis of the albatross and giant-petrel remote-tracking data highlights the concentration of distribution across the world's oceans between 30-50° South, as well as the North Pacific and the west coast of South America (**Figure 1**). The ICCAT area includes 17% of the global breeding distribution of albatrosses (**Table 2**).

Distribution of albatrosses across the South Atlantic is shown in **Figure 2** and summarised in **Table 3**, which indicates the global importance of the ICCAT area for Black-browed, Grey-headed and Tristan albatross populations, as well as both species of giant-petrel and White-chinned petrels. Remote tracking data for Atlantic Yellow-nosed albatross, Sooty albatross and Spectacled petrel are not yet available, though for all three species a high proportion of the global population breeds on sites in the Atlantic (**Table 1**), indicating that % at-sea distribution in the Atlantic will be high.

Even while breeding, many albatrosses make vast trips across the oceans to forage food for their chicks. For example, while Black-browed albatrosses spend a large proportion of their time feeding in coastal shelf areas (only 6% of their time is in high seas areas) Tristan, Wandering and Grey-headed albatrosses spend over 50% of their time in high seas areas (**Table 4**).

Non-breeding birds and juveniles are less tied to proximity to breeding colonies compared to breeding birds, and may travel more widely. Fewer data currently exist on the distribution of non-breeding albatrosses and giant-petrels. However, **Figure 3** indicates the distribution of non-breeding Black-browed, Grey-headed and Northern Royal albatrosses based on existing data. While non-breeding Grey-headed albatrosses are distributed largely below 40ºS, making circumpolar journeys during the non-breeding period, and Northern Royals from New Zealand and Black-browed albatrosses from the Falkland Islands (Malvinas) are also concentrated below 40°S, non-breeding Black-browed albatrosses from South Georgia disperse northwards, up to 20ºS.

3.2 Overlap with ICCAT pelagic longline fisheries

Data from the ICCAT databases indicate that ICCAT pelagic longline fishing effort below 30ºS has amounted to around 30-40 million hooks in recent years (**Figure 4**), 99% of which has been between 30-45ºS. This represents approximately 10% of ICCAT's current longline fishing effort. Taiwan has the greatest longline fishing effort in the area, followed by Japan. Target fish are principally albacore, with also swordfish and bigeye tuna being caught.

While albatross and petrel distribution is generally below 30ºS, distribution extends further north near the coasts of Brazil and South Africa. Annual longline fishing effort in these coastal areas (up to 20ºS on the Brazilian coast, between 40-50ºW, and on the South African coast up to 20ºS between 0 to 20ºE and up to 10ºS between 10-20ºE) amounts to approximately 14 million hooks per year, which would take the overall longline fishing effort in areas of overlap with albatross distribution, to 45-55 million hooks per year.

Figure 5 indicates variations in pelagic fishing effort throughout the year compared to overall albatross breeding distribution. Overlap with albatross distribution is greatest in the 2nd & 3rd quarter of each year. These periods correspond to 56% and 23% annual longline fishing effort below 30ºS, respectively, between 1998-2002. This also coincides with the periods of greatest densities of non-breeding albatrosses within the area (note that these are not shown in **Figure 5**).

4 Discussion

4.1 Distribution of albatrosses and petrels and overlap with ICCAT longline fishing effort

Remote-tracking data indicate the global importance of the South Atlantic for threatened albatross and petrel distributions. No remote-tracking data are yet available for Atlantic Yellow-nosed and Sooty albatrosses, or the Critically Endangered Spectacled petrel, though all three species breed on the Tristan Island group (37 to 40ºS) in the Atlantic, representing 100%, 59% and 100% of global breeding population, respectively (BirdLife International, 2004b). Available data suggests that these species are probably mostly distributed between 30-40ºS (BirdLife International, 2004a; Tickell 2000), where there is likely to be significant overlap with pelagic longline tuna fisheries. Atlantic Yellow-nosed albatrosses have been recorded up to 10ºS off the west coast of Africa, and between 20-25ºS off Brazil (Neves *et al* 2003; Tickell,2000).

Over 99% of the ICCAT longline fishing effort south of 30ºS takes place between 30-45ºS. This is likely to have particularly high overlap with the distribution of albatrosses and petrels breeding at the Tristan de Cunha Islands, and with the non-breeding and juvenile albatrosses and petrels from all sites in the Atlantic, and some from New Zealand.

4.2 Links between seabird population trends in the Southern Atlantic Ocean and bycatch in pelagic longline fisheries

Long term data on population trends are available for a number of albatross populations within the Atlantic. At South Georgia, Wandering, Black-browed and Grey-headed albatross populations are declining at a rate of 2-4% every year (Croxall *et al*, 1998; British Antarctic Survey unpublished data). In the Falklands, the Black-browed population declined by 18% between 1995 and 2000 (Woods *et al.* 2005), and on Tristan de Cunha, the Tristan albatross population is declining at a rate of 3-5% per year (Cuthbert *et al*, 2005). Population models on data from South Georgia and Tristan de Cunha have provided evidence for the impact of bycatch on albatross declines (e.g. Croxall *et al*.1990; Cuthbert *et al*. 2005; Tuck *et al*, 2004; Weimerskirch *et al* 1997).

Data on seabird bycatch rates are lacking from some of the principal ICCAT pelagic longline fishing fleets which fish below 30ºS, notably from Taiwanese and Japanese vessels fishing in high seas areas, and these represent key knowledge gaps. However, seabird bycatch data are available from South Africa, Uruguay and Brazil, as indicated in **Table 5** (not an exhaustive list). Some bycatch data are also available from Japan from vessels fishing for Southern Bluefin Tuna, for consideration by the Commission for the Conservation of Southern Bluefin Tuna (CCSBT). The data already indicate that seabird bycatch is occurring at high levels within the region, though there is also a high level of variability in reported rates. The data indicate higher bycatch rates in winter (Vaske 1991; Kiyota & Takeuchi 2004; Projeto Albatroz pers comm), and higher catch rates of females and juvenile birds (e.g. Neves & Olmos 1998; Soto *et al* 2003). A spatial and temporal analysis of the combined set of bycatch data, compared to spatial and temporal albatross and petrel distribution data from the BirdLife tracking database, may provide valuable insights into patterns of variability in bycatch rates, as well as a better understanding of the stochastic nature of such events.

Seabird bycatch mitigation measures have been developed for use in pelagic longline fisheries, which can be highly successful in reducing rates of seabird bycatch. Available data on the effectiveness of seabird bycatch mitigation measures in the South Atlantic include data from Brazil, South Africa and Japan. The data show that the combination of tori lines (properly deployed) and blue dyed baits can significantly reduce seabird bycatch (Kiyota & Takeuchi 2004; Neves *et al*. 2003). Similarly, within the Taiwanese fleet, a survey of log book data of 33 longline vessels in the Atlantic and Indian oceans in 2000 indicated that tori lines reduced the seabird bycatch rate by about 75% (Hsia, 2002).

4.3 Role of ICCAT

As for highly migratory fish stocks, albatrosses travel vast distances across the oceans, and consequently their protection depends on collaboration between States. Agreements such as the UN Fish Stocks Agreement and the FAO Code of Conduct for Responsible Fisheries have recognised that Regional Fisheries Management Organisations (RFMOs) have a central role to play in the conservation of vulnerable bycatch species such as albatrosses and petrels. CCAMLR has demonstrated the scale of achievement that is possible through action by an RFMO, having reduced albatross and petrel bycatch in its regulated fisheries by over 99%. The use of seabird bycatch mitigation measures within the ICCAT pelagic longline fisheries which overlap with albatross and petrel distribution would be highly likely to bring significant benefits to the conservation of these vulnerable species.

In 2002, ICCAT passed its Resolution on Seabirds 02-14, in which the Commission requested that, when feasible and appropriate, the Scientific Committee produce an assessment of the impact of ICCAT fisheries on seabird populations. The new availability of data on albatross and petrel distribution and on rates of seabirds bycatch within pelagic longline fisheries in the South Atlantic, makes it very timely to produce such a report

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References

BIRDLIFE INTERNATIONAL. 2004a. Threatened birds of the World 2004. CD-ROM. Cambridge, UK: BirdLife International.

BIRDLIFE INTERNATIONAL. 2004b. Tracking Ocean Wanderers: the global distribution of albatrosses and petrels. Results from the Global Procellariiform Tracking Workshop, 1-5 September 2003, Gordon's Bay, South Africa. Cambridge, UK, BirdLife International.

BROTHERS, N. 1991. Albatross mortality and associated bait loss in the Japanese longline fishery in the Southern Ocean. Biological Conservation 55: 255-268.

CROXALL, J.P., P.A. Prince, P. Rothery and A.G. Wood. 1998. Population changes in albatrosses at South Georgia. In: G. Robertson and R. Gales (Eds.), Albatross biology and conservation. Surrey Beatty and Sons, Chipping Norton, pp. 69-83.

CROXALL, J.P., P. Rothery, S.P.C. Pickering and P.A. Prince. 1990. Reproductive performance, recruitment and survival of Wandering Albatrosses *Diomedea exulans* at Bird Island, South Georgia. Journal of Animal Ecology 59: 775-796.

CUTHBERT, R.J., G.M. Hilton, P.G. Ryan and G. Tuck. 2005. At-sea distribution of the Tristan Albatross *Diomedea dabbenena* and the relationship with pelagic longline fishing in the South Atlantic Ocean. *Biological Conservation* 121; 345-355.

GALES, R. 1993. Cooperative mechanisms for the conservation of the albatross. Australian Nature Conservation Agency Review. Tasmanian Government Printer, Hobart.

GLASS, N., I. Lavarello, J.P. Glass and P.G. Ryan. 2000. Longline fishing at Tristan da Cunha: impacts on seabirds. *Atlantic Seabirds* 2(2): 49-56.

HSIA T.F. 2002. Tackling of bycatch of sea turtles and seabirds by Taiwan longline fishery. Report submitted to the Second International Fishers' Forum on solving the incidental bycatch of seabirds and turtles in longline fisheries. Honolulu, Hawaii, 19-22 November 2002.

IUCN, 2004. IUCN 2004 List of Threatened Species. A global species assessment. Available at http://www.redlist.org.

KIYOTA, M. and Y. Takeuchi. 2004. Estimation of incidental take of seabirds in the Japanese Southern Bluefin Tuna longline fishery in 2001-2002. Paper CCSBT-ERS/0402/Info02, produced for the meeting of the Ecologically Related Species Working Group of the Commission for the Conservation of Southern Bluefin Tuna, 2-5 February 2004, Wellington, New Zealand.

MINAMI, H. and M. Kiyota. 2004. Effect of blue-dyed bait and tori-pole streamer on reduction of incidental take of seabirds in the Japanese Southern Bluefin Tuna longline fisheries. Paper CCSBT-ERS/0402/08, produced for the meeting of the Ecologically Related Species Working Group of the Commission for the Conservation of Southern Bluefin Tuna, 2-5 February 2004, Wellington, New Zealand.

NEVES, T. and F. Olmos. 1998. Albatross mortality in fisheries off the coast of Brazil. In: G. Robertson and R. Gales (Eds). Albatross biology and conservation. Surrey Beatty & Sons, Chipping Norton, UK. pp. 214-219.

NEVES, T., F. Olmos, and F. Pepes. 2003. Plano de Ação Nacional para Conservação de Albatrozes e Petréis (Brazilian National Plan of Action for the Conservation of Albatrosses and Petrels). Preliminary version for discussion. Available at www.projetoalbatroz.com.br.

RYAN, P.G., D.G. Keith and M. Koese. 2002. Seabird bycatch by tuna longline fisheries off southern Africa, 1998-2000. South African Journal of Marine Science 24: 103-110.

SOTO, J.M.R., F.I. Colabuono and A. Filippini. 2003. Análise des capturas de albatrozes e petréis (Procellariiformes) no espinhel peágico operante ne costa sul do Brasil e ao largo, utilizando medidas mitigadoras. In: Congresso Brasileiro de Ornitologia, 2003, Peira de Santana. Estadual de Feira de Santana, 2003

STAGI, A. 2001. Uruguayan longline fisheries. In: S.J. Baird (Ed), Report on the International Fishers' Forum on Solving the Incidental Captures of Seabirds in Longline Fisheries. Auckland, New Zealand, 6-9 November, 20000. Department of Conservation, Wellington, New Zealand, pp.14-15.

STAGI, A., R. Vaz-Ferreira, Y. Marin, and L. Joseph. 1998. The conservation of albatrosses in Uruguayan waters. In: G. Robertson and R. Gales (Eds). Albatross biology and conservation. Surrey Beatty & Sons, Chipping Norton, UK. pp. 220-224.

TICKELL, W.L.N. 2000. Albatrosses. Pica Press, Sussex, UK.

TUCK, G.N., T. Polachek, J.P. Croxall, H. Weimerskirch, P. Ryan, D. Nel, S. Wayte and C. Bulman. 2004. Modelling the impact of fishery incidental mortality on three populations of wandering albatross. In G. Tuck. A comprehensive study of the ecological impacts of the worldwide pelagic longline industry: Southern Hemisphere studies. Hobart, CSIRO Marine Research, 149-224.

VASKE, T. 1991. Seabird mortality on longline fishing for tuna in southern Brazil. Ciencia & Cultura 43: 388-390.

WEIMERSKIRCH, H., N. Brothers and P. Jouventin. 1997. Population dynamics of Wandering Albatross *Diomedea exulans* and Amsterdam Albatross *D. amsterdamensis* in the Indian Ocean and their relationships with long-line fisheries: conservation implications. Biological Conservation 79: 257-270.

WOODS, R., J. Stevenson, R. Ingham, N. Huin, A. Clausen and A. Brown. 2005. Important Bird Areas in the Falkland Islands. In UK Overseas Territory IBA Directory, RSPB, UK.

Table 1. Size and status of albatross and selected petrel populations breeding on sites within the Atlantic. Status: EN=Endangered, VU=Vulnerable, NT=Near-Threatened (IUCN, 2004; BirdLife International, 2004a).

Species	Status	Breeding sites in Atlantic[3]	Annual breeding pairs in Atlantic	Percent of total global breeding pairs
Albatrosses				
Atlantic yellow-nosed albatross *Thalassarche chlororhynchos*	EN	Tristan Islands	33,250	100%
Black browed albatross *Thalassarche melanophrys*	EN	Falkland Islands (Malvinas), South Georgia	484,038	79%
Grey-headed albatross *Thalassarche chrysostoma*	EN	South Georgia	61,582	58%
Light-mantled albatross *Phoebetria palpebrata*	NT[4]	South Georgia	6,250	28%
Sooty albatross *Phoebetria fusca*	VU	Tristan Islands	7,747	59%
Tristan albatross *Diomedea dabbenena*	EN	Tristan Islands	801	100%
Wandering albatross *Diomedea exulans*	VU	South Georgia	2,001	25%
Giant-petrels and petrels				
Spectacled petrel *Procellaria conspicillata*	CR	Tristan Islands	3-4,000	100%
White-chinned petrel *Procellaria aequinoctialis*	VU	Falkland Islands (Malvinas), South Georgia	>2,000,000	? (>50%)
Northern Giant-petrel *Macronectes halli*	NT	South Georgia	4,310	38%
Southern Giant-petrel *Macronectes giganteus*	VU	Falkland Islands (Malvinas), South Georgia	19,810	42%
Total number of albatross pairs breeding in Atlantic per year			595,669	35%

Table 2. Top RFMOs in relation to breeding albatross distribution (% time), and amount of longline fishing effort below 30°S, based on public-domain fishing effort data published by RFMOs.

RFMO	Area	Breeding albatross distribution: species weighted equally (%)	Longline fishing effort below 30°S
CCSBT	30-50º S	67 %	120-130 million hooks
WCPFC	West & Central Pacific	46 %	Approx. 100 million hooks[5]
IOTC	Indian	21 %	75-100 million hooks
ICCAT	Atlantic	17 %	30-40 million hooks[6]
CCAMLR	Southern	16 %	100-120 million hooks

[3] Note: The presentation of material in this paper and the geographical designations employed do not imply expression of any opinion on the part of BirdLife International concerning the legal status of any country, territory or area, or concerning the delimitation of its frontiers or boundaries.
[4] Population trends largely unknown (BirdLife International, 2004a).
[5] This includes longline fishing effort in the Western Pacific both below 30ºS and above 20ºN, since, unlike the other RFMOs, the WCPFC area also includes albatross distribution in the Northern Hemisphere
[6] 45-55 million hooks per year if coastal areas are included up to 20ºN near Brazil, and up to 10ºN near South Africa (see text for details).

Table 3. Percentage time at sea spent within the ICCAT area for seven species of albatross and three petrel species breeding in the Atlantic. Status: CR=Critically Endangered, EN=Endangered, VU=Vulnerable, NT=Near-Threatened (IUCN, 2004; BirdLife International, 2004a).

Species	Status	Percent global breeding distribution within ICCAT area
Albatrosses		
Atlantic Yellow-nosed albatross	EN	No data for Atlantic
Black-browed albatross	E	79
Grey-headed albatross	V	64
Light-mantled albatross	NT	(57)[7]
Sooty albatross	E	No data for Atlantic
Tristan albatross	E	100
Wandering albatross	V	26
Giant petrels and petrels		
Northern giant-petrel	NT	92
Southern giant-petrel	V	84
White-chinned petrel	V	93
Spectacled petrel	CR	No data for Atlantic

Table 4. Percentage time at sea within EEZs and high seas areas spent during the breeding season by the seven albatross species which breed in the Atlantic.

Species	EEZs	High Seas	Outside ICCAT
Atlantic Yellow-nosed albatross		*No data*	
Black-browed albatross	87	6	6
Grey-headed albatross	42	52	6
Light-mantled albatross	42	30	28
Sooty albatross		*No data*	
Tristan albatross	44	56	0
Wandering albatross	49	50	2

[7] This total will be lower once there is tracking data available for Light-mantled albatross colonies in the Indian Ocean and Western Pacific Ocean.

Table 5. Seabird bycatch data from pelagic longline fisheries in the South Atlantic (not an exhaustive list)

Bycatch data	Year	Birds/ 1000 hooks
Brazil		
Swordfish longline fishery, Neves & Olmos, 1998	1994 -1995	0.12 (94.4% birds killed during winter)
Projeto Albatroz, unpublished	2002 –2004	0.13
	2000 –2005	0.09
Pelagic tuna, during winter, Vaske, 1991	1987 - 1990	3.82 (range 0.8 to 15)
Pelagic tuna, Soto el al, 2003		0.27 (rates up to 2.18 albatrosses, 3.33 petrels)
Japan		
Real Time Monitoring Programme, SW tip	2001	0.19 (Tori lines)
S.Africa, Kiyota & Takeuchi, 2004	2002	0.31 (Tori lines)
Minami & Kioyota, 2004	2001 -2002	3.0 to 6.0 (No measures)
		0.0 to 5.0 (Blue bait)
		0.75 – 1.5 (Tori lines)
South Africa		
Ryan *et al* 2002	1999	0.77
South Africa National Observer Programme	2000-2003	0.2 (range 0 to 1.16)
Tristan de Cunha		
Glass *et al* 2000		>1
Uruguay		
Stagi, 2001	1998	0.3
Tuna & swordfish, Stagi *et al* 1998	1993 - 1994	10.3

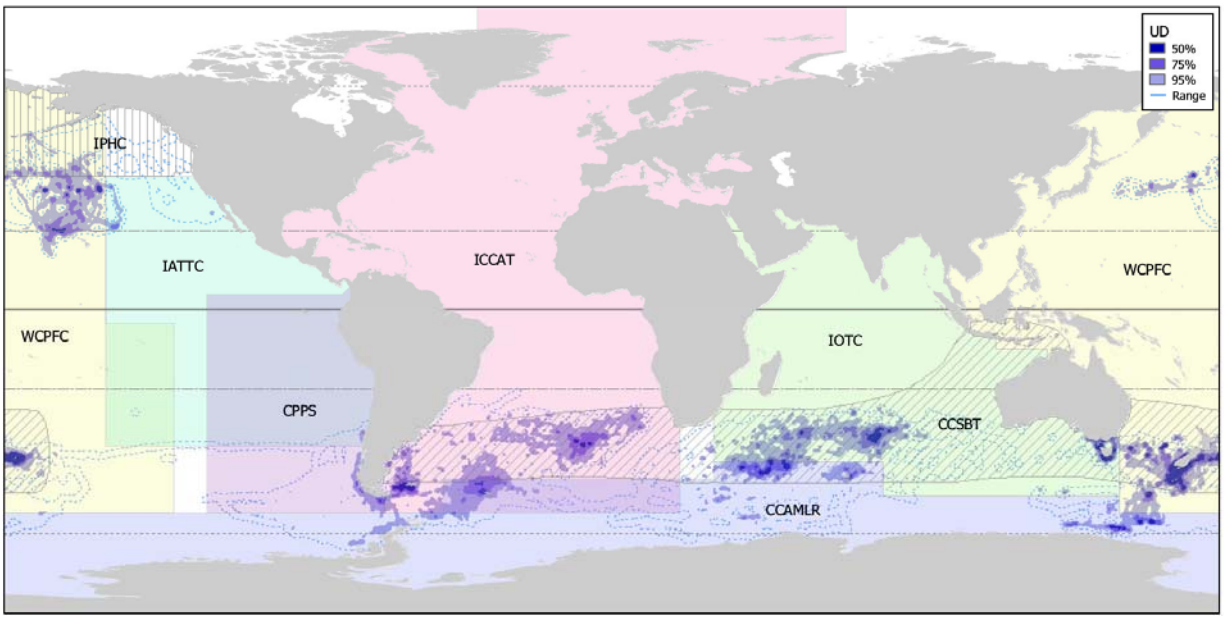

Figure 1. Combined density distribution of breeding albatrosses in relation to the areas managed by selected RFMOs. The composite was created by combining the utility distribution (UD) for each species giving each species equal weighting. A UD provides a probability contour indicating the relative amount of time birds spend within an area i.e. they will spend 75% of their time within the 75% UD. Figure reproduced from *Tracking Ocean Wanderers* (BirdLife, 2004b).

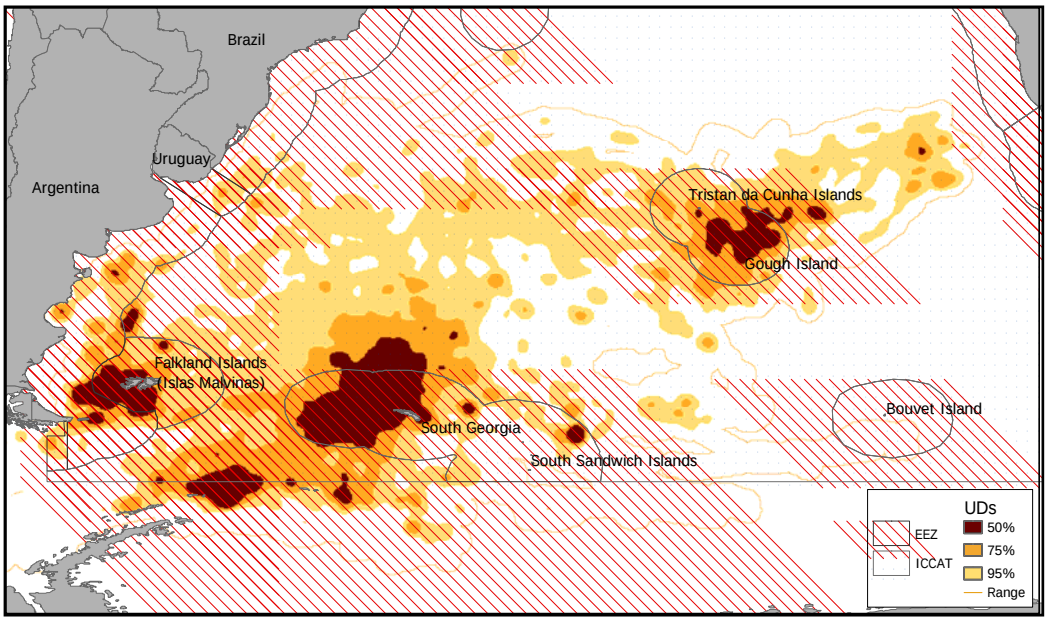

Figure 2. Combined density distribution for five albatross species breeding in the Atlantic Ocean: Black-browed albatrosses from the Falkland Islands/Islas Malvinas and South Georgia; Grey-headed, Light-mantled and Wandering albatrosses from South Georgia; and Tristan albatrosses from Gough Island[8]. Each species has been given equal weighting.

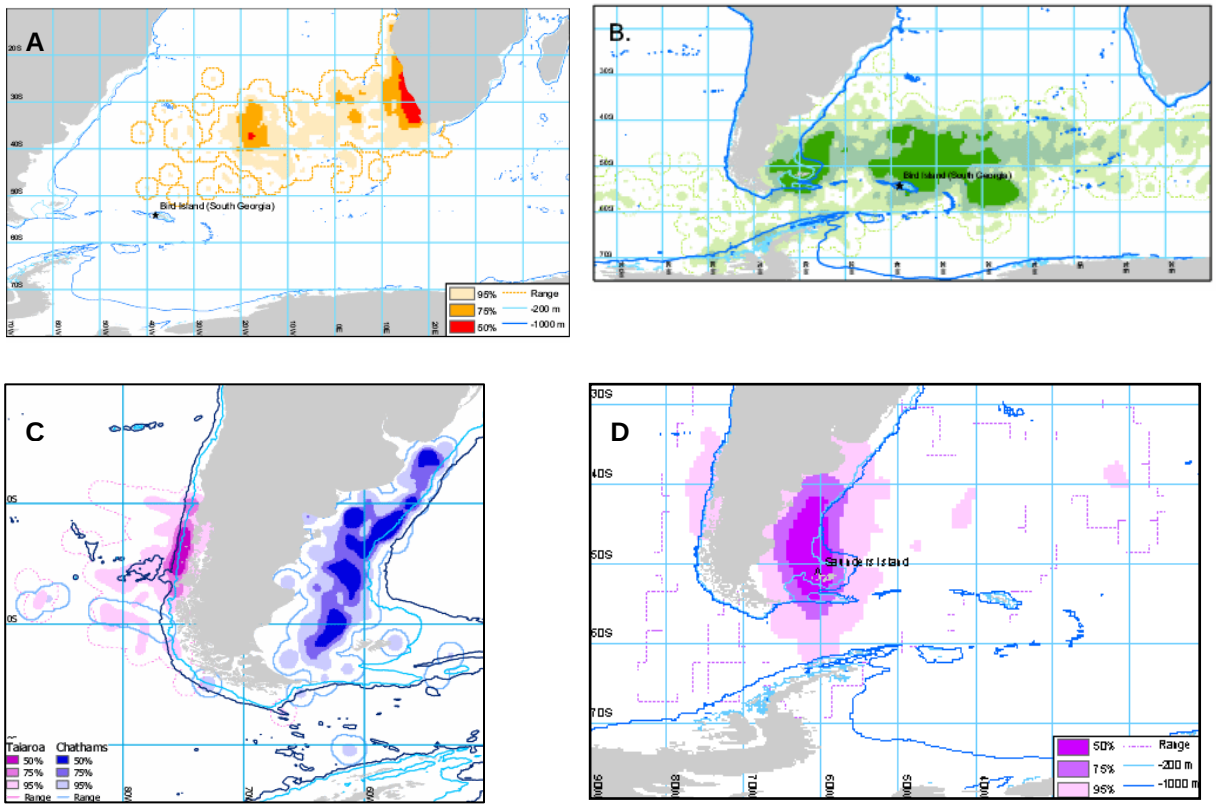

Figure 3. South Atlantic distribution maps for non-breeding Black-browed, Grey-headed and Northern Royal albatrosses: (a) Black-browed albatross, South Georgia (n=4 individuals), (b) Grey-headed albatross, South Georgia (n=6 individuals) (note that B only shows a portion of the non-breeding range, which extends across the Indian, Pacific and Atlantic Oceans), (c) Northern Royal albatross, Chatham Is and Taiaroa Head, New Zealand (n=4 individuals), (d) Black-browed albatross, Falklands Islands (Malvinas) (n=27 individuals).

[8] The presentation of material in this paper and the geographical designations employed do not imply expression of any opinion on the part of BirdLife International concerning the legal status of any country, territory or area. A dispute exists between the Governments of Argentina and the United Kingdom concerning the sovereignty over the Falkland Islands (Malvinas)

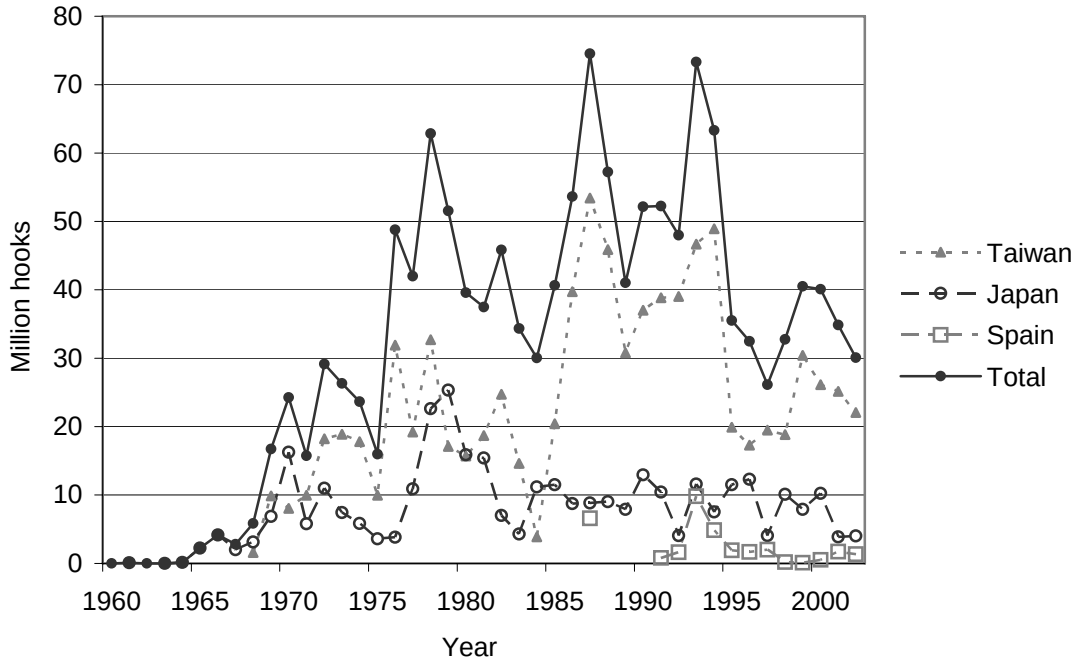

Figure 4. ICCAT longline fishing effort south of 30ºS, by flag.

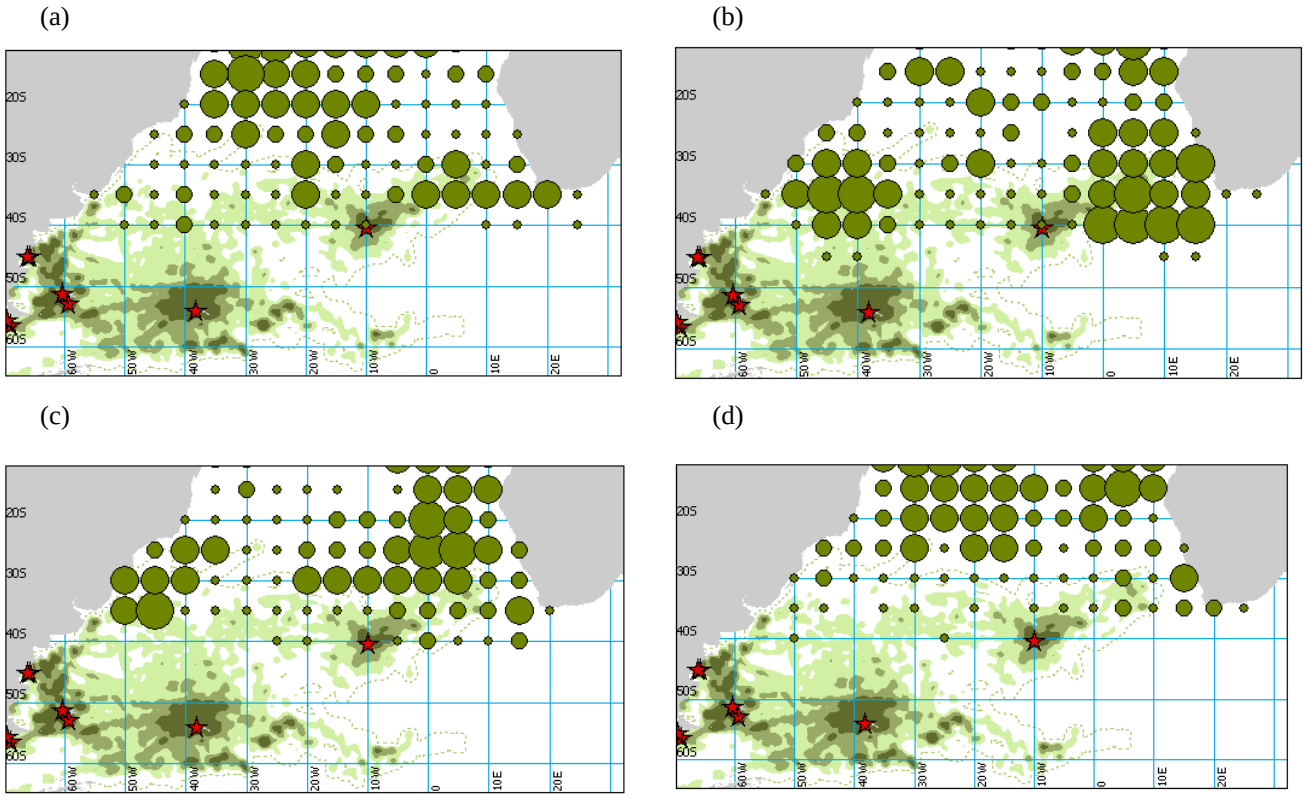

Figure 5. Overlap between distribution of breeding albatrosses in the Southern Atlantic Ocean and ICCAT pelagic longline fishing effort by quarter year, based on average fishing effort (AvgHooks) between 1998-2002. Fishing effort data were extracted from ICCAT database. (a) first quarter (Jan-March), (b) second quarter (April-June), (c) third quarter (July-Sept), (d) fourth quarter (Oct-Dec).