Designing networks of marine protected areas:
exploring the linkages between Important Bird Areas and ecologically or biologically significant marine areas





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Summary

- Important Bird Areas (IBAs) are identified using a globally agreed standardised set of data-driven criteria and thresholds, ensuring that the approach can be used consistently worldwide. In the terrestrial environment more than 10,000 IBAs have been identified, and these have proved to be a useful tool for focusing conservation action.

- IBAs have strong links with a variety of international, regional and national policy mechanisms (including the Convention on Biological Diversity), and in some cases act as a shadow list for potential protected areas.

- Since 2004, IBAs have been identified in the marine environment, and methodologies developed to identify sites in a consistent way both within and beyond territorial waters.

- There is considerable overlap and congruence between the criteria used to identify marine IBAs and those adopted by the CBD[1] to identify ecologically or biologically significant marine areas (EBSAs) in Areas Beyond National Jurisdiction (ABNJ). This is particularly so for criteria relating to vulnerability and irreplaceability.

- EBSAs will need to comprise sites identified as important for a variety of taxa, ranging from species that are sedentary throughout life to those that are highly mobile and pelagic. Seabirds are oceanic top predators that are particularly easy to detect, track and count, and can act as important indicators of wider marine biodiversity and marine ecosystem health.

- Marine IBAs (defined on the basis of seabird data) are likely to be strong candidates for the identification of, or inclusion within, EBSAs. Specifically, quantitative data (especially from remote-tracking studies) on seabird distributions at sea can make important contributions to identifying representative networks of marine protected areas that take account of annual life cycles, life history stages, migration routes and irreplaceability (rarity, global threat).

- Further analysis of seabird tracking and distribution data is needed to define additional IBAs in both Exclusive Economic Zones and international waters, and will be of key importance in defining EBSAs for seabirds in the latter.

[1] COP Decision IX/20 paragraph 14; COP Decision IX/20 Annex I, and COP Decision IX/20 Annex II

CONTENTS

Section 1 of this document deals with the history, concept and aims of the IBA Programme as a whole, while from Section 2 onwards the document focuses on marine IBAs and the links to the CBD EBSA criteria.

SECTION ONE – Important Bird Areas

1.1 Concept and aim

BirdLife International's mission is "to conserve wild birds, their habitats and global biodiversity, by working with people towards sustainability in the use of natural resources" (BirdLife International 2004a). BirdLife's strategy to achieve this mission integrates species, site and habitat conservation with sustaining human needs, and is implemented by the BirdLife Partnership in over 100 countries and territories worldwide. The site-based component of this approach, the Important Bird Area (IBA) Programme, complements other programmes that focus on species and habitats.

Sites are discrete areas of habitat that can be delineated and, at least potentially, managed for conservation. Since biodiversity is not distributed evenly across the globe, the protection of a carefully chosen network of sites can represent a cost-effective and efficient approach to conservation because a relatively small network can support disproportionately large numbers of species. Effective protection of sites can address habitat loss and over-exploitation, two major causes of biodiversity loss. Site conservation can often include a significant degree of human use. Sites are, for these reasons, a major focus of conservation investment by government, donors and civil society. In particular, they form the basis of most protected area networks (BirdLife International 2004b, 2008b).

As well as being an important conservation focus in their own right, birds are, as a group, good indicators. This is because they have well understood distributions and habitat requirements; a greater amount of information is available on the status and distribution of the world's birds than is the case for any other major taxonomic group (BirdLife International 2004b, 2008b). They are, in addition, relatively easy to identify and record in the field and can act as flagships for conservation. Birds can be a highly effective means of setting geographical priorities for conservation in the absence of detailed information on other taxa (Brooks *et al.* 2001, Tushabe *et al.* 2006).

BirdLife's IBA programme therefore aims to identify, document, safeguard, manage and monitor a network of sites of international importance for birds, across the geographical range of those bird species for which a site-based approach is appropriate. Patterns of bird distribution are such that, in most cases, it is possible to select sites that support many species, so that conservation effort and resources can be applied most effectively.

Overall, the IBA programme is a method of identifying the most important places on earth for birds. These sites, the IBAs, can then form the basis for more detailed conservation planning, and the focus for practical advocacy, action and monitoring.

1.2 History and coverage

The Important Bird Area (IBA) programme dates back to the late 1970s when the predecessors of both BirdLife International and Wetlands International were approached by what was then the Commission of the European Community for help with implementation of Article 4 of the European Council Directive 79/409/EEC (the 'Birds Directive'), which requires that "Member States shall classify in particular the most suitable territories in number and size as Special Protection Areas" for those threatened species listed on Annex I of the Directive, as well as other migratory species listed on Annex II.

Further collaborative work between the forerunners of BirdLife International and Wetlands International resulted in the publication in 1989 of a regional inventory of IBAs for the whole of Europe, then comprising 32 countries, the first IBA inventory (Grimmett and Jones 1989). Documenting 2,444 sites, this volume was a major step towards realising a continent-wide bird-conservation strategy and accelerated progress in maintaining and enhancing the conservation value of the sites it identified. Following this success, the IBA programme has been adopted by all BirdLife Partner and Affiliate organisations.

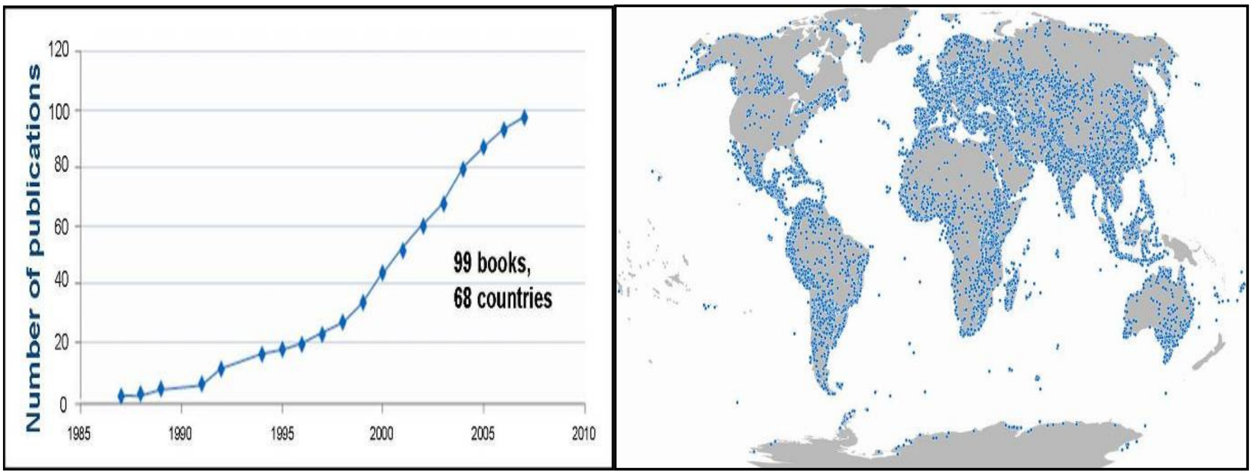


Figure 1: Graph showing the number of National IBA publications 1987–2007 (left) and map showing that over 10,000 IBAs have been identified and documented in 190 countries and territories. In some regions, IBAs have also been selected at the regional and sub-regional levels. The process of identification actively continues in some parts of the world and has yet to begin in others. Note data correct as of August 2008

To date, over 10,000 sites have been identified worldwide (Fig. 1), with work underway in the majority of countries that do not yet have finalised IBA assessments. When complete, the global network of terrestrial IBAs is likely to comprise around 15,000 sites covering some 10 million km^2 (c.7% of the world's land surface), identified on the basis of about 40% of the world's bird species (see below). By mid 2009 some 124 IBA national and regional publications, covering all or part of 190 countries and territories had been produced (Appendix 1 of Langhammer *et al.* 2007 give details of these publications up to that date). All information about IBAs is held in a dedicated module of BirdLife's World Bird Database (WBDB) with summary data provided on the Datazone of www.birdlife.org.

As indicated above, the development of the IBA programme started in response to a political process, namely the European Union Birds Directive, but has subsequently developed strong links with many other international, regional and national agreements. See Annex I for further details. BirdLife has supported governments in making progress towards the targets they have agreed for the designation of sites under these agreements by using the IBA approach to identify candidate sites and promoting their protection and management.

1.3 IBA Criteria

Important Bird Areas (IBAs) are identified using a standardised set of data-driven criteria and thresholds. As such, they ensure that the approach can be used consistently worldwide (Fishpool *et al.* 1998). When originally devised they were intended for application only in Europe as they had to be compatible with European Union legislation (Osieck and Mörzer Bruyns 1981, Grimmett and Jones 1989). Following the success of the approach in Europe, and the subsequent decision to extend the programme worldwide, it was apparent that there were numerous benefits—ease of understanding and usage, comparative analyses, power of justification and advocacy etc.—to adopting a standardised approach. The resulting categories of IBA and the criteria used to select them at the global level are listed in Box 1. The IBA categories and criteria refer to the two essential attributes used to identify priorities for conservation: vulnerability (A1) and irreplaceability (different aspects of which are covered by A2, A3 and A4). More detailed explanation of the criteria, and how they have been applied in different regions, can be found in Heath and Evans (2000), Fishpool and Evans (2001), BirdLife International (2004c), BirdLife International and Conservational International (2005) and BirdLife International (2008a); see also the Datazone of www.birdlife.org.

Box 1: Categories and criteria used to select IBAs at the global level. Sites may qualify for multiple categories and criteria

Category A1 Globally Threatened Species
The site regularly holds significant numbers of a globally threatened species, or other species of global conservation concern.
The sites qualifies if it is known, estimated or thought to hold a population of a species categorized on the IUCN Red List as globally threatened (Critical, Endangered and Vulnerable), Near Threatened or Data Deficient. The list of globally threatened species is maintained and updated annually by BirdLife International.

Category A2 Restricted-range Species
The site is known or thought to hold a significant component of the group of species whose breeding distributions define an Endemic Bird Area (EBA) or Secondary Area (SA).
Endemic Bird Areas are defined as places where two or more species of restricted-range, defined as those whose global breeding distributions are of less than 50,000 km^2, occur together—see Stattersfield *et al.* (1998). A Secondary Area (SA) supports one or more restricted-range species, but does not qualify as an EBA because fewer than two species are entirely confined to it.

Category A3 Biome-restricted Assemblages
The site is known or thought to hold a significant component of the group of species whose distributions are largely or wholly confined to one biome.
Biome-restricted assemblages are groups of species with largely shared distributions which occur mostly or entirely within all or part of a particular biome.

Category A4 Congregations
i) Site known or thought to hold, on a regular basis, ≥ 1% of a biogeographic population of a congregatory waterbird species.
ii) Site known or thought to hold, on a regular basis, ≥ 1% of the global population of a congregatory seabird or terrestrial species.
iii) Site known or thought to hold, on a regular basis, ≥ 20,000 waterbirds or ≥ 10,000 pairs of seabirds of one or more species.
iv) Site known or thought to exceed thresholds set for migratory species at bottleneck sites.

Allied closely to the selection criteria is the issue of IBA boundary delimitation. The guidelines that were developed to accompany the global criteria are shown in Box 2.

Box 2: Guidelines for delimiting IBAs

An IBA is defined and delimited so that, as far as possible, it:

a) is different in character, habitat or ornithological importance from surrounding areas;
b) exists as a Protected Area, with or without buffer zones, or is an area that can be managed in some way for conservation;
c) is an area which provides the requirements of the trigger species (i.e. those for which the site qualifies) while present, alone or in combination with networks of other sites.

Note that (a) may not apply in extensive areas of continuous, relatively uniform habitat, and that this definition may not always be applicable to bottleneck sites for migratory birds. A migratory bottleneck site is one at which, during certain well-defined seasons of the year, large numbers of migratory birds pass through or over. The concentration of birds at these sites at such times is a consequence of both the sites' geographical location and their local topography.

In many cases, deciding where to put the IBA boundary is straightforward, often dictated by obvious habitat boundaries or guided by existing Protected Area boundaries, land ownership or management boundaries, etc. In others, establishing where the edges should be located requires consultation and field work. As each site, and its local context, is unique, there are no fixed rules that be can applied, only guidelines. Similarly, there is no set maximum or minimum size for an IBA—what is biologically sensible has to be balanced against practical considerations of how best the site may be conserved, which is the main priority. Common sense needs to be used in all cases: what is most likely to be effective in conserving the site under prevailing conditions and circumstances, locally and nationally?

In places where there are no obvious breaks in habitat, simple, conspicuous boundaries such as roads or rivers may be used to delimit site edges. Where these are lacking or insufficient, features such as water catchment areas, ridges and hilltops, Protected Area boundaries, contour lines, bathymetric (seabed) features, measures of remoteness from settlements or roads (as indicators of intactness of habitat or lack of disturbance), boundaries of ownership or administration (e.g. legal or ethnic), logging concession data, and geographic occurrence of actual and potential threat, etc can also be used to inform decisions. The habitat requirements of the key species at the IBA should be given the highest consideration when delimiting the site.

1.4 Process of identifying IBAs

The Important Bird Area (IBA) identification process aims to locate, list and document all sites that are known or believed to meet the selection criteria. Ultimately, the IBA process is participatory in nature, and draws upon information collected by networks of ornithologists, birdwatchers and conservationists who have carried out surveys of bird distributions and numbers over past decades. Wherever possible, the BirdLife Partner, Partner Designate, Affiliate or country programme leads nationally in IBA identification. In many cases a national IBA coordinator (or team) is appointed to lead the process and he or she invariably undertakes a detailed survey of the relevant technical literature and a wide consultation when determining a candidate list of sites. The wider consultation may involve one or more national workshops which bring together experts, stakeholders, and indigenous and local communities who together draw-up and debate the draft IBA lists. These workshops also serve to publicize the project, involve, train and enthuse participants, and ensure institutional, local and national buy-in to the results from the beginning. This has the benefit of building ownership of sites, and may help to develop Site Support Groups (SSGs), Local Conservation Groups, and IBA caretakers run by members of local site-adjacent communities that actively promote the conservation of IBAs. SSGs have proved to be one of the most practical ways of achieving conservation and monitoring by local communities. For example, in Africa there are now over 145 SSGs in more than 19 countries, with thousands of members and more groups being formed (BirdLife International 2007).

Although, at the national level, each IBA programme is unique, due to the particular sets of circumstances and issues that apply, the process may helpfully be thought of as comprising four overlapping stages. These are categorized as start-up, identification, action planning and the resultant national site conservation programme. There are numerous elements to each, not all of which are appropriate or possible in every country or territory. The main elements are listed in Box 3.

Box 3: Components of the four stages of an idealised national IBA programme

Start up: consultation, background content assessment, stakeholder analysis and establishment of national partnerships and agreements; setting up a suitable institutional framework involving the cooperation of others including government agencies, development NGOs, universities, etc.; agreeing national objectives.
Identification: the process of identifying potential IBA sites, data collection, field surveys; production of an IBA inventory and population of a database.
Action planning: setting priorities for conservation action and implementing advocacy, activities and monitoring for IBAs.
National site conservation programme: establishing a sustainable management cycle in which a programme of advocacy, action and monitoring for the national IBA network is established, with security of funding.

Each site included in the initial list of potential IBAs usually falls into one of three broad categories: well-worked sites with adequate and up-to-date data, less well known sites with older or poorer quality information and, in some countries, areas for which there is little information but which are known or thought to hold good quality habitat wherein trigger species may be expected to occur. The first of these will probably qualify as IBAs in the absence of any further ornithological data, while the second two represent survey targets. These are gaps that require additional field work to determine whether or not they hold trigger species in such numbers as to warrant proposing as IBAs. Once relevant site data have been collected, the BirdLife Partner organisation or equivalent propose the set of IBAs for the Birdlife Secretariat to check and validate, to ensure that the criteria have been interpreted and applied correctly and that the approach taken is consistent with that adopted elsewhere.

In addition to data on trigger species, much additional information is also gathered. For all sites, key data are collected on location, site characteristics, other (non-trigger) avifauna, habitats, land-uses, threats, protection status, conservation activities, other significant biodiversity and literature sources. The methods used for compiling and classifying this information have been standardized as much as possible.

SECTION 2 - Marine IBAs

2.1 Background – the need for marine IBAs

Although, as indicated above, the identification stage of the Important Bird Area programme is currently approaching ‘completion’ in terrestrial (including inland and coastal wetland) environments, the process is still at an early stage in the marine realm. Extending the IBA programme to the oceans was a logical and significant development but has posed both conceptual and practical challenges. The term “marine IBA” is used here as shorthand for those IBAs that can be regarded as marine in nature because of the seabird populations they contain, but this is not intended to imply that they are fundamentally distinct from other IBAs.

As it did with the IBA programme at its inception, work on the means by which marine IBAs might be identified began in Europe, in response to the recognition in 1999 that the European Union’s Habitats and Birds Directives applied to waters of relevance to the Member States.

As described above, IBAs have formed a significant scientific reference for the designation of Special Protected Areas under the Birds Directive and it was therefore appropriate that the IBA selection criteria should be reviewed and, as necessary, adapted, in order to use them to identify marine IBAs, and guidelines developed for their application.

Osieck (2004) reviewed all relevant work within the European Union up to that date and distinguished four ‘types’ of marine IBAs, shown in Box 4, that included aspects of seabird life-cycles that could be captured by the site selection criteria. This has formed the basis for subsequent studies into how the existing criteria and boundary delimitation guidelines need to be adapted for marine application and to assess the extent to which each type is amenable to site-based conservation. See Annex II for examples of how IBAs of each type can be identified.

Box 4: The four ‘types’ of marine IBA recognised by Osieck (2004) that include the different aspects of seabirds’ at-sea activities

Seaward extensions to breeding colonies
These extensions, which are used for feeding, maintenance behaviours and social interactions, are limited by the foraging range and depth of the species concerned. The breeding colonies themselves will have, in most cases, already been identified as IBAs, which will therefore require their boundaries to be extended into the marine environment. The seaward boundary would, as far as possible, be colony and/or species-specific, based on known or estimated foraging and maintenance information.

Non-breeding (coastal) concentrations
These include sites, usually in coastal areas, which hold feeding and moulting concentrations of waterbirds, such as divers, grebes and benthos feeding ducks. They could also refer to coastal feeding areas for auks, shearwaters etc.

Migratory bottlenecks
These are sites whose geographic position means that seabirds fly over or round in the course of regular migration. These sites are normally determined by topographic features, such as headlands and straits.

Areas for pelagic species
These sites comprise marine areas remote from land at which pelagic seabirds regularly gather in large numbers, whether to feed or for other purposes. These areas usually coincide with specific oceanographic features, such as shelf-breaks, eddies and upwellings, and their biological productivity is invariably high.

2.2 Process of identifying marine IBAs

Experience to date has shown that the identification of marine Important Bird Areas (IBAs) is possible under the existing IBA criteria, but also that the process is often more complex, time-consuming and expensive than in terrestrial environments. However, as a result of experience-sharing across the BirdLife Partnership, guidance has been developed which ensures that marine IBAs are identified and delimited in a manner that is comparable to and consistent with the wider IBA programme.

To ensure that standards are maintained, and that experiences are easily shared, BirdLife has been developing a marine IBA 'toolkit'. This outlines experience to date within the Partnership and covers a variety of techniques useful for identifying marine IBAs, such as: the methods available for extending areas around breeding colonies to include foraging areas, for the collection and analysis of data from both remote sensing and transect surveys, and for habitat modelling. It also highlights important considerations when applying the IBA criteria and delimiting sites in the marine environment, and other aspects.

Broadly, the marine IBA identification process may be broken down into the following seven stages:

1. Data gathering:
    a. Gather available data on seabird distribution (from all sources)
    b. Gather data on environmental variables for the same time periods as the seabird data (e.g. to use for habitat modelling)
    c. Create Geographical Information System (GIS) data layers of these data, on a species by species basis. Environmental variables and seabird distributions at sea should be organised to allow comparisons between different months/seasons. If it is not possible to convert data into a GIS-compatible format, these can still be used as supporting information.

2. Determine which layers should be regarded as primary and which complementary for identification and delineation.

3. Identify likely 'hotspots' for each species, following a general rule which restricts selection to areas where two or more data layers overlap.

4. Apply the IBA criteria and thresholds for each species to these hotspots, to confirm that they merit selection.

5. Delimit proposed boundaries for those hotspots which trigger IBA criteria. Where appropriate, overlap hotspots for different species in the same area and merge them into a single IBA.

6. Produce IBA site description, including details of IBA trigger species, number of birds present, data sources used to identify the site, habitat description etc.

7. Enter data in the BirdLife World Bird Database (WBDB) for subsequent confirmation by the BirdLife Secretariat.

2.3 Work done to date on identifying marine IBAs

In 2007 Birdlife conducted an analysis of the existing IBA datasets to identify the IBAs which may be considered as candidate marine IBAs, on the basis of the seabird species they hold which trigger IBA criteria (Howgate and Lascelles 2007). This study found that across 158 countries and territories worldwide, some 2,106 IBAs have been identified because they hold more than threshold numbers of one or more seabird species.

		Type of marine IBA			
BirdLife Region	**Total marine IBAs**	**1**	**2**	**3**	**4**
Europe	842	638	314	6	10
North America	282	110	51	2	3
Asia	197	75	61	0	0
Africa	176	114	101	1	0
South America	160	105	20	0	1
Caribbean	137	137	8	0	0
Antarctica	101	23	0	0	0
Australasia	81	80	2	0	0
Middle East	81	49	55	0	0
Mexico & C. America	38	25	21	0	0
Oceania	11	11	0	0	0
TOTAL	2106	1367	633	9	14

Table 1: Number of candidate marine IBAs by BirdLife region as of 2008
Types of marine IBA refer to 1 = breeding colonies requiring seaward extensions, 2 = non-breeding (coastal) congregations, 3 = migratory bottlenecks, 4 = areas for pelagic species. Sums of types 1 to 4 may exceed totals in second column since sites may qualify for more than one type.

The study was updated in 2008, and this time attempted to assign each IBA to one or more of the four types of marine IBA recognised by Osieck (2004). This highlighted that over 1,300 sites potentially require boundary revisions to include high-use marine areas close to breeding colonies (Table 1, Figure 2). It also found that a further 600 or so IBAs have been identified for seabirds when on passage and during the non-breeding season, but that fewer than 15 pelagic sites had been identified and delimited.

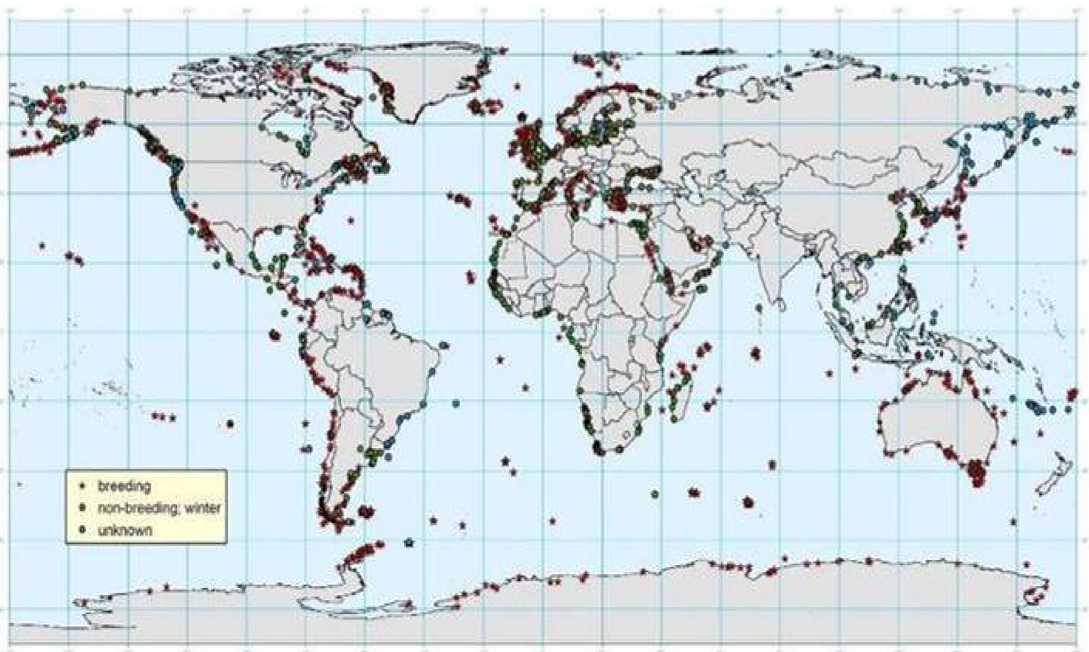


Figure 2: Map of candidate marine IBAs, showing sites qualifying during the breeding and non-breeding seasons. Data correct to August 2008

Many BirdLife Partners are now actively engaged in marine IBA identification in a variety of forms, from tackling the relatively simple task of identifying important seabird breeding colonies and applying seaward extensions to them, to the more complex ones of analysing a variety of information on the at-sea distributions of a wide range of seabirds, in order to identify networks of sites within and beyond EEZs (see Fig. 3).

Much of the best-developed and complete marine IBA work has, to date, been undertaken in Europe. Between 2004 and 2009 Sociedad Española de Ornitología (SEO, BirdLife in Spain) and Sociedade Portuguesa para o Estudo das Aves (SPEA, BirdLife in Portugal) took on two linked projects, with the assistance of European Union LIFE funding, looking to address the identification of marine IBAs within their respective EEZs. The projects used vessel and aerial survey programs, tracking technologies and a variety of analytical tools to determine at-sea distributions. They also trialled and developed new methodological frameworks that could be used for marine IBA identification by other BirdLife Partners in the EU, and point the way for identifying sites worldwide, particularly in the less-studied offshore areas. In 2009 both projects produced exhaustive and detailed inventories of the marine IBAs found both in Spain and Portugal, to guide the establishment of SPAs in these countries under EU legislation. These projects also identified a number of IBAs occurring within other countries' EEZs, as well as sites lying in international waters, the first of their kind. Further details can be found in Annex II.

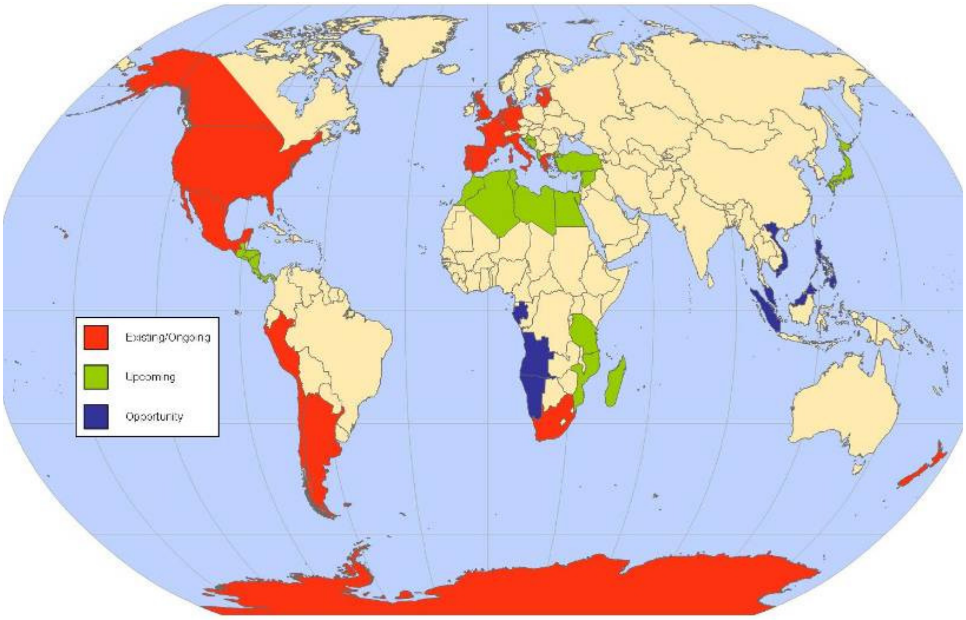


Figure 3: Map showing countries/regions where marine IBA work is currently underway (red), planned for the near future (green), and an opportunity exists to engage with a legal mechanism or convention (blue)

Since 2007 there has also been a great deal of interest from the wider Birdlife Partnership in developing marine IBA work as marine issues have become pressing realities. As a result, a number of other marine IBA initiatives outside Europe have begun to emerge. For example, in North America, a collaborative effort between Birdlife Partners representing coastal states and countries of the Western North American seaboard is seeking to identify and delimit a network of coastal and pelagic IBAs stretching from Barrow, Alaska to Baja, Mexico. Aves Argentinas (BirdLife in Argentina) has reviewed all coastal breeding colonies, and has begun to gather data to identify at-sea sites for seabirds. The BirdLife Secretariat and Global Seabird Programme have consulted with relevant seabird experts to identify a preliminary list of seabird breeding sites in Peru and Chile. Forest and Bird (BirdLife in New Zealand) is actively engaged in compiling a seabird colony register for New Zealand, which is forming the basis for a Pacific-wide register. They are also in the process of identifying at-sea IBAs on the basis of hotspots identified from satellite tracking data, and are using the results to advocate for the more effective management of fisheries within the New Zealand EEZ.

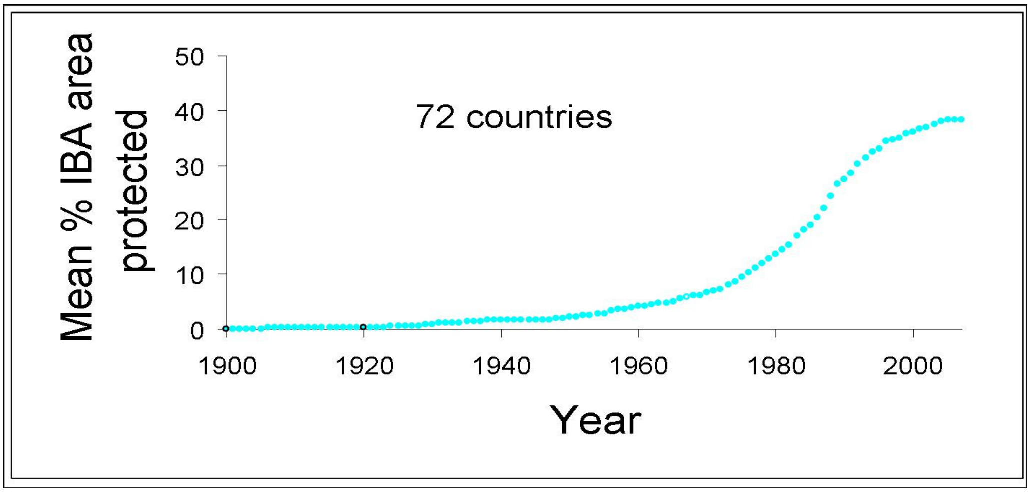
3.1 Using IBAs to measure progress

The CBD is committed to the identification, protection and management of the most important sites for species and habitats to safeguard biodiversity while achieving sustainable development. Sharing a similar philosophy, BirdLife has been working with the CBD for many years, through the Conference of the Parties, the Scientific and Technical Advisory Body and the Secretariat. Since 2003, BirdLife has been an International Thematic Focal Point to the Convention's Clearing-House Mechanism (CHM).

Following CBD COP Decision VIII/15, the "coverage of protected areas" has been used as a headline indicator for the 2010 target and proposes to measure coverage in four ways: the coverage according to the World List of Protected areas, ecological networks and corridors, overlays with areas of key importance to biodiversity, and recognition under national planning –National Biodiversity Strategies and Action Plans (NBSAPs).

In the terrestrial environment many BirdLife Partners have contributed to the development of NBSAPs. In some countries this has taken the form of action plans for threatened bird species; while in others, the IBAs form part of the network of important sites for biodiversity identified. BirdLife has been monitoring the successes of getting IBAs recognised as protected areas around the globe and providing data on IBAs as areas of key importance to biodiversity (see Box 5).

Box 5: Change with time of the proportion of IBAs receiving protection in 72 countries. BirdLife unpublished data.



Coverage of protected areas is an important 'response' indicator for the 2010 target to reduce significantly the rate of loss of biodiversity. However, just measuring the extent of protected areas does not show if they are in the right places. Overlaying them on important sites for biodiversity such as IBAs gives a more informative measure of how well biodiversity as a whole is being safeguarded by protected areas.

In the marine environment the CBD has set a target of "establishing comprehensive networks of MPAs by 2012". Building on the successes in the terrestrial environment, marine IBAs will be a key reference for government efforts to achieve this CBD target, and so help fulfil Articles 5, 6, 7, 8, 12, 13, 14, 17 and 18 of the Convention.

In areas beyond national jurisdiction, criteria have been developed to help achieve this goal through the identification of Ecologically and Biologically Significant Areas (EBSAs), marine IBAs are again likely to play an important roll in achieving this.

3.2 Linkages between marine IBAs and EBSAs

In 2008 the Conference of the Parties to the CBD adopted criteria and guidance for "identifying ecologically or biologically significant marine areas and designing representative networks of marine protected areas in open ocean waters and deep sea habitats"[2]. The seven criteria agreed and the properties and components required for a representative network provide a framework for identifying EBSAs that closely matches that of the IBA Programme.

The IBA and EBSA criteria show considerable overlap and congruence, with the IBA criteria fitting within the broader criteria for EBSAs. Marine IBAs identified using BirdLife's criteria could therefore be considered EBSAs (Tables 2 and 3).

CBD EBSA criteria	BirdLife IBA criteria
Uniqueness or rarity	A1 – relates to rarity as defined by the IUCN Red List: all species listed as Critically Endangered, Endangered, Vulnerable, Near Threatened and Data Deficient may qualify. A2 – relates to restricted-range species and is therefore another measure of uniqueness. A3 - relates to biome-restricted assemblages of species; these species-groups are confined to particular biomes and reflect another facet of uniqueness. Note that category A3 has not been applied yet to seabirds, as the resources to do so have been lacking. It may result in the identification of relatively large sites. Species richness of seabirds may not necessarily correlate well with diversity in other marine taxa
Special importance for life-history stages of species	All IBA criteria can be applied during any life-history stage provided the species is amenable to a site-based approach during that time. The A4 category (for congregations) is designed to select sites of special importance for species when breeding, feeding or resting in the non-breeding season or on migration.
Importance for threatened, endangered or declining species and/or habitats	A1 – Sites identified under A1 are of special importance to threatened species listed on the IUCN Red List.
Vulnerability, Fragility, Sensitivity, or Slow recovery	A1 – The A1 category applies to species that are assessed to be the most vulnerable to extinction.
Biological productivity	No IBA criteria specifically address productivity. However, seabird hotspots are invariably located in areas where productivity is high. The A4 category on congregations, applied to concentrations of feeding birds, is thus likely to be closely related to biological productivity.
Biological diversity	Category A3 (biome-restricted assemblages) relates to contextual species richness (i.e., within a biome), an important element of diversity. More generally, seabirds are excellent indicators as to the state of the wider marine environment, and a network of IBAs is likely to include a high proportion of biological diversity in general.
Naturalness	Again while no specific IBA criteria address naturalness, the majority of IBAs are identified in naturally occurring situations (e.g. for seabirds they do not look to include areas such as rubbish dumps, sewage outflows, or association with fishing fleets).

Table 2: Comparison of EBSA and IBA criteria (EBSA criteria are taken from Annex I of the Azores Scientific Criteria and Guidance Brochure; IBA criteria are covered in more detail in Box 1 of this report)

[2] COP Decision IX/20 paragraph 14; COP Decision IX/20 Annex I, and COP Decision IX/20 Annex II

Required network properties and components	Definition	Applicable site specific considerations (*inter alia*)	BirdLife International marine IBA fit
Ecologically and biologically significant areas	Ecologically and biologically significant areas are geographically or oceanographically discrete areas that provide important services to one or more species/populations of an ecosystem or to the ecosystem as a whole, compared to other surrounding areas or areas of similar ecological characteristics, or otherwise meet the criteria as identified in annex I.	Uniqueness or rarity	See Table 2 above where these criteria are dealt with in more detail.
		Special importance for life history stages of species	
		Importance for threatened, endangered or declining species and/or habitats	
		Vulnerability, fragility, sensitivity or slow recovery	
		Biological productivity	
		Biological diversity	
		Naturalness	
Representativity	Representativity is captured in a network when it consists of areas representing the different biogeographical subdivisions of the global oceans and regional seas that reasonably reflect the full range of ecosystems, including the biotic and habitat diversity of those marine ecosystems.	A full range of examples across a biogeographic habitat, or community classification; relative health of species and communities; relative intactness of habitat(s); naturalness	The IBA programme has been applied worldwide using the global A-level criteria. Criteria have also been applied at a regional or sub-regional scale in some areas (e.g. Europe, Middle East, Caribbean, N. America). Seabirds range across a wide diversity of marine ecosystems and IBA Programme aims to identify sites that cater for each species' entire geographic range and life-history stages (wherever it is amenable to site-based conservation).

Table 3: Properties and components required for achieving a representative network of EBSAs (as defined by Annex II Azores Scientific Criteria and Guidance Brochure) compared with the properties and components of IBA networks

Table 3 continued:

Required network properties and components	Definition	Applicable site specific considerations (*inter alia*)	BirdLife International marine IBA fit
Connectivity	Connectivity in the design of a network allows for linkages whereby protected sites benefit from larval and/or species exchanges, and functional linkages from other network sites. In a connected network individual sites benefit one another.	Currents; gyres; physical bottlenecks; migration routes; species dispersal; detritus; functional linkages. Isolated sites, such as isolated seamount communities, may also be included.	IBAs form a network of sites across regions and globally. Linkage between sites is well developed through the flyways approach for terrestrial and freshwater environments, and is currently under development for the marine environment. The initial pilots are for seabird flyways in the East and West Pacific Ocean (East Asia-Australasia Flyway), building on the migration routes of a wide range of pelagic seabirds to identify an appropriate network of sites. Migration bottlenecks are one of the four types of marine IBA mentioned in Section 2.1. A number of sites have already been identified. Currents, gyres, and seamounts have been identified as some of a number (more than those listed) of key oceanographic variables that affect seabird distribution and result in aggregations that may trigger IBA criteria and help delineate marine IBAs.
Replicated ecological features	Replication of ecological features means that more than one site shall contain examples of a given feature in the given biogeographic area. The term "features" means "species, habitats and ecological processes" that naturally occur in the given biogeographic area.	Accounting for uncertainty, natural variation and the possibility of catastrophic events. Features that exhibit less natural variation or are precisely defined may require less replication than features that are inherently highly variable or are only very generally defined.	In most cases several breeding sites and feeding areas will meet the IBA criteria for each species. Exceptions may exist where a species nests in a restricted area (e.g. single-island endemics), or when species feed widely dispersed at sea, in low densities. However, for most species with adequate data, numerous IBAs will be identified, and include areas used at each stage of the annual and life-cycles.
Adequate and viable sites	Adequate and viable sites indicate that all sites within a network should have size and protection sufficient to ensure the ecological viability and integrity of the feature(s) for which they were selected.	Adequacy and viability will depend on size; shape; buffers; persistence of features; threats; surrounding environment (context); physical constraints; scale of features/ processes; spill-over / compactness	IBA boundaries are invariably set to try to ensure adequate provision of the necessary resources throughout the time the qualifying species occupy the site. See Box 2 for further information.

SECTION 4 - Conclusions

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1. There is an excellent match between criteria for defining EBSAs and IBAs, which is of relevance to the protection of the marine environment in Areas Beyond National Jurisdiction (ABNJ). This is particularly so for criteria relating to vulnerability and irreplaceability.

2. EBSAs will need to comprise sites identified as important for a variety of taxa, ranging from species that are sedentary throughout life to those that are highly mobile and pelagic during all life-history stages. In theory, it is much easier to locate and protect sites for sedentary taxa and those which are closely tied to permanent geographic features.

3. Seabirds can contribute substantially to this (e.g. when breeding and particularly at oceanic islands) but are likely to be especially valuable for contributing to (and identifying) EBSAs critical for taxa which are pelagic for much of their annual and life-cycles.

4. Many seabird species are spectacularly mobile, travelling many thousands of kilometres across international waters and multiple Exclusive Economic Zones; yet they repeatedly utilise a variety of predictable habitats and oceanographic features in their quest to find food. Among the features shown to be important for seabirds are: islands, shelf breaks and seamounts (e.g. Haney *et al.*, 1995; Thompson 2007; Rogers 2004); specific benthic habitats (e.g. Velando *et al.* 2005); specific food sources both directly (e.g. Klages and Cooper 1997) and indirectly (Hebshi *et al.*, 2008); upwellings (e.g. Duffy 1989; Crawford 2007); eddies (Hyrenbach, 2006); and frontal regions, convergence zones and tidal currents (Ladd *et al.* 2005). Thus, hotspots for seabirds are frequently those vital for other marine coastal and pelagic biodiversity (Falabella *et al.* 2009), for many taxa of which few reliable distributional data are available.

   Seabirds are also widely regarded as excellent indicators of the "health" of the marine environment (Parsons *et al.* 2008, Gregory *et al.* 2003, Zöckler and Harrison 2004), being easily observed, identified, reliably surveyed and monitored.

5. Thus, marine (i.e. defined on the basis of seabird data) IBAs are likely to be strong candidates for the identification of, or inclusion within, EBSAs.

6. Quantitative data (especially from remote-tracking studies) on seabird distributions at sea can also make major, perhaps unique, contributions to:

   a. Networks of EBSAs to protect multiple stages of annual cycles of life history;

   b. Analysis of irreplaceability for different levels of global threat;

   c. Identification of migratory pathways, including key staging and source/destination areas, essential to any comprehensive EBSA network. This would also make major contributions to addressing issues of representativity, connectivity and replication of ecological features.

7. To develop this further will need comprehensive analysis of seabird tracking and distributional data (in conjunction with comparable data for other taxa where available), especially those within the BirdLife Global Procellariiform Tracking Database (BirdLife 2004d and see also Annex II of this document). Such data have already produced maps of key feeding and foraging areas for selected seabird taxa for several Regional Fishery Management Organisations whose areas of application are mainly in ABNJ (See Annex II for examples).

8. The Birdlife Secretariat, in collaboration with the Global Seabird Programme and in-country stakeholders, is well placed to lead on this analysis, building on the experiences gained and methodological advances made through the IBA Programme.

Global Agreements – The Agreement on the Conservation of Albatrosses and Petrels

The Agreement on the Conservation of Albatrosses and Petrels (ACAP), which was established under the auspices of the Bonn Convention on the Conservation of Migratory Species (CMS) in 2004, currently has 13 member countries and covers 29 species. It is a multilateral agreement which seeks to conserve albatrosses and petrels by coordinating international activity to mitigate threats to albatross and petrel populations. The accord means that fishing vessels using the waters of ratifying countries are obliged to take measures to reduce seabird by-catch. For details, see the ACAP web site www.acap.aq

BirdLife has been heavily involved with the development and subsequent work of ACAP since 1999. BirdLife has been invited to submit a number of documents for consideration at ACAP Advisory Committee meetings, and sits on several of the ACAP Working Groups. The BirdLife Partnership has provided assistance to several countries in their ratification of the agreement.

The BirdLife Global Seabird Programme has done an immense amount to advance the objectives of ACAP, in particular through the development, dissemination and implementation of bycatch mitigation measures by the Albatross Task Force. Considerable effort has also been invested in assessing the effects that Regional Fisheries Management Organisations (RFMOs), particularly the world's five tuna commissions, have on seabird bycatch via analysis of spatial and temporal overlap between bird distribution and longline fishing effort (e.g. ACAP 2007). For details, see www.rspb.org.uk/supporting/campaigns/albatross

Global Agreements – The Ramsar Convention

The Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention) was adopted in 1971. Its mission is the "conservation and wise use of all wetlands through local, regional and national actions and international cooperation, as a contribution towards achieving sustainable development throughout the world". Parties are to designate suitable wetlands for inclusion in the List of Wetlands of International Importance.

BirdLife International was among the founders of the Convention, has a Memorandum of Cooperation with the Ramsar Secretariat and is one of five "International Organisation Partners"[3] of the Convention. In this capacity BirdLife is involved in many activities relating to the Conference of Parties, the Standing Committee, the Scientific and Technical Review Panel, and in Ramsar regional meetings

There is a close compatibility between BirdLife IBA criteria and relevant parts of the criteria agreed by Ramsar Parties for the identification of wetlands of international importance. This has meant that the Ramsar Convention has become perhaps the most important global mechanism for BirdLife Partners in their national work. Many Partners have contributed to the designation of IBAs as Wetlands of International Importance in their countries, and many help to monitor these sites. A number of Partners assist Parties with their implementation of the Convention, for example through participation in National Wetland Committees and in the development of National Wetland Policies. For details, see the Ramsar web site, www.ramsar.org

Regional IBA inventories have been used to select potential Ramsar sites for Europe (BirdLife International 2001), Africa (BirdLife International 2002) and Asia (BirdLife International 2005). This was done by i) compiling lists of all bird species per region ecologically dependent on wetlands; ii) analysing IBA datasets to determine which sites qualified as internationally important for wetland-dependent species under IBA criteria; iii) excluding all such sites which, according to Ramsar definitions, lacked any wetland habitat and iv) categorising all remaining IBAs as to whether their Ramsar designation was complete (covering all habitat important for key wetland birds – i.e. those that trigger IBA and corresponding Ramsar criteria), partial or lacking.

[3] The others are IUCN – the World Conservation Union; the International Water Management Institute; Wetlands International; and the World Wide Fund for Nature.

Regional Agreements – European Union Birds Directive
Among other measures, the Birds Directive requires the creation and proper management of a coherent network of Special Protection Areas (SPAs) for 181 bird species, subspecies or populations that are considered the most threatened in Europe, as well as for all other migratory bird species and for all wetlands of international importance (Ramsar Sites).

The European network of IBAs has formed an important scientific reference for the designation of SPAs under the Birds Directive. The means by which BirdLife identifies Important Bird Areas (IBAs) in Europe is directly relevant in this context, as some of the selection criteria for IBAs were deliberately aligned with those for SPA selection criteria. Consequently, the value of the IBA inventory as a 'shadow list' of SPAs has been recognised by the European Court of Justice and the European Commission. This has helped to bring about an increase in the designation (partial or entire) of IBAs as SPAs from 30% to 54% in the period 1989-1999 despite an overall increase in the number of IBAs recognised over this period (see figure).

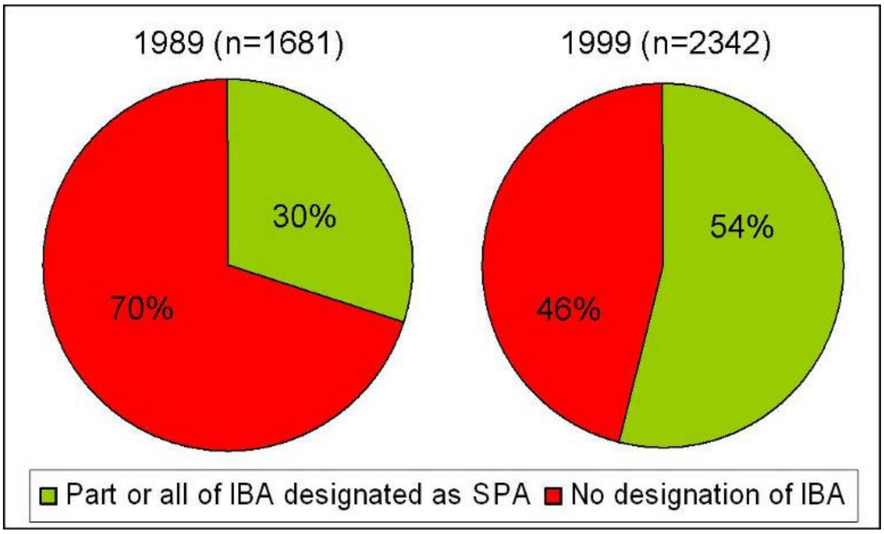

Figure 4: Designation of IBAs as SPAs in the European Union in 1989 and 1999 (BirdLife International 2004b)

Regional Agreements – others
For marine IBAs, there are additional European instruments of relevance to the marine environment, including the OSPAR Convention[4], the Helsinki Convention[5] and the Barcelona Convention[6].

Outside Europe, the Nairobi[7] and Abidjan[8] Conventions provide mechanisms for regional cooperation, coordination and collaborative actions to achieve protection, management and development of the marine and coastal environment of the Eastern African Region and West and Central African Regions respectively. In South East Asia, the Association of South East Asian Nations (ASEAN)[9] has a mandate to "set up protected areas including natural parks and reserves to conserve biological diversity, and especially endangered species".

BirdLife is already involved in providing relevant IBA information to these conventions to ensure they are considered in maritime planning and protected area programmes for these regions.

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[4] Convention for the Protection of the Marine Environment of the North-East Atlantic which entered into force in 1998
[5] Convention on the Protection of the Marine Environment of the Baltic Sea Area (1992); entered into force in Jan 2000
[6] Convention for the Protection of the Mediterranean Sea against Pollution (1976) and its Protocol concerning Mediterranean specially protected areas (1982)
[7] The Nairobi Convention for the Protection, Management and Development of the Marine and Coastal Environment of the Eastern African Region was signed in 1985 and came into force in 1996
[8] The Convention for Co-operation in the Protection and Development of the Marine and Coastal Environment of the West and Central African Region (Abidjan Convention) was adopted in 1981.
[9] Agreement on the Conservation of Nature and Natural Resources for the Member States of the Association of South East Asian Nations (ASEAN).

National Agreements – IBAs and Protected Areas in 10 African countries

In Africa, recognition of the value of IBAs is resulting in the designation of new protected areas. Between 1998 and 2002, a project entitled 'African NGO-Government Partnerships for Sustainable Biodiversity Action' was run collaboratively by BirdLife Partner organisations in Africa, supported in part by GEF-UNDP. The aim of the project was to enhance biodiversity conservation in Africa through local and national NGO-government partnerships in the IBA programme. Across the ten countries involved—Burkina Faso, Cameroon, Ethiopia, Ghana, Kenya, Sierra Leone, South Africa, Tanzania, Tunisia and Uganda—a total of 472 IBAs were identified. Of these, 55% had some form of legal protection at the time the project started. One of the project's successes was that, by its end, an additional 50 IBAs from all project countries had acquired some form of protected-area status (see Fig. 5). Follow-up activities in all ten countries have continued, ensuring that the successes of this project are built upon. This has including further lobbying for the as-yet unprotected sites, such that by 2007 a further 19 sites had been given some form of protection. Similar work is expanding into other countries in the region (see Coulthard 2002).

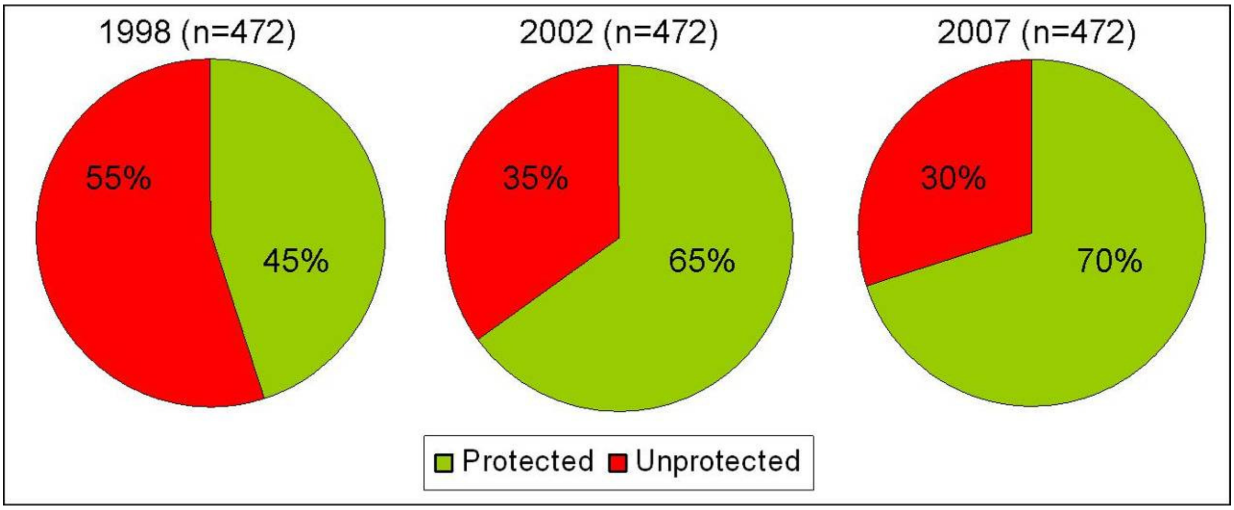

Figure 5: One of the outcomes of a five-year project in Africa is that 69 IBAs across 10 countries have been given legal protection. (BirdLife International 2004b)

Many national mechanisms exist that allow for the identification and designation of Marine Protected Areas and a wide range of BirdLife Partners are working with relevant national authorities to ensure that marine IBAs are included in the process. Examples include work undertaken by the BirdLife Partners: Forest and Bird in New Zealand[10], Audubon in the USA[11], and Birds Studies Canada in Canada[12].

[10] An objective of the New Zealand Biodiversity Strategy (NZBS) is to expand the network of marine protected areas (MPAs), using marine reserves and other forms of legal protection, so that it fully represents the range of New Zealand's coastal and marine ecosystems and habitats. By 2010, the government aims to have protected 10 per cent of the marine environment.

[11] The USA initiated a program for the designation of Marine Protected Areas in 2003, and by 2006 there have been between 1500 and 2000 sites designated nationwide. Some of these are administered by five federal programs: National Park Service, US Fish & Wildlife Service, and the three branches of National Oceanic and Atmospheric Administration (NOAA): National Estuarine Research Reservation program, National Marine Fisheries Service, National Marine Sanctuary Program. Other sites are under the jurisdiction of 22 states and territories including overseas territories and islands. With less than 0.5% of U.S. territorial waters protected in National Marine Sanctuaries, there is an increasing interest in multi-state initiatives in the US.

[12] Protected marine areas can be created in Canada under legislation administered by three federal agencies: Department of Fisheries and Oceans (DFO), Parks Canada, and Environment Canada.

ANNEX II - examples of marine IBA identification

Seaward extensions

It has been proposed that many IBAs, identified on the basis of the seabird breeding colonies they support, could be protected more effectively by extending the limits of the site to include, where possible, some or all of the foraging area used by the breeding birds (see example in Fig. 6).

With this in mind, BirdLife has compiled a database of seabird foraging distances, dive depths, and at-sea habitat preferences. The aim of the database is to provide an authoritative global dataset that can be used as a key tool to help delimit the extent of marine IBAs adjacent to major breeding colonies, as well as highlight gaps in our knowledge of foraging behaviour and help identify key areas for future research.

Compiling the database has involved a comprehensive review and collation of published information on seabird foraging ranges. Additional information has been sought from seabird experts worldwide, who have helped identify and fill gaps via the provision of further references or of unpublished information. The database entries include as much as possible of the following information: date and location of the study, stage of the breeding season, foraging distance, trip duration, dive depth, habitat associations, data quality and survey methods. For some species this information has been distilled into foraging fact sheets providing background and justification as to why specific distances, depths and habitats may be most appropriate for seaward extensions.

Information in the database was initially used to trial proposed extensions on the relevant IBAs in France, Italy and Peru. The results from these trials were included in a guidance document (Lascelles, 2008), forming part of a marine IBA toolkit, which provides advice and examples on how to use the database. Since then the foraging radii approach has been used to delineate IBAs included in the marine IBA inventories of Spain and Portugal.

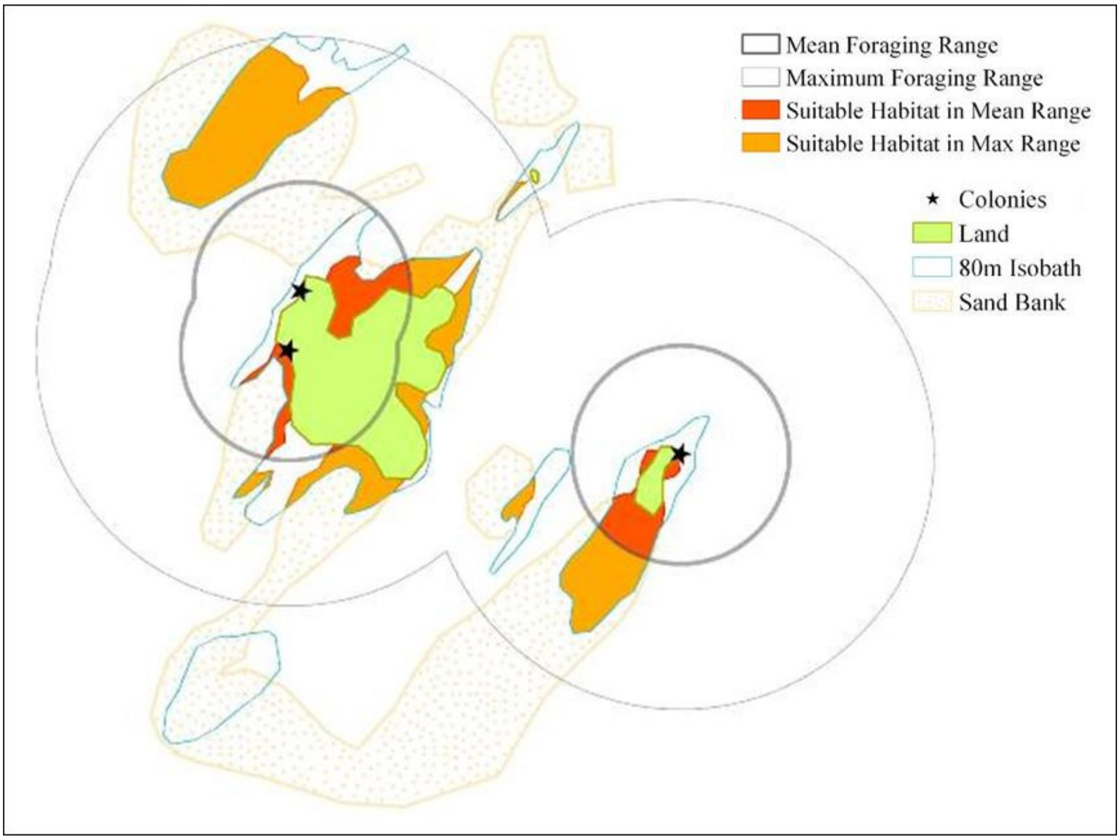

Figure 6: Theoretical seaward extensions to IBAs (identified for breeding colonies) for European Shag *Phalacrocorax aristotelis*, using foraging range (ave. 7km, max 17km), dive depth (max 80m) and habitat preferences (sand)

Non-breeding (coastal) congregations
These include sites, usually in coastal and/or shallow areas, which hold feeding and moulting concentrations of waterbirds, such as divers, grebes and sea-ducks.

Thanks to the increasing knowledge of the importance of inshore waters for waterbirds a number of inshore sites have been identified particularly in the Baltic and North Sea areas. Work by Skov *et al.* (2000) and Durinck *et al* (1994) identified many IBAs within the Baltic and North Sea, the majority of which related to sites for predominantly inshore species such as divers, grebes and sea-duck (see example in Fig. 7). Many of these species have a restricted prey base and have specific preferences for particular habitat types and water depths, all factors that should be considered when identifying and delimiting sites for them to ensure that suitable habitats are included within the site boundaries.

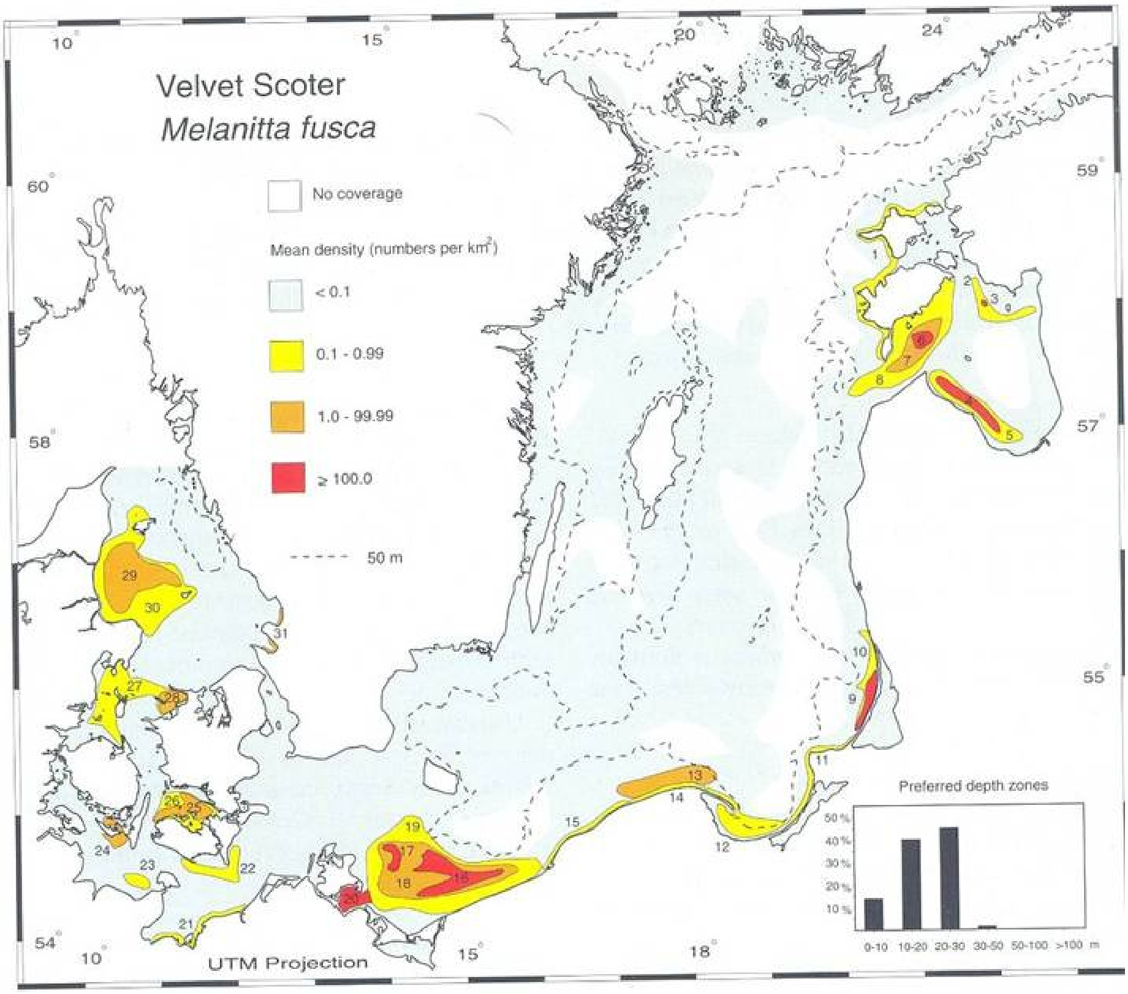

Figure 7: Distribution and density of wintering Velvet Scoter *Melanitta fusca* in the Baltic Sea 1988–1993 (taken from Durinck *et al.* 1994)

An EU LIFE funded project (2005–2009, managed by the Baltic Environmental Forum, and involving BirdLife Partners in Estonia and Latvia) is identifying and protecting marine areas (including IBAs) of the eastern Baltic Sea. As part of this project, a workshop entitled "Bird conservation in the marine environment: identification, designation and protection of marine protected areas (MPAs) for birds in the Baltic Sea and beyond" was held in Latvia in 2007 and brought together 50 specialists (including representatives from 7 BirdLife Partners) to discuss methodologies, and work to date in the region and ways forward. Through this project it will be possible to refine the existing IBA inventories for Estonia, Latvia and Lithuania, and to protect these marine sites effectively under Natura 2000. The project aims to promote transboundary networking and capacity building on MPAs, which will help in the further development of marine IBAs in other parts of Europe and the world.

Migratory Bottlenecks

These are areas that, due to geographical constrains, act as bottlenecks for the migration of seabirds, and constrain the movements of entire bird populations (or a large share of them) during migration. Globally, to date, there have been relatively few bottleneck sites identified for seabirds, partly due to the difficulty in identifying and delimiting these kinds of sites, but also due to the pelagic nature of many seabirds that means they are unlikely to venture close to land and through areas that act as geographical constraints.

The Sociedad Española de Ornitología (SEO), the BirdLife Partner in Spain, has, with EU LIFE funding, undertaken a project (2004–2008) to inform the future designation of SPAs and IBAs in coastal and pelagic waters. The project carried out detailed inventories, using objective methodological criteria to determine IBAs for seabirds. They identified IBA under each of the four types recognised by Osieck (2004), including bottleneck sites. See section on Networks of Sites in Annex II for more information.

The Strait of Gibraltar is one of the most important migratory bottlenecks for seabirds in the west Palaearctic (see Fig. 8). The strait acts like a funnel through which hundreds of thousands of migratory seabirds pass to enter the Mediterranean and depart to the Atlantic. It is important for both those species that reproduce in the Mediterranean and those that winter there. The fact that it is the only exit by sea means that all or at least most of the world's population of some species pass through it, as is the case for Balearic Shearwater *Puffinus mauretanicus*, Audouin's Gull *Larus audouinii* and the Mediterranean subspecies of Cory's Shearwater *Calonectris diomedea diomedea*.

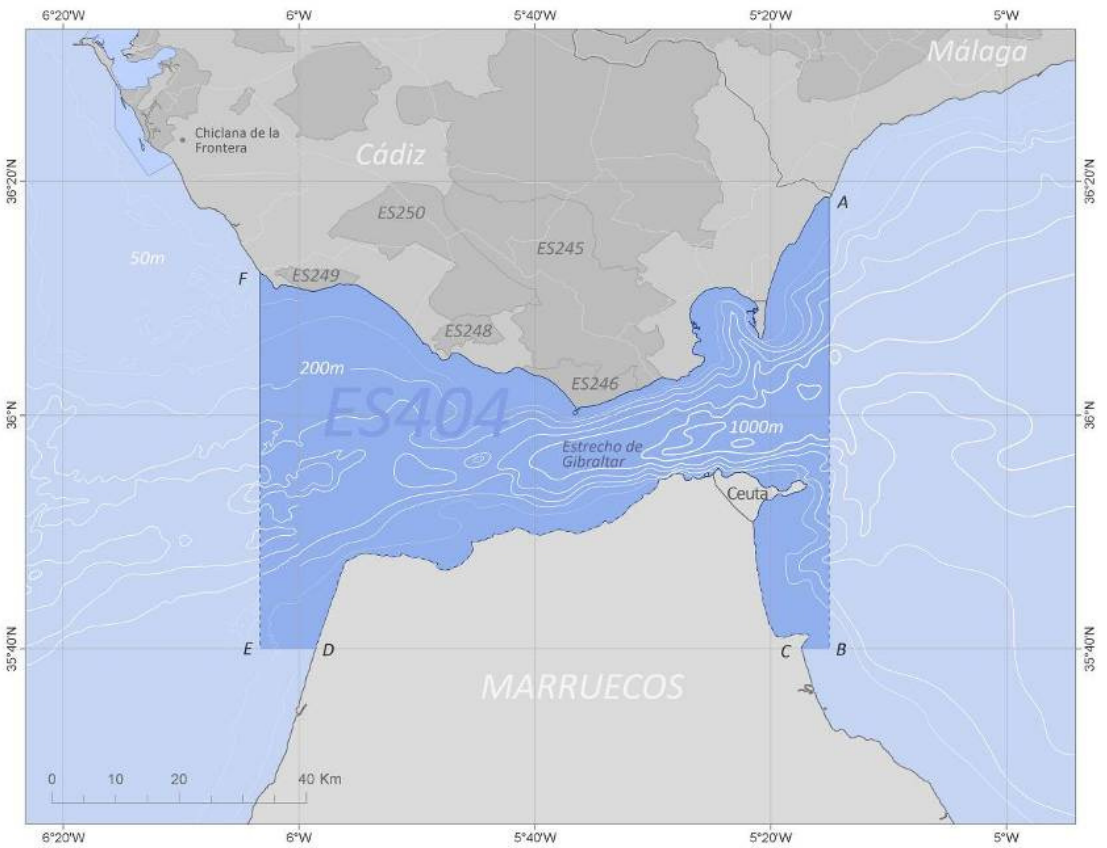

Figure 8: IBA ES404 Estrecho de Gibraltar. Location: 35º59'20"N, 05º39'09"W, Area: 2.569km²

The Strait of Gibraltar site highlights an issue that is likely to occur repeatedly in the marine environment, both for IBAs and EBSAs. The site is transboundary in nature, and the IBA boundaries currently embrace waters from three countries, disputed areas and international waters. International cooperation is necessary to manage this site effectively, as it will be for many others.

Areas for Pelagic Species

These sites comprise marine areas often remote from land where pelagic seabirds regularly occur in large numbers, primarily for foraging purposes. These areas usually coincide with specific oceanographic features related to high biological productivity.

Until the last few years, relatively little attention had been paid to the identification of offshore areas important for predominantly pelagic species. Apart from lack of information this has been due to the limited legal possibilities for site protection. IBA boundary selection guidelines indicate that an IBA should be an area which can in some way be managed. This has implications for the selection of areas at sea where ability to manage is severely curtailed. However, with recent advances in tracking technologies, and more widespread surveys of waters far from shore, data for seabirds in pelagic areas have gradually become more available.

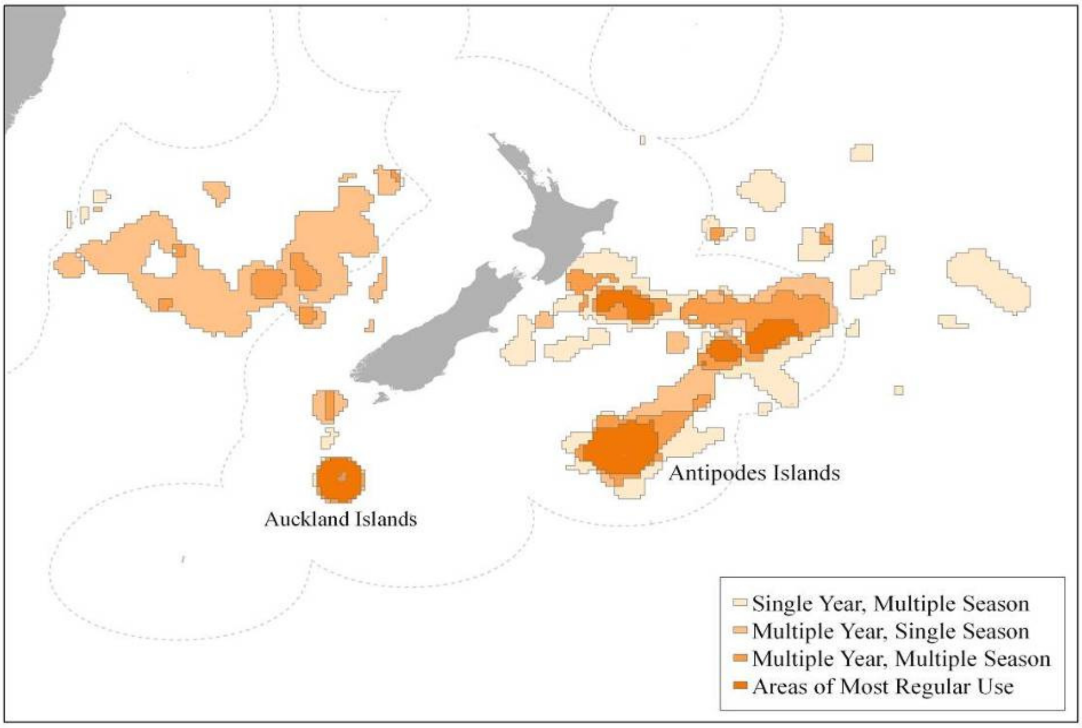

Figure 9: Map showing areas of "regular use" during different life-history for Antipodean Albatross *Diomedea antipodensis* tracked from New Zealand. Data provided by Kath Walker (Department of Conservation, New Zealand) and David Nicholls (Chisholm Institute, Australia)

In the example shown in Fig. 9, tracking data has been used from the Global Procellariiform Tracking Database which is managed by BirdLife's Global Seabirds Programme. It has been proposed (BirdLife 2009) that a regularly used hotspot identified solely on tracking data should be required to meet the following conditions:

> *"Areas visited by birds from more than one site or during different periods (seasons or years)"*

To determine which areas within the Antipodean Albatross tracking dataset met these conditions of 'regular use' the data were split according to the life-history stages outlined by Brooke (2004). This allows the identification of sites of importance during both the breeding season (consisting of pre-egg, incubation, brood-guard, and post-guard periods) and non-breeding season. Utilisation Distributions (UDs) were calculated for each life-history stage and the 50% UDs were used to represent core areas of activity[13]. These layers were then combined to create a map of most regular use showing areas important for multiple life-history stages (seasons) in multiple years.

[13] The 50% utilisation distribution has been commonly used to represent core activities for a number of seabirds, including the great albatrosses, see BirdLife International (2004d).

Networks of sites

Ultimately, to achieve conservation success, a coherent network of sites is required that adequately includes the most important areas for all life-history stages of those species amenable to a sites-based approach (see example in Fig. 10).

Work in Iberia

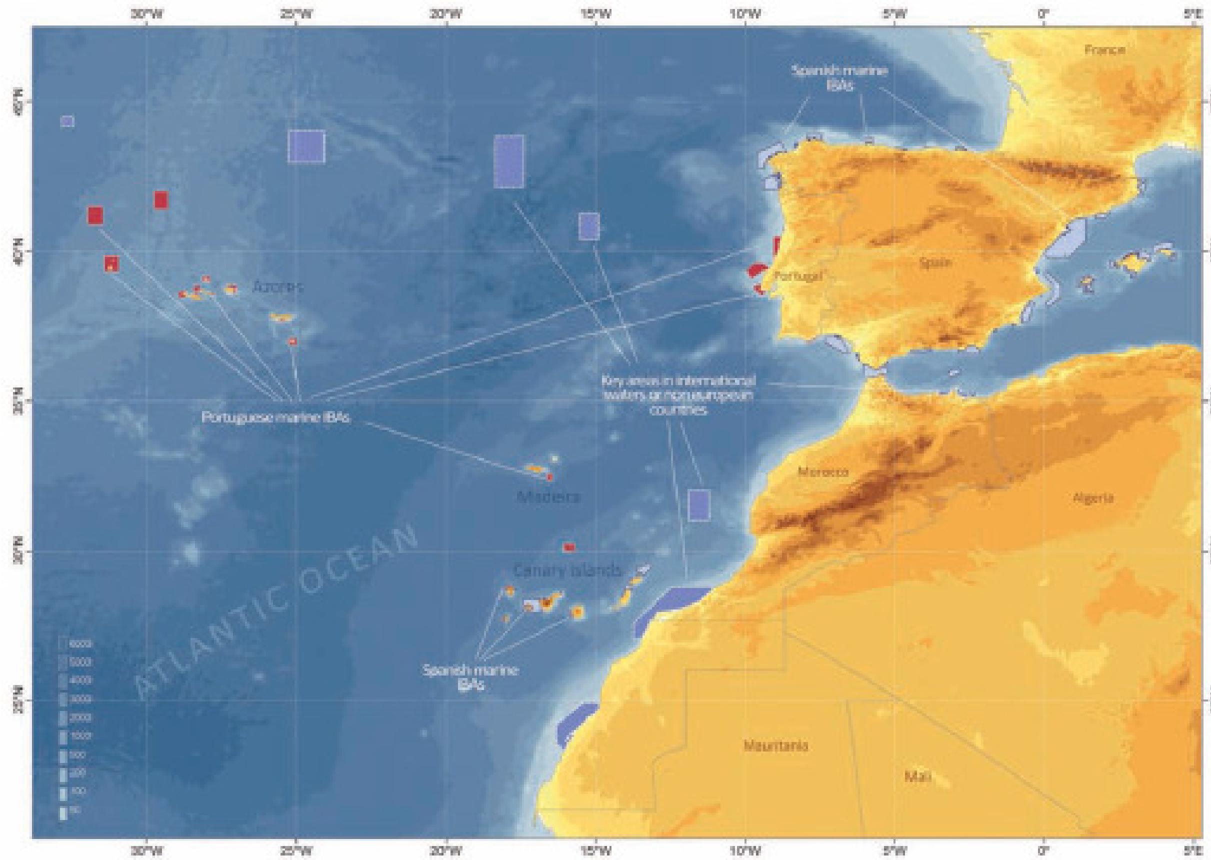

Figure 10: Marine IBAs identified in Spain, Portugal, and some other nations in Macaronesia as well as on the high seas, under the EU LIFE projects administered by SEO/BirdLife and SPEA

The oceanic area under Portuguese jurisdiction is eighteen times the size of its land area, and Spanish waters comprise three biogeographical marine regions (Mediterranean, Atlantic and Macaronesia). Together, they hold a wide diversity of seabird species, some of which are globally threatened. The Sociedade Portuguesa para o Estudo das Aves (SPEA) and the Sociedad Española de Ornitología (SEO) both conducted 4-year EU LIFE funded projects (2004–2008) which identified the most significant marine areas for seabirds within the region.

Both projects collected information on seabird species distribution (through tracking studies and transect surveys) as well as oceanographic variables (e.g. temperature, productivity, currents etc.) and investigated the relationship between them. Jointly, their marine IBA inventories include 59 marine IBAs, 42 of which are in Spain (42,584 km²) and 17 in Portugal (14,551 km²). In addition, both projects have identified areas of interest away from their national jurisdictions, both in other countries' territories and in international waters. These projects illustrate the need for international collaboration, including working with international agreements, in order to create networks of marine protected areas that should ensure the protection of seabirds and other marine biota.

Further information on these projects can be found here:
SPEA: http://lifeibasmarinhas.spea.pt/y-book/ibasmarinhas/
SEO: www.seo.org/programa_intro.cfm?idPrograma=32

The Global Procellariiform Tracking Database

In 2004, BirdLife International published 'Tracking Ocean Wanderers' (BirdLife International 2004d). The report was the result of a unique collaboration between scientists worldwide, analysing the distribution of albatrosses and petrels across the world's oceans. The report included analysis of over 90% of the world's albatross satellite-tracking data then existing. The results highlighted areas where longline fleets are putting albatrosses at most risk, and are being used to target conservation efforts more effectively in crucial areas for albatrosses across the world's oceans.

All data used in the report, with subsequent additions, are held in the Global Procellariiform Tracking Database (see Fig. 11), managed by the Global Seabird Programme of BirdLife International. Data holders have established a protocol for access to and sharing of the database, which, as of 2008, held data on 28 species contributed by 57 scientists from 11 countries. The database thus represents a vital tool for the conservation of these species. The database highlights:

- The importance of highly productive oceanic regions such as the Humboldt Current, the Patagonian Shelf, the Antarctic Polar Frontal Zone, and the Benguela Current. These are areas where the upwelling of cold ocean currents results in rich feeding grounds for albatrosses as well as fish and other marine species
- The importance of coastal and shelf areas for albatrosses while they are feeding chicks.
- The overlap between the distribution of albatrosses and areas of longline fishing. More than 300,000 seabirds, including 100,000 albatrosses, die as bycatch at the hands of longline fleets every year. This has left all 21 albatross species under global threat of extinction
- The huge distances travelled on migration by some species; the Northern Royal Albatross flies up to 1,800 kilometres in 24 hours and the Grey-headed Albatross can circle the globe in 46 days.

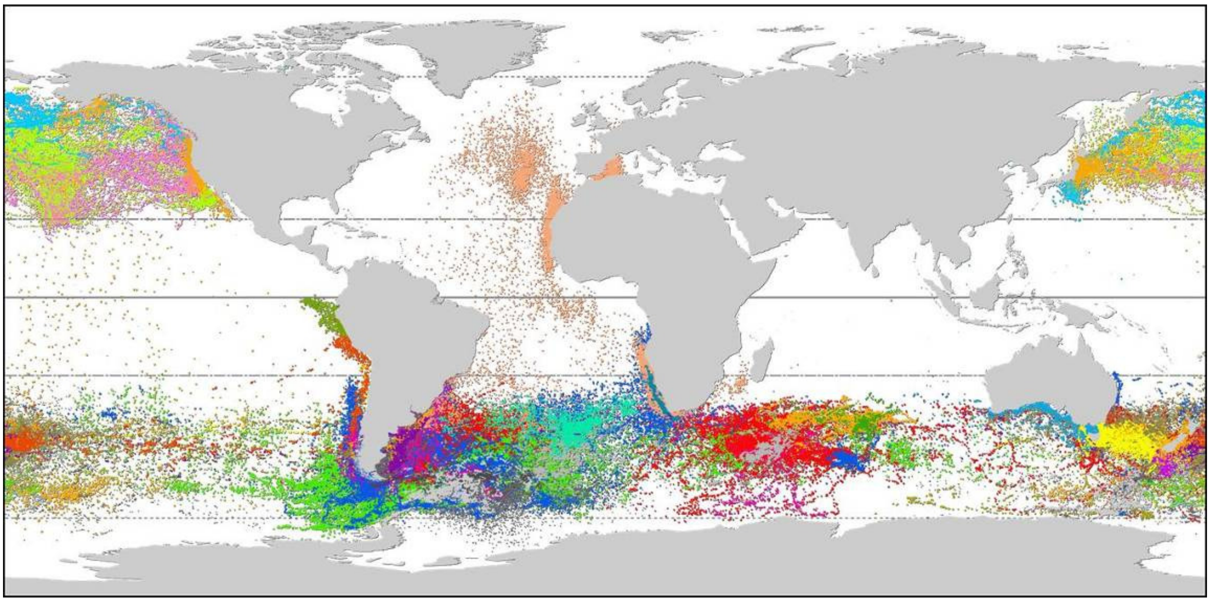

Figure 11: Summary of data held within the Global Procellariiform Tracking Database, which includes 3,764 tracks totalling 957,148 hours from Platform Transmitter Terminal (PTT) and Global Positioning Satellites (GPS), and 721 tracks totalling 61,832 days from Geolocators (GLS)

A key use of the database has been in work with Regional Fisheries Management Organisations (RFMOs), particularly the world's five tuna commissions, whose fisheries cover both high seas and EEZs. Since 2005, the BirdLife Global Seabird Programme has been working with RFMOs, presenting analyses of the hotspots of albatross and petrel distribution within RFMO areas (Figure 12) and determining the spatial and temporal overlap between bird distribution and longline fishing effort (Figure 13). These analyses have proven vitally effective tools in reducing seabird bycatch. Four of the five global tuna commissions have now adopted requirements for use of seabird bycatch mitigation measures by their longline vessels, with hopes that the fifth will adopt a measure in 2010. This compares to only one tuna commission (CCSBT) having mitigation requirements in 2005.

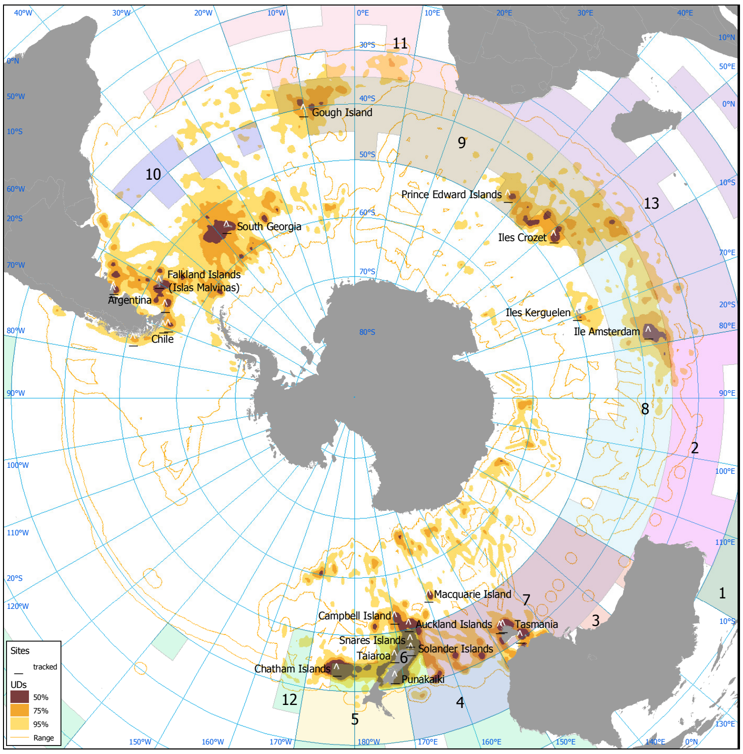

Figure 12: Analysis produced in 2006 for the Commission for the Conservation of Southern Bluefin Tuna (CCSBT). Combined utilisation distribution map for the breeding distribution of 20 southern-hemisphere species represented in the BirdLife International Global *Procellariiform* Tracking Database, and the overlap with the CCSBT area (1999-2003). Each species has been given equal weighting. (BirdLife International, 2006)

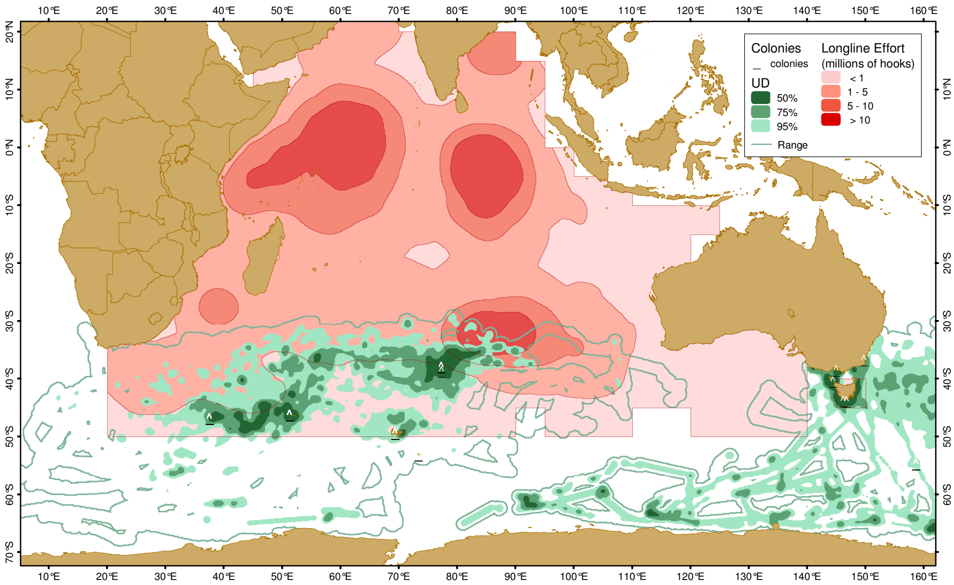

Figure 13: Analysis produced by BirdLife in 2007 for the Agreement for Conservation of Albatrosses and Petrels (ACAP) and submitted to the Indian Ocean Tuna Commission (IOTC). Distribution of breeding albatrosses, petrels and shearwaters in the Indian Ocean and overlap with IOTC longline fishing effort for all gear types and fleets (average annual number of hooks set per 5° grid square from 2002 to 2005) (ACAP 2007).

The development of methodologies for analysing tracking data to identify marine IBAs is enabling the identification of the most important sites used during tracking periods. In 2009 Birdlife organised a workshop to refine these methodologies and has produced draft guidelines and examples of the process required to translate tracking data into marine IBAs (BirdLife 2009).

Analysis of the full Global Procellariiform Tracking Database dataset will be a key component in identifying a network of IBAs at sea, both within EEZs and on the high seas.

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