Important Bird Areas in Antarctica 2015

Summary

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Cover photograph

Adélie Penguin colony at Seabee Hook, Cape Hallett, Important Bird Area (IBA) ANT170 and Antarctic Specially Protected Area (ASPA) No. 106. © *era-images* C. Harris 2010.

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Disclaimer

Any opinion, finding, conclusions or recommendations expressed in this work are those of the authors and do not necessarily reflect the views of the National Science Foundation or the governments or organisations that have supported the work.

Contents

List of acronyms and abbreviations

ACAP	Agreement on the Conservation of Albatrosses and Petrels
ADD	Antarctic Digital Database
ASPA	Antarctic Specially Protected Area
ASMA	Antarctic Specially Managed Area
ASI	Antarctic Site Inventory
ATS	Antarctic Treaty System
ATCM	Antarctic Treaty Consultative Meeting
CCAMLR	Convention on the Conservation of Antarctic Marine Living Resources
CEMP	CCAMLR Ecosystem Monitoring Program
CI	Confidence Interval
COMNAP	Council of Managers of National Antarctic Programs
ERA	Environmental Research & Assessment
IAATO	International Association of Antarctica Tour Operators
IBA	Important Bird Area
IUCN	World Conservation Union
NOAA	National Oceanic and Atmospheric Administration
SCAR	Scientific Committee on Antarctic Research

IUCN Red List status

NE	Not Evaluated
DD	Data Deficient
LC	Least Concern
NT	Near Threatened
VU	Vulnerable
EN	Endangered
CR	Critically Endangered
EW	Extinct in the Wild
EX	Extinct

Introduction

Identifying those areas of Antarctica that are most important for birds has its roots in efforts to compile data on the distribution and abundance of Antarctic bird species initiated by the Scientific Committee on Antarctic Research (SCAR) Bird Biology Sub-Committee as early as the 1980s, then Chaired by John Croxall. Around the same time, BirdLife International established the Important Bird Area (IBA)[1] programme to provide a means of identifying sites of international conservation significance for the world's birds. To achieve this, BirdLife International has worked closely with organisations and individuals in the countries concerned. It was natural, therefore, that in the 1990s BirdLife International and SCAR formed a collaboration to compile an IBA inventory for Antarctica. This was initiated at the XXV SCAR Meeting in Concepción, Chile in 1998. Criteria for selection appropriate to Antarctica were agreed at the next meeting held in 2000 in Tokyo, Japan, based on IBA designation criteria established by BirdLife and used elsewhere in the world. SCAR and BirdLife International then held workshops on IBAs in Jena, Germany, in 2002 and in Texel, The Netherlands in 2004, and an initial list of IBAs was identified, which was reappraised by Fijn (2005).

After a gap of several years and with support from the United Kingdom, the initiative was renewed in 2010 to develop a list for the Antarctic Peninsula, South Shetland Islands and South Orkney Islands, which was published in 2011 (Harris *et al*. 2011). This study identified 101 sites that met the BirdLife / SCAR IBA selection criteria (see definitions of IBA criteria below), and full details were published on the Data Zone of the BirdLife web site, from where this report can also be downloaded. Several sites are de-listed in the current assessment as a result of new data (see Table 2).

With further support from the Governments of Australia, New Zealand, Norway and the United States, and the Pew Charitable Trusts, the analysis was extended to include the remainder of Antarctica over 2013-15. First, global population estimates for each species, which determine the thresholds at which a site qualifies as an IBA, were reviewed and updated (Table 1). Drawing predominantly on peer-reviewed literature, in some cases supplemented by unpublished data made available by the science community and personal communications, breeding colony data were then analysed to identify those that meet the criteria, including a spatial analysis to assess where the criterion of 10 000 seabird pairs present within a defined areal unit was met.

The analysis proceeded on a regional basis, circulating initial results to specialists working in these regions for review and comment. As a result, revisions were made and the results for each region were then combined into a consolidated list for the whole of Antarctica. This list proposed 205 IBAs, and was circulated for further comment to more than 90 Antarctic bird scientists world-wide. Following a final round of consultation, the list was revised to give a final total of 204 IBAs.

There are no definitive rules to determine the spatial extent of an IBA, and therefore no clear guidance on how to aggregate the breeding site data that determine whether an area meets the IBA selection criteria (Harris *et al.* 2011). A problem that arises in this context is known as the Modifiable Areal Unit Problem, which is a recognised difficulty in spatial analysis that arises when "the areal units … used in …geographical studies are arbitrary, modifiable, and subject to the whims and fancies of whoever is doing, or did, the aggregating" (Openshaw 1984). That is, results can be influenced by the particular choice of spatial unit used. Therefore Environmental Research & Assessment (ERA) developed a method based on a grid-analysis which serves as a more objective approach for the identification of breeding site IBAs. Specifically, after extensive analyses undertaken to determine breeding site IBAs in the Antarctic Peninsula region (Harris *et al.* 2011), the method employed identified an IBA where:

1. The count at an individual colony meets or exceeds the population thresholds set by BirdLife International for any of the species present at a site for any of the IBA criteria;
2. The result of summing the count at an individual colony for one or more species contained within a 5 km^2 area, or breeding on a landmass ≤ 5 km^2, exceeds the numeric threshold for criterion A4iii;
3. Individual colonies have been defined in accordance with the definitions given in the source data.

[1] In 2013, BirdLife International renamed the 'Important Bird Area' programme as the 'Important Bird and Biodiversity Area' programme (while retaining the acronym IBA) in order to reflect the way in which IBAs frequently capture much other significant biodiversity. However, the original name is retained here to avoid complications arising from the change of name in the final stages of the completion of this inventory.

The analysis has now been extended to include population data available for the breeding bird species listed in Table 1 for the whole of Antarctica south of 60° S. Data are relatively complete for the penguins, although are patchy and incomplete for other species, reflecting to some degree the ease with which different species may be counted. Recent advances in remote sensing platforms and methods have, for the first time, enabled global, synoptic estimates of numbers for Emperor Penguin (*Aptenodytes forsteri*) (Fretwell *et al*. 2012) and Adélie Penguin (*Pygoscelis adeliae*) (Lynch & LaRue 2014), although similar analyses for other species (e.g. Chinstrap (*Pygoscelis antarctica*) and Gentoo (*Pygoscelis papua*) penguins) have yet to be completed, and for some species may prove elusive owing to the difficulties of detecting clear breeding site spectral signatures because of their nesting habits (e.g. burrowing or widely spaced).

It should be noted that at this stage the IBA assessment has been made for breeding sites only, and the wider marine foraging areas of birds remain to be addressed. Consideration of the marine component of IBAs is vital, although is more complex (e.g. including factors such as foraging ecology, breeding colony sizes, physical oceanography, sea ice, prey species distributions, productivity etc.) and for practical reasons this report first gives attention to breeding sites; it is intended that assessment of the marine components will follow as quickly as possible.

Objectives

The aim of this study is to compile a revised and updated list of IBAs for Antarctica south of 60° S based on best available breeding site data for the species listed in Table 1.

Methods

ERA applied the same methodology that was used in the previous study to identify IBAs on the Antarctic Peninsula, South Shetland and South Orkney Islands (Harris *et al*. 2011). In this study, sites were evaluated on the basis of whether individual colonies (as identified in source data) met the thresholds for IBA listing using the selection criteria elaborated below. In addition, to determine whether a site, or sites, met the A4iii criterion of 10 000 seabird pairs present within a specific spatial area, concentrations of seabirds were analysed using a 5 km^2 grid overlay method. The predefined regular 5 km^2 grid was overlaid onto colony centroids for each bird species and the numbers of breeding pairs within each grid cell was then summed. The results were then used to identify grid cells within which the number of breeding pairs for all species present exceeded the A4iii population threshold of 10 000 pairs. When the criteria were met, the site qualified as an IBA, and its spatial extent was then determined using the rules to define the IBA boundary as summarised below.

Definitions of IBA selection criteria

The global (Level A) IBA criteria are used to identify IBAs in this report. These criteria were standardised for global application following extensive consultation amongst experts in the BirdLife International Partnership and related fields (Fishpool & Evans 2001). In some parts of the world additional criteria based on less stringent thresholds are used to identify IBAs of regional significance, although these have not been used in Antarctica.

The following definitions of the IBA selection criteria are based on Fishpool & Evans (2001):

A1: Globally threatened species.

“The site is known or thought regularly to hold significant numbers of a globally threatened species, or other species of global conservation concern”.

The site qualifies if it is known, estimated or thought to hold a population of a species categorized by the IUCN Red List as Critically Endangered (CR), Endangered (EN) or Vulnerable (VU). In general, the regular presence of a CR or EN species, irrespective of population size, at a site may be sufficient for a site to qualify as an IBA. For VU species, the presence of more than threshold numbers at a site is necessary to trigger selection. The site may also qualify if it holds more than threshold numbers of species in the Near Threatened (NT) category. Thresholds are set regionally, often on a species by species basis.

A2: Restricted range species.

"The site is known or thought to hold a significant component of a group of species whose breeding distributions define an Endemic Bird Area (EBA) or a Secondary Area."

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."

A4: Globally important congregations.

A4i: "The site is known or thought to hold, on a regular basis, 1% or more of a biogeographic population of a congregatory waterbird species."

A4ii: "The site is known or thought to hold, on a regular basis, 1% or more of the global population of a congregatory seabird or terrestrial species."

A4iii: "The site is known or thought to hold, on a regular basis, at least 20 000 waterbirds, or at least 10 000 pairs of seabirds, of one or more species."

A4iv: "The site is known or thought to be a bottleneck site where at least 20 000 pelicans and / or storks and / or raptors and/ or cranes pass regularly during spring and / or autumn migration."

Criteria A2, A3 and A4iv are not relevant to the avifauna of Antarctica and so have not been used in this analysis.

Numerical criteria for IBA listing

Final identification of the IBAs requires definition of two main factors:

1. The number of birds breeding at each site by species, and whether these exceed the relevant IBA selection thresholds; and
2. The spatial extent of the site, or boundary of the IBA.

Specifically, the method employed identified an IBA by following the three methodological steps used by Harris *et al*. (2011) as set out in the Introduction (see foot of p.1).

The count for each site is based on totals given in source data for individual colonies. These colonies are represented within the database as points with an associated count. In some cases individual colonies are well-known and defined within a specific location, while in others both the numbers and the spatial delineation of the colony are only poorly defined. In some cases the spatial extent of the colony is unknown. Occasionally populations have been estimated over a number of colonies which may be widely separated (e.g. by up to tens of kilometres), although only a total for the area is given in the source data.

Thus, in many cases data on numbers have been pre-aggregated at source, and there is no means to disaggregate according to specific colonies without going back to the original data and authors. Where possible, the presence and location of colonies were verified against publicly available satellite imagery, for example using online tools such as Google Earth and Wikimapia (http://wikimapia.org). However, the quality of available imagery is highly variable, and it was not feasible to make an independent evaluation of every site within this study and in most cases the data used are those available from the source.

Where specific colony boundaries are unknown, it has been assumed that the colony may be breeding on any part of the ice-free land available at the locality where they have been reported (with the exception of Emperor Penguins, all Antarctic birds require ice-free land on which to breed). In addition, in many cases the mapping of sites is poor and the specific location of an outcrop or small island on which birds are breeding is poorly described or uncharted. In these cases the location has to be estimated from available evidence, such as from reports, descriptions, maps and satellite images.

In view of these difficulties, there was a need to define criteria for estimating the breeding area of colonies, and hence the boundary of the IBA.

Table 1: Bird species of Antarctica included in this assessment and associated population thresholds required for IBA designation[2]

Name	Latin Name	Red List Status	IBA Criteria	Pop Threshold (pairs)[3]	Global Population (individuals)	Global Population (pairs)	Source
Emperor Penguin	*Aptenodytes forsteri*	NT	A1, A4ii	2380		238 000	Fretwell *et al*. 2012
Gentoo Penguin	*Pygoscelis papua*	NT	A1, A4ii	3900		387 000	Lynch 2012
Adélie Penguin	*Pygoscelis adeliae*	NT	A1, A4ii	37 900		3 790 000	Lynch & La Rue 2014
Chinstrap Penguin	*Pygoscelis antarctica*	LC	A4ii	27 000	8,000,000	~2 666 667	World Bird Database, BirdLife Int.
Macaroni Penguin	*Eudyptes chrysolophus*	VU	A1, A4ii	1500 (A1) 63 000 (A4ii)		6 300 000	Crossin *et al.* 2013
Wilson's Storm-petrel	*Oceanites oceanicus*	LC	A4ii	70 000	12-30 000 000	~4-10 000 000	Brooke 2004
Black-bellied Storm-petrel	*Fregetta tropica*	LC	A4ii	1600	500 000	~160 000	Brooke 2004
Light-mantled Albatross	*Phoebetria palpebrata*	NT	A1, A4ii	10 (A1), 200 (A4ii)	87 000	~20 000	ACAP 2010a
Southern Giant Petrel	*Macronectes giganteus*	LC	A4ii	500		~50 000	ACAP 2010b
Southern Fulmar	*Fulmarus glacialoides*	LC	A4ii	10 000	1 000 000	1 000 000	Creuwels *el al*. 2007
Antarctic Petrel	*Thalassoica antarctica*	LC	A4ii	30 000	10-20 000 000	~ 3 – 7 000 000	Brooke 2004
Cape Petrel	*Daption capense*	LC	A4ii	6700	2 000 000	~670 000	Brooke 2004
Snow Petrel	*Pagodroma nivea*	LC	A4ii	13 000	4,000,000	~1 300 000	Brooke 2004

[2] Table 1 has been updated to reflect data published since the IBA assessment was completed for the Antarctic Peninsula (Harris *et al*. 2011). Where available data were based on estimated number of individuals, in order to take into account juveniles in the population, this has been divided by three to give mature pairs.

[3] In some cases the same species may trigger more than one IBA criterion, for which the appropriate population thresholds may differ. Thus, the threshold for triggering IBA selection for a globally threatened species under criterion A1 may be lower than the threshold for the same species under category A4. Where A1 and A4 thresholds are identical the number given applies to both. The threshold of 10 000 pairs for category A4iii may be made up of one or more species.

Name	Latin Name	Red List Status	IBA Criteria	Pop Threshold (pairs)[3]	Global Population (individuals)	Global Population (pairs)	Source
Antarctic Prion	*Pachyptila desolata*	LC	A4ii	166 000	50 000 000	~16 600 000	Brooke 2004
Imperial (Antarctic) Shag	*Phalacrocorax* [*atriceps*] *bransfieldensis*	LC	A4i	133	40 000	~13333	Waterbirds Population Estimates IV - *bransfieldensis* treated as a subsp of *atriceps*
Snowy (Greater) Sheathbill	*Chionis albus*	LC	A4ii	100	10 000	10 000	Handbook of the Birds of the World
Kelp Gull	*Larus dominicanus*	LC	A4i	140	30 – 60 000	~10-20 000	Waterbirds Population Estimates V [Antarctic Peninsula & Atlantic sub-Antarctic Islands]
Antarctic Tern	*Sterna vittata*	LC	A4i	366	110 000	~36 666	Waterbirds Population Estimates III [*S. v. gaini* Antarctic Peninsula and S Shetland Islands?]
South Polar Skua	*Catharacta maccormicki*	LC	A4ii	50	10 000-19 999	~3000-7500	World Bird Database, BirdLife Int.
Brown Skua	*Catharacta antarctica*	LC	A4ii	75	10 000-19 999	~3000-7500	World Bird Database, BirdLife Int.
Seabirds (including all species of penguin, procellariiform, sheathbill and skua)			A4iii	10 000	N/A	N/A	
Waterbirds (including all species of shag, gull and tern)			A4iii	10 000	N/A	N/A	

Criteria for defining the IBA boundary

Having identified IBAs based on population criteria, further criteria are needed to define the spatial extent of the IBA boundary. Particular rules were defined for IBAs that coincide with existing protected areas because these are distinct, legally agreed areas that have management plans to regulate activities within their boundaries. In the case of Antarctic Specially Protected Areas (ASPAs), permits are required for entry. In most cases where an IBA has been identified within an ASPA, the site has been desginated at least in part because of its ornithological values.

If the IBA occurs within an Antarctic Specially Protected Area (ASPA):

1. The boundary of the ASPA is used to define the IBA boundary.

If the IBA occurs within an Antarctic Specially Managed Area (ASMA):

1. Where the IBA occurs within a management zone designated by the ASMA, the boundary of the management zone is used to define the IBA boundary. For example, a number of Restricted Zones within ASMA No. 7 Palmer Basin and SW Anvers Island are identified as IBAs and the zone boundaries are used to define the IBA boundary.
2. Where the IBA occurs on distinct islands and one or more islands are contained within designated management zones, the IBA boundary is defined by the boundary of the management zones joined using the shortest practical perimeter.

If the IBA occurs outside of an ASPA or management zone within an ASMA:

1. Where data for birds triggering an IBA have been pre-aggregated over distinct islands, ice-free areas or a combination of ice-free areas and offshore islands and rocks, covering a total land area of >5 km^2, the IBA boundary is drawn using the shortest perimeter such that all land areas over which data are aggregated are incorporated into the IBA, adjusting the perimeter where appropriate so that it is follows the land coastline and/or limit of the ice-free areas where these features fall inside the area bounded by the shortest perimeter.
2. Where a breeding site triggering an IBA is located on a feature not present in the SCAR Antarctic Digital Database (v 6.0) base map, where practical an approximation of that feature was digitised onto the map from satellite imagery, and where this was not possible a circular limit with a 1.26 km radius around the point marking the breeding site centroid is used to define the IBA boundary (i.e. 5 km^2);
3. Where birds triggering an IBA are known or thought to breed on an island of ≤5 km^2, the island coastline is used to define the IBA boundary;
4. Where birds triggering an IBA are known or thought to breed on distinct islands within an island group and the island group covers a land area of ≤5 km^2, the IBA boundary is drawn using the shortest perimeter such that all islands within the group are incorporated into the IBA, adjusting the perimeter where appropriate so that it follows the island coastline. Note: where birds triggering an IBA breed both within an island group and on land outside of the island group, and the total land area for the island group + outside islands containing breeding birds covers ≤5 km^2, the island group and the islands containing breeding birds outside the island group will be included in the IBA;
5. Where birds triggering an IBA are known or thought to breed on distinct ice-free areas with a contained geographic area and the ice-free areas covers a land area of ≤5 km^2, the IBA boundary is drawn using the shortest perimeter such that all ice-free areas on which birds breed are incorporated into the IBA, adjusting the perimeter where appropriate so that it follows the coastline or limit of an ice-free area;
6. Where an IBA centroid is located on an ice-covered area on an island or other landmass that is >5 km^2, the limit of a 1.26 km radius around the IBA centroid, clipped to both the land coastline and the limit of the ice-free area, is used to define the IBA boundary.
7. Where two or more IBAs identified by the source data were less than 500 m in distance apart, these sites were assigned to belong within a single IBA comprising all sites.

It is recognised that the criteria used can result in clusters of IBAs within 'close' proximity. It would be entirely possible to vary the minimum separation distance between IBAs to obtain an alternative result, for example by merging those sites that are less than 1 km, or perhaps 10 or 20 km apart. Clearly, this would result in fewer, although larger IBAs. It is acknowledged that the 500 m threshold used for merging sites is arbitrary. The approach taken seeks to preserve, as far as practicable, the results offered given the resolution of the source data, and to minimise merging. However, where two or more IBAs had been identified less than 500 m apart, there seemed little practical benefit to defining

the sites separately. Practical management of the sites, should it be required, would most likely need to consider such adjacent sites as a unit. We have attempted to represent the source data as faithfully as possible, while being pragmatic, although it is recognised that other minimum separation distances could be used.

If evidence emerges that supports the case to group identified IBAs into larger units based on alternative criteria, then the analysis could be re-run to reflect the best scientific case for appropriate spatial units. For example, evidence for merging IBAs may appear from new studies being conducted on the genetic similarities of spatially distributed populations of the same species (T. Hart pers. comm. 2011), and further studies on foraging ranges and identified feeding grounds out to sea, as opposed to concentrating on breeding localities, may inform alternative spatial configurations for Antarctic IBAs in the future. For the moment, however, there remains insufficient data on which to base such alternative configurations across the whole of the Antarctic, and there is a need for further research before a practical set of IBAs boundaries could be defined that take such factors into account.

It should be noted that Emperor Penguins are less philopatric than land-breeding Antarctic birds, as their breeding areas are dependent on sea-ice conditions in a given season, and may also be affected by major events such as glacier calving, ice shelf cracking, or the movement of large icebergs, which can substantially alter customary breeding sites. Thus, while the birds return to the same general areas to breed, these may vary by several to dozens of km over time. Moreover, the size and position of breeding areas often vary throughout the season, and these may sub-divide into a number of sub-colonies. However, available data show that colonies tend to re-occupy the same general locations on a regular basis, and as such their presence at the sites identified is reasonably predictable. The spatial representation of IBAs for Emperor Penguin breeding sites is intended as an approximation based on available data, and it is recognised that actual breeding sites will vary in both size and position from year to year and within any given season.

Limitations in data sources

Recent assessments for several species using remote sensing (e.g. Barber-Meyer *et al*. 2007; Fretwell *et al*. 2012; Schwaller *et al*. 2013; Lynch & LaRue 2014; Lynch & Schwaller 2014) offer a more complete, recent and synoptic view of the status of Antarctic bird populations, in particular for penguins. Numerous colonies previously unknown have been identified, some of which appear to comprise tens of thousands of breeding pairs. These studies have significantly expanded our knowledge of the abundance and distribution of penguins, and this helps inform our view of their conservation status. However, it should be noted that these techniques are relatively new, and results remain subject to considerable margins of error compared to traditional nest counts made on the ground. Despite the weaknesses apparent in the techniques, remote sensing remains the only practical means to gather data on a synoptic scale for so many remote colonies, many of which are rarely, if ever, visited. In addition, remote sensing resolution, image quality and processing techniques are improving rapidly, and it is anticipated that results will continue to become more reliable. The technique offers great promise to become an increasingly important monitoring tool for several penguin species. For these reasons, recent remote sensing studies have been utilised extensively in the IBA assessment, and in some cases these are the only data available. However, the potential for considerable error to be present in results from remote sensing is acknowledged. Therefore, where specific Confidence Intervals (CIs) are available in the published sources, these have been presented along with the mean population count.

In general, counts presented in this report have been drawn direct from original sources. In some cases numbers in these sources are given to a precision down to an individual bird (e.g. 5001, as opposed to ~5000), giving a false impression of the degree of accuracy that actually exists in the source data. In this report, numbers have been quoted as they appear without rounding, although it is acknowledged that these source data generally do not possess accuracies to the individual bird. This practice has been adopted to provide an 'audit trail' so that readers can return to original sources and make comparisons should they wish. We have found in compiling this report that this is often helpful to trace the origin of a particular observation, and to identify errors.

Counts presented in this report are generally given as the number of breeding pairs. One exception to this rule has been made for Emperor Penguin counts given in the study by Fretwell *et al*. (2012), who reported estimates of the number of birds present at the time of image acquisition. Imagery used in this study was mostly acquired late in the breeding season (Oct / Nov), at a time when many adults have departed and chicks remaining have light grey plumage that is difficult to detect against the ice background. As a result, chicks at this time are almost invisible on satellite

images at current resolutions, and adults in evidence (which are likely to comprise both males and females) are not a particularly reliable indicator of the size of the breeding population that was present earlier in the season (B. Wienecke pers. comm. 2015). Thus, we have reported the number of birds in accordance with the data presented in Fretwell *et al*. (2012), but have not presented these as 'breeding pairs'. However, in order to determine whether a site met the threshold of 2380 pairs (Table 1) to qualify as an IBA, the total number of birds given in Fretwell *et al*. (2012) was assumed to provide a rough estimate of a minimum number of breeding pairs. In practice, it is highly likely these are underestimates of the breeding populations at these sites for reasons given above, although for the purposes of identifying whether or not the site qualifies as an IBA, this is currently the best estimate possible when using the Fretwell *et al*. (2012) results. Because this is likely to be an underestimate, improved data would be likely to reaffirm rather than refute IBA status, although it is recognised that considerable uncertainty remains over these results.

In this report the most reliable and recent counts available have been used for the purposes of determining whether a site meets IBA criteria. Where several recent counts were available, for example from a ground count and from satellite image analysis, both are presented. Where practicable, example historical data are also presented to provide a better context against which to interpret the recent census results. In many cases, the only counts available are those for a single year, and it is recognised that samples of this nature are subject to error because of the inter-annual fluctuations in Antarctic bird breeding populations. In some studies, a mean colony count over a number of years has been made, although this is the exception rather than the rule. For example, Lyver *et al.* (2014) calculated mean counts for Adélie Penguin colonies in the Ross Sea over the periods for which census data were available, which varies by colony. In other publications (e.g. Woehler 1993), census data originate from particular breeding seasons, reflecting the size of colonies at particular points in time. Averaging census data offers the benefit of taking into account the natural population fluctuations between years, and these results have been used where available in the current assessment. However, where numbers are following a trend of increase or decline, the mean population may mask the current status of a site. Some examples of where this is apparent have been noted in the report.

Review and comment on initial results

The initial draft list of IBAs prepared by SCAR in 2002 was compiled from data available at the time and through expert judgement and a consultation process that involved several international workshops. The present analysis extended this initial assessment by including more recent data and by undertaking a formal spatial analysis of the data to identify IBA boundaries. In some cases, where time allowed, queries were raised with individual authors and / or data contributors to resolve ambiguities in published data, for example over the existence, location or size of many colonies. In addition, over the course of the present assessment drafts were distributed to a wide range of Antarctic bird experts for review and comment with a view to identifying errors and omissions. Numerous helpful comments were received and these have resulted in corrections and adjustments to both published and unpublished data, sometimes allowing for finer analysis than would otherwise be possible using the published sources, especially where source data had been spatially aggregated. Instances where this occurs have been identified in the report as 'unpublished data' and / or by 'Contributor, pers. comm., Year'. While perhaps ideally more of this should be done, there were limits to the time and budget available for the current study, and this constrained the extent to which the authors could further investigate and verify data in original sources for every site. Several sites identified in Harris *et al*. (2011) were found no longer to qualify and are shown as 'de-listed'.

Results

The results of the analysis confirmed 204 sites in the region meet the IBA designation criteria, as listed in Table 2. Site locations are illustrated in Maps 1 - 8. Map 1 provides an overview of the distribution of IBAs across Antarctica, while Maps 2-8 provide more detailed regional overviews. Site descriptions, summaries of the bird data on which the assessment was made, and site maps showing colony locations are provided in the IBA Site Accounts.

Of the IBAs that coincide with ASPAs (Table 2), 27 lie within those ASPAs that have been designated for values mainly or at least in part related to avifauna, three encompass or coincide with ASPAs protected for reasons other than avifauna, such as historic or terrestrial values, while a further three lie on the boundary of a marine ASPA. Two sites that no longer qualify as IBAs are designated ASPAs. Nine IBAs lie within three ASMAs (Table 2).

Table 2: List of breeding site IBAs in Antarctica.

IBA No.	Location	Trigger species (IBA criteria)	Former IBA No. (2011)	ASPA No.	ASMA No.	Comment
001	Larsen Is / Moreton Point	Chinstrap Penguin (A4ii), Seabirds – Chinstrap Penguin (A4iii)	100			
002	Gibbon Bay, Coronation Island	Seabirds – Chinstrap Penguin (A4iii)	096			
003	Eillium Island	Seabirds – Chinstrap Penguin (A4iii)	083			
004	Weddell Islands	Seabirds – Adélie Penguin (A4iii)				
005	Pirie Peninsula, Laurie Island	Imperial Shag (A4i) Seabirds – Chinstrap Penguin (A4iii)	085			
006	Ferguslie Peninsula, Laurie Island	Seabirds – Chinstrap Penguin (A4iii)	086			
007	Watson Peninsula, Laurie Island	Seabirds – Chinstrap Penguin (A4iii)	087			
008	Fraser Point, Laurie Island	Seabirds – Chinstrap Penguin (A4iii)	088			
009	Buchanan Point, Laurie Island	Seabirds – Chinstrap Penguin (A4iii)	089			
010	Ferrier Peninsula / Graptolite Island, Laurie Island	Adélie Penguin (A1, A4ii) Seabirds – Adélie Penguin (A4iii)	090			
011	Cape Whitson, Laurie Island	Seabirds – Chinstrap Penguin (A4iii)	080			
012	Point Martin, Laurie Island	Seabirds – Adélie Penguin, Chinstrap Penguin (A4iii)	081			
013	Islet SW of Cape Davidson, Laurie Island	Imperial Shag (A4i)	082			
014	Cape Robertson, Laurie Island	Seabirds – Chinstrap Penguin (A4iii)	084			
015	Southern Powell Island and adjacent islands	Gentoo Penguin (A1, A4ii) Chinstrap Penguin (A4ii) Imperial Shag (A4i) Southern Giant Petrel (A4ii) Seabirds – Chinstrap Penguin (A4iii)	093	111		
016	Atriceps Island, Robertson Islands	Imperial Shag (A4i)	091			
017	Robertson Islands	Chinstrap Penguin (A4ii) Seabirds – Chinstrap Penguin (A4iii)	092			
018	Shingle Cove, Coronation Island	Seabirds – Adélie Penguin (A4iii)	097			
019	Signy Island	Imperial Shag (A4i) Southern Giant Petrel (A4ii) Wilson's Storm-petrel (A4ii) Brown Skua (A4ii)	095			

IBA No.	Location	Trigger species (IBA criteria)	Former IBA No. (2011)	ASPA No.	ASMA No.	Comment
		Seabirds – Adélie, Chinstrap Penguin, Wilson's Storm-petrel, Southern Fulmar (A4iii)				
020	Moe Island	Seabirds – Chinstrap Penguin (A4iii)	094	109		
021	Gosling Islands	Seabirds – Chinstrap Penguin (A4iii)	098			
022	Return Point / Cheal Point, Coronation Island	Chinstrap Penguin (A4ii) Seabirds – Chinstrap Penguin (A4iii)	099			
023	Inaccessible Islands	Southern Fulmar (A4ii) Seabirds – Southern Fulmar (A4iii)	101			
024	Sugarloaf Island, Clarence Island	Chinstrap Penguin (A4ii) Seabirds – Chinstrap Penguin (A4iii)	079			
025	Cape Bowles, Clarence Island	Chinstrap Penguin (A4ii) Seabirds – Chinstrap Penguin (A4iii)	076			
026	Craggy Point, Clarence Island	Macaroni Penguin (A1) Southern Fulmar (A4ii) Seabirds – Chinstrap Penguin, Southern Fulmar (A4iii)	077			
027	Chinstrap Cove, Clarence Island	Seabirds – Chinstrap Penguin (A4iii)	078			
028	Seal Islands	Seabirds – Chinstrap Penguin (A4iii)	075			
029	Saddleback Point, Elephant Island	Seabirds – Chinstrap Penguin (A4iii)	072			
030	Point W of Walker Point, Elephant Island	Seabirds – Chinstrap Penguin (A4iii)	073			
031	Mount Elder, Elephant Island	Seabirds – Chinstrap Penguin (A4iii)	074			
032	Point W of Cape Lookout, Elephant Island	Seabirds – Chinstrap Penguin (A4iii)	070			
033	Stinker Point, Elephant Island	Seabirds – Chinstrap Penguin (A4iii)	071			
034	Gibbs Island	Macaroni Penguin (A1) Chinstrap Penguin (A4ii) Southern Fulmar (A4ii) Seabirds – Chinstrap Penguin (A4iii)	069			
035	Aspland Island / Eadie Island	Southern Fulmar (A4ii) Seabirds – Southern Fulmar, Chinstrap Penguin (A4iii)	067			
036	O'Brien Island	Seabirds – Chinstrap Penguin (A4iii)	068			
	Stigant Point, King George Island	Seabirds – Chinstrap Penguin (A4iii)	054			delisted

IBA No.	Location	Trigger species (IBA criteria)	Former IBA No. (2011)	ASPA No.	ASMA No.	Comment
037	Eastern Litwin Bay, King George Island	Seabirds – Chinstrap Penguin (A4iii)	055			
038	Tartar Island, King George Island	Seabirds – Chinstrap Penguin (A4iii)	056			
039	Kellick Island, King George Island	Seabirds – Chinstrap Penguin (A4iii)	057			
040	Owen Island, King George Island	Seabirds – Chinstrap Penguin (A4iii)	058			
041	Pottinger Point, King George Island	Chinstrap Penguin (A4ii) Seabirds – Chinstrap Penguin (A4iii)	059			
042	False Round Point, King George Island	Chinstrap Penguin (A4ii) Seabirds – Chinstrap Penguin (A4iii)	060			
043	Milosz Point / Czeslaw Point, King George Island	Seabirds – Chinstrap Penguin (A4iii)	061			
044	North Foreland, King George Island	Seabirds – Chinstrap Penguin (A4iii)	062			
	Cape Melville, King George Island	Seabirds – Chinstrap Penguin (A4iii)	063			delisted
	Penguin Island, King George Island	Southern Giant Petrel (A4ii) Seabirds – Adélie & Chinstrap Penguin (A4iii)	064			delisted
	Lions Rump, King George Island	Seabirds – Adélie Penguin (A4iii)	065	151		delisted
045	Point Hennequin, King George Island	South Polar Skua (A4ii)			001	
046	West Admiralty Bay, King George Island	Gentoo Penguin (A1, A4ii) Seabirds – Adélie, Chinstrap & Gentoo Penguin (A4iii)	066	128	001	
047	Potter Peninsula, King George Island	South Polar Skua (A4ii)	052	132		
048	Ardley Island, King George Island	Gentoo Penguin (A1, A4ii)	053	150		
049	Harmony Point, Nelson Island	Chinstrap Penguin (A4ii) Snowy sheathbill (A4ii) Seabirds – Chinstrap Penguin (A4iii)	051	133		
050	Heywood Island	Chinstrap Penguin (A4ii) Seabirds – Chinstrap Penguin (A4iii)	050			
051	Yankee Harbour, Greenwich Island	Gentoo Penguin (A1, A4ii)	049			
052	Half Moon Island	South Polar Skua (A4ii)	048			
053	Barnard Point, Livingston Island	Seabirds – Chinstrap Penguin (A4iii)	047			
054	Byers Peninsula, Livingston Island	Antarctic tern (A4i) Kelp Gull (A4i)	045	126		

IBA No.	Location	Trigger species (IBA criteria)	Former IBA No. (2011)	ASPA No.	ASMA No.	Comment
	Cape Shirreff, Livingston Island	Seabirds – Chinstrap Penguin (A4iii)	046	149		delisted
055	Baily Head, Deception Island	Chinstrap Penguin (A4ii) Seabirds – Chinstrap Penguin (A4iii)	044		004	
056	Vapour Col, Deception Island	Seabirds – Chinstrap Penguin (A4iii)	043		004	
057	Cape Wallace, Low Island	Chinstrap Penguin (A4ii) Seabirds – Chinstrap Penguin (A4iii)	041			ASPA 152 protects adjacent marine area
058	Cape Hooker, Low Island	Seabirds – Chinstrap Penguin (A4iii)	042			
059	Cape Garry, Low Island	Chinstrap Penguin (A4ii) Seabirds – Chinstrap Penguin (A4iii)	039			ASPA 152 protects adjacent marine area
060	Jameson Point, Low Island	Seabirds – Chinstrap Penguin (A4iii)	040			ASPA 152 protects adjacent marine area
061	Ambush Bay, Joinville Island	Seabirds – Adélie Penguin (A4iii)				
062	Danger Islands	Adélie Penguin (A1, A4ii) Seabirds – Adélie Penguin (A4iii)	036			
063	Brash Island, Danger Islands	*Pygoscelis* Penguin (A1(?), A4ii) Seabirds – *Pygoscelis* Penguin (A4iii)				
064	Earle Island, Danger Islands	Seabirds – *Pygoscelis* Penguin (A4iii)				
065	Eden Rocks	Adélie Penguin (A1, A4ii) Seabirds – Adélie Penguin (A4iii)	035			
066	Paulet Island	Adélie Penguin (A1, A4ii) Imperial Shag (A4i) Seabirds - Adélie Penguin (A4iii)	034			
067	D'Urville Monument, Joinville Island	Seabirds – Adélie Penguin (A4iii)	037			
068	Madder Cliffs, Joinville Island	Seabirds – Adélie Penguin (A4iii)	038			
069	Snow Hill Island	Emperor Penguin (A1, A4ii)	030			
070	Penguin Point, Seymour Island	Seabirds – Adélie Penguin (A4iii)	031			
071	Cockburn Island	Imperial Shag (A4i) Seabirds – Adélie Penguin (A4iii)	032			
072	Devil Island	Seabirds – Adélie Penguin (A4iii)	033			
073	Brown Bluff	Seabirds – Adélie Penguin (A4iii)	029			
074	Hope Bay	Adélie Penguin (A1, A4ii) Seabirds – Adélie Penguin (A4iii)	028			
075	Gourdin Island	Seabirds – Adélie Penguin (A4iii)	027			

IBA No.	Location	Trigger species (IBA criteria)	Former IBA No. (2011)	ASPA No.	ASMA No.	Comment
076	Duroch Islands	Seabirds – Adélie, Chinstrap & Gentoo Penguins (A4iii)	026			
077	Tupinier Islands	Seabirds – Chinstrap Penguin (A4iii)	025			
078	Pearl Rocks	Imperial Shag (A4i)	024			
079	Cape Wollaston, Trinity Island	Southern Fulmar (A4ii) Seabirds – Southern Fulmar (A4iii)	023			
080	SW Trinity Island	Imperial Shag (A4i)	022			
081	Cierva Point & offshore islands	South Polar Skua (A4ii)	021	134		
082	Bluff Island	Imperial Shag (A4i)	020			
083	Cuverville Island	Gentoo Penguin (A1, A4ii)	018			
084	Islet E of Guépratte Island	Imperial Shag (A4i)	019			
	Pursuit Point	Imperial Shag (A4i)	011			delisted
085	Cormorant Island	Imperial Shag (A4i)	012		007	
	Arthur Harbor North	Seabirds – Adélie Penguin (A4iii)	013		007	delisted
086	Litchfield Island	South Polar Skua (A4ii)	014	113	007	
087	Joubin Islands	Imperial Shag (A4i)	015		007	
	Dream Island	Seabirds – Adélie Penguin (A4iii)	016		007	delisted
088	Islet S of Gerlache Island	Gentoo Penguin (A1, A4ii)	017		007	
089	Petermann Island	Gentoo Penguin (A1, A4ii)	010			
090	Uruguay Island	Imperial Shag (A4i)	009			
091	Islet S of Bates Island	Imperial Shag (A4i)	008			
092	Island N of Dodman Island	Imperial Shag (A4i)	006			
093	Armstrong Reef	Imperial Shag (A4i)	007			
094	Cape Evensen	Imperial Shag (A4i)	005			
095	Avian Island	Adélie Penguin (A1, A4ii) Imperial Shag (A4i) South Polar Skua (A4ii) Seabirds – Adélie Penguin (A4iii)	003	117		
096	Ginger Islands	Imperial Shag (A4i)	004			
097	Emperor Island, Dion Islands	Imperial Shag (A4i)	002	107		
098	Lagotellerie Island	Imperial Shag (A4i)		115		
099	Stonington Island	Imperial Shag (A4i)	001			

IBA No.	Location	Trigger species (IBA criteria)	Former IBA No. (2011)	ASPA No.	ASMA No.	Comment
100	Smith Peninsula	Emperor Penguin (A1, A4ii)				
101	NW Berkner Island (Gould Bay)	Emperor Penguin (A1, A4ii)				
102	Coalseam Cliffs / Mount Faraway	Seabirds – Antarctic Petrel (A4iii)				
103	Luitpold Coast	Emperor Penguin (A1, A4ii)				
104	Dawson-Lambton Glacier	Emperor Penguin (A1, A4ii)				
105	Brunt Ice Shelf ('Halley Bay')	Emperor Penguin (A1, A4ii) Seabirds – Emperor Penguin (A4iii)				
106	Stancomb-Wills Glacier	Emperor Penguin (A1, A4ii)				
107	'Drescher Inlet' (Dreschereisfrontkerbe)	Emperor Penguin (A1, A4ii)				
108	Riiser-Larsen Ice Shelf	Emperor Penguin (A1, A4ii)				
109	Atka Iceport	Emperor Penguin (A1, A4ii)				
110	Muskegbukta	Emperor Penguin (A1, A4ii)				
111	Jutulsessen Mountain	Antarctic Petrel (A4ii) Seabirds – Antarctic Petrel (A4iii)				
112	Svarthamaren	Antarctic Petrel (A4ii) South Polar Skua (A4ii) Seabirds – Antarctic Petrel (A4iii)		142		
113	Gruber Mountains	Seabirds – Snow Petrel (A4iii)				
114	Princess Ragnhild Coast	Emperor Penguin (A1, A4ii)				
115	Riiser-Larsen Peninsula	Emperor Penguin (A1, A4ii)				
116	Mount Biscoe	Seabirds – Adélie Penguin (A4iii)				
117	Cape Batterbee	Seabirds – Adélie Penguin (A4iii)				
118	Kloa Point	Emperor Penguin (A1, A4ii)				
119	Taylor Rookery	Emperor Penguin (A1, A4ii)		101		
120	Gibbney Island	Seabirds – Adélie Penguin (A4iii)				
121	Rookery Islands	Adélie Penguin (A1, A4ii) Seabirds – Adélie Penguin (A4iii)		102		
122	Klung Island / Welch Island	Seabirds – Adélie Penguin (A4iii)				
123	Andersen Island	Seabirds – Adélie Penguin (A4iii)				
124	Kirton Island / Macklin Island	Seabirds – Adélie Penguin (A4iii)				
125	Auster Rookery	Emperor Penguin (A1, A4ii)				
126	Scullin Monolith / Murray Monolith	Adélie Penguin (A1, A4ii)		164		

IBA No.	Location	Trigger species (IBA criteria)	Former IBA No. (2011)	ASPA No.	ASMA No.	Comment
		Antarctic Petrel (A4ii) Seabirds – Antarctic Petrel (A4iii)				
127	Cape Darnley	Emperor Penguin (A1, A4ii)				
128	Amanda Bay	Emperor Penguin (A1, A4ii)		169		
129	Caro Island, Rauer Islands	Seabirds – Adélie Penguin (A4iii)				
130	Hop Island, Rauer Islands	Adélie Penguin (A1, A4ii) Seabirds – Adélie Penguin (A4iii)				
131	Filla Island, Rauer Islands	Seabirds – Adélie Penguin (A4iii)				
132	Kazak Island / Zolotov Island	Seabirds – Adélie Penguin (A4iii)				
133	Unnamed island at Donskiye Islands	Seabirds – Adélie Penguin (A4iii)				
134	Warriner Island, Donskiye Islands	Seabirds – Adélie Penguin (A4iii)				
135	Gardner Island	Seabirds – Adélie Penguin (A4iii)				
136	Magnetic Island and nearby islands	Seabirds – Adélie Penguin (A4iii)				
137	Lucas Island	Seabirds – Adélie Penguin (A4iii)				
138	Rookery Lake / W Long Peninsula	Adélie Penguin (A1, A4ii) Seabirds – Adélie Penguin (A4iii)				
139	Tryne Islands	Seabirds – Adélie Penguin (A4iii)				
140	West Ice Shelf	Emperor Penguin (A1, A4ii)				
141	Haswell Island	Emperor Penguin (A1, A4ii) South Polar Skua (A4ii) Seabirds – Adélie Penguin (A4iii)		127		
142	Shackleton Ice Shelf	Emperor Penguin (A1, A4ii)				
143	Peterson Island	Seabirds – Adélie Penguin (A4iii)				
144	Holl Island / O'Connor Island	Seabirds – Adélie Penguin (A4iii)				
145	Ardery Island / Odbert Island	Seabirds – Adélie Penguin, Southern Fulmar (A4iii)		103		
146	Shirley Island / Beall Island	Seabirds – Adélie Penguin (A4iii)				
147	Clark Peninsula	Seabirds – Adélie Penguin (A4iii)		136		
148	Berkley Island / Cameron Island	Seabirds – Adélie Penguin (A4iii)				
149	Dibble Glacier	Emperor Penguin (A1, A4ii) Seabirds – Emperor Penguin (A4iii)				
150	Pointe Géologie	Emperor Penguin (A1, A4ii)		120		

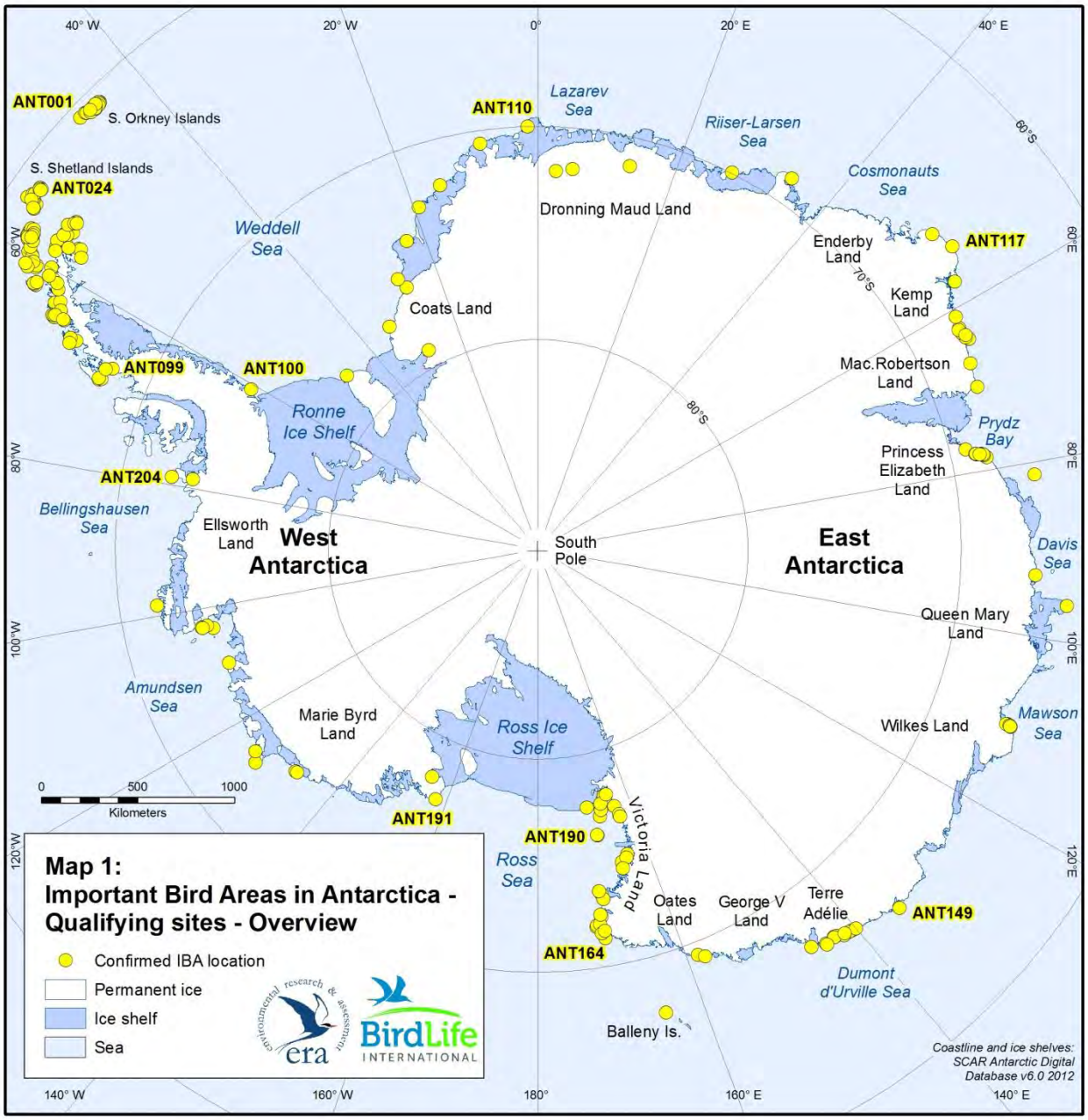
IBA No.	Location	Trigger species (IBA criteria)	Former IBA No. (2011)	ASPA No.	ASMA No.	Comment
		Adélie Penguin (A1, A4ii) Seabirds – Adélie Penguin (A4iii)				
151	Cape Bienvenue	Seabirds – Adélie Penguin (A4iii)				
152	Cape Jules	Adélie Penguin (A1, A4ii) Seabirds – Adélie Penguin (A4iii)				
153	Île des Manchots / Empereur Island	Seabirds – Adélie Penguin (A4iii)		166		ASPA protects historic features
154	Curzon Islands	Seabirds – Adélie Penguin (A4iii)				
155	Cape Hunter	Seabirds – Adélie Penguin, Antarctic Petrel (A4iii)				
156	MacKellar Islands	Adélie Penguin (A1, A4ii) Seabirds – Adélie Penguin (A4iii)				
157	Cape Denison	Seabirds – Adélie Penguin (A4iii)		162		ASPA protects historic features, avifauna and other environmental values
158	Way Archipelago	Adélie Penguin (A1, A4ii) Seabirds – Adélie Penguin (A4iii)				
159	Cape Pigeon Rocks	Seabirds – Adélie Penguin (A4iii)				
160	Mertz Glacier	Emperor Penguin (A1, A4ii)				
161	Kartografov Island / Mount Archer	Seabirds – Adélie Penguin (A4iii)				
162	Arthurson Ridge	Seabirds – Adélie Penguin (A4iii)				
163	Sturge Island	Southern Fulmar (A4ii) Seabirds – Southern Fulmar (A4iii)				
164	Duke of York Island	Seabirds – Adélie Penguin (A4iii)				
165	Cape Adare	Adélie Penguin (A1, A4ii) South Polar Skua (A4ii) Seabirds – Adélie Penguin (A4iii)		159		ASPA protects historic features
166	Downshire Cliffs	Seabirds – Adélie Penguin (A4iii)				
167	Possession Island	Adélie Penguin (A1, A4ii) South Polar Skua (A4ii) Seabirds – Adélie Penguin (A4iii)				
168	Foyn Island	Seabirds – Adélie Penguin (A4iii)				
169	Cape Roget	Emperor Penguin (A1, A4ii)				
170	Seabee Hook, Cape Hallett	Adélie Penguin (A1, A4ii)		106		

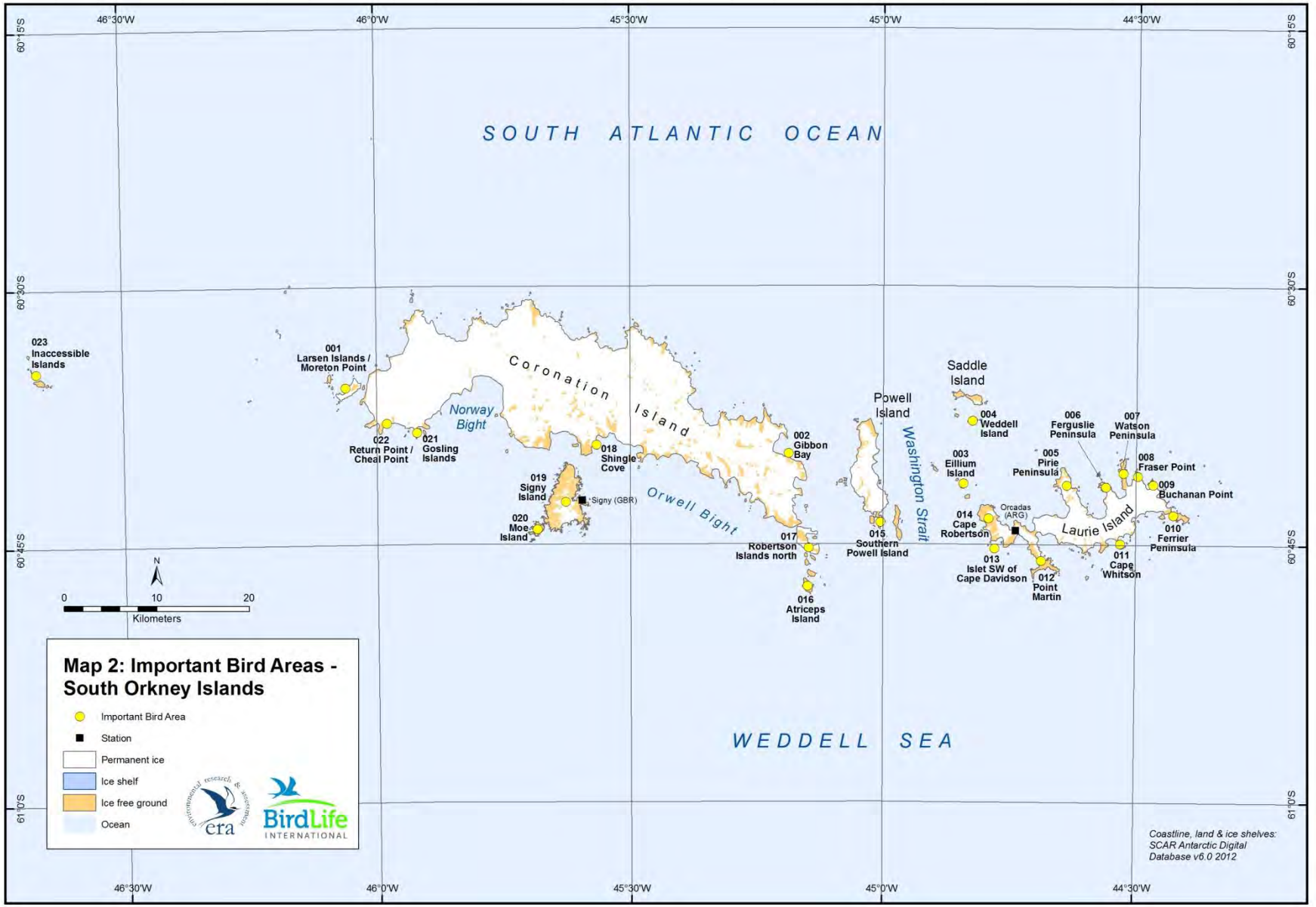
IBA No.	Location	Trigger species (IBA criteria)	Former IBA No. (2011)	ASPA No.	ASMA No.	Comment
		Seabirds – Adélie Penguin (A4iii)				
171	Cotter Cliffs	Adélie Penguin (A1, A4ii) Seabirds – Adélie Penguin (A4iii)				
172	Mandible Cirque	Seabirds – Adélie Penguin (A4iii)				
173	Cape Wadworth, Coulman Island	Emperor Penguin (A1, A4ii) Seabirds – Emperor Penguin (A4iii)				
174	Cape Main, Coulman Island	Seabirds – Adélie Penguin (A4iii)				
175	Edmonson Point	South Polar Skua (A4ii)		165		
176	Cape Washington	Emperor Penguin (A1, A4ii) South Polar Skua (A4ii) Seabirds – Emperor Penguin (A4iii)		173		
177	Adélie Cove	Seabirds – Adélie Penguin (A4iii)				
178	Inexpressible Island	South Polar Skua (A4ii) Seabirds – Adélie Penguin (A4iii)				
179	Depot Island	South Polar Skua (A4ii)				
180	Gregory Island	South Polar Skua (A4ii)				
181	Dunlop Island	South Polar Skua (A4ii)				
182	Blue Glacier to Cape Chocolate	South Polar Skua (A4ii)			002	
183	Dailey Islands	South Polar Skua (A4ii)				
184	Rocky Point, Ross Island	South Polar Skua (A4ii)				
185	Macdonald Beach, Cape Bird	South Polar Skua (A4ii), Seabirds – Adélie Penguin (A4iii)				
186	Caughley Beach, Cape Bird	Adélie Penguin (A1, A4ii) South Polar Skua (A4ii) Seabirds – Adélie Penguin (A4iii)		116		ASPA protects terrestrial ecology
187	Cape Crozier, Ross Island	Adélie Penguin (A1, A4ii) South Polar Skua (A4ii) Seabirds – Adélie Penguin (A4iii)		124		
188	Beaufort Island	Adélie Penguin (A1,A4ii) South Polar Skua (A4ii) Seabirds – Adélie Penguin (A4iii)		105		
189	Bernacchi Head, Franklin Island	Emperor Penguin (A1, A4ii)				
190	SW Franklin Island	Adélie Penguin (A1, A4ii)				

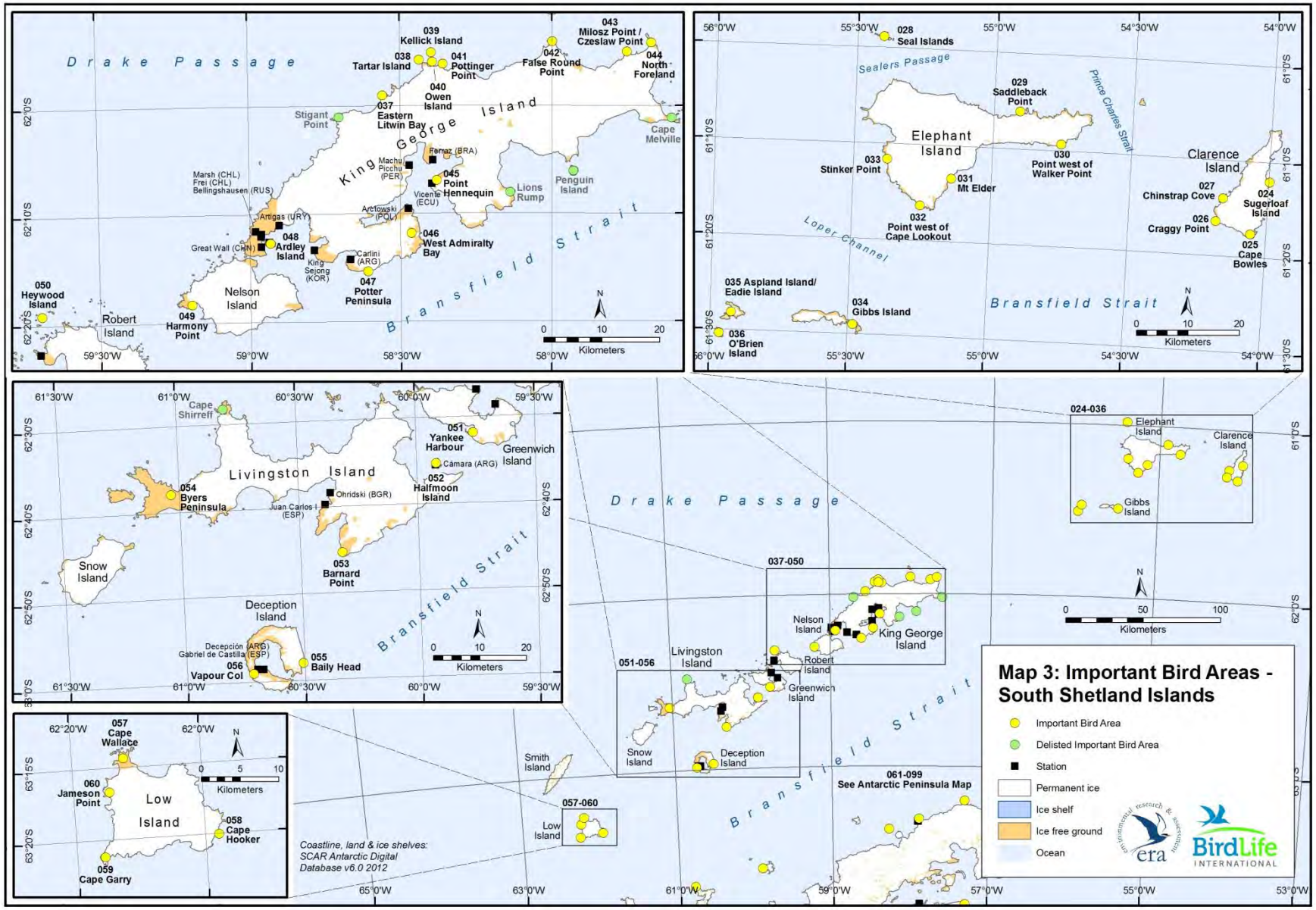
IBA No.	Location	Trigger species (IBA criteria)	Former IBA No. (2011)	ASPA No.	ASMA No.	Comment
		South Polar Skua (A4ii) Seabirds – Adélie Penguin (A4iii)				
191	Cape Colbeck	Emperor Penguin (A1, A4ii) Seabirds – Emperor Penguin (A4iii)				
192	Mount Paterson	Seabirds – Antarctic Petrel (A4iii)				
193	Worley Point, Shepard Island	Seabirds – Adélie Penguin (A4iii)				
194	Mathewson Point, Shepard Island	Seabirds – Adélie Penguin (A4iii)				
195	Maher Island	Seabirds – Adélie Penguin (A4iii)				
196	Thurston Glacier	Emperor Penguin (A1, A4ii)				
197	Hummer Point, Bear Peninsula	Emperor Penguin (A1, A4ii)				
198	Brownson Islands	Emperor Penguin (A1, A4ii) Seabirds – Adélie Penguin (A4iii)				
199	Edwards Islands	Adélie Penguin (A1, A4ii) Seabirds – Adélie Penguin (A4iii)				
200	Schaefer Islands	Seabirds – Adélie Penguin (A4iii)				
201	Lindsey Islands	Adélie Penguin (A1, A4ii) Seabirds – Adélie Penguin (A4iii)				
202	Sikorski Glacier, Noville Peninsula	Emperor Penguin (A1, A4ii)				
203	Sims Island	Seabirds – Adélie Penguin (A4iii)				
204	Scorseby Head, Smyley Island	Emperor Penguin (A1, A4ii)				

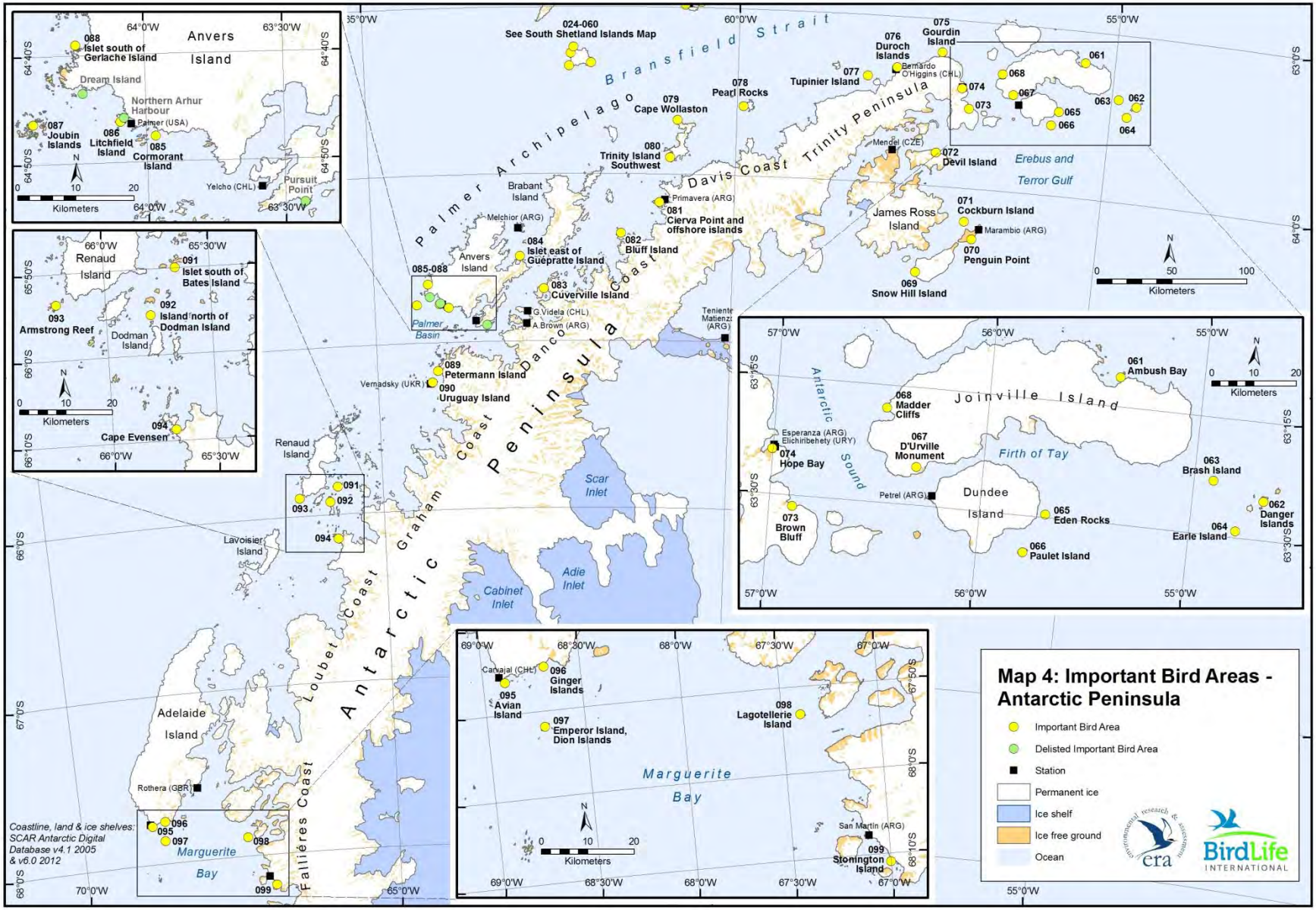
Overview and regional maps

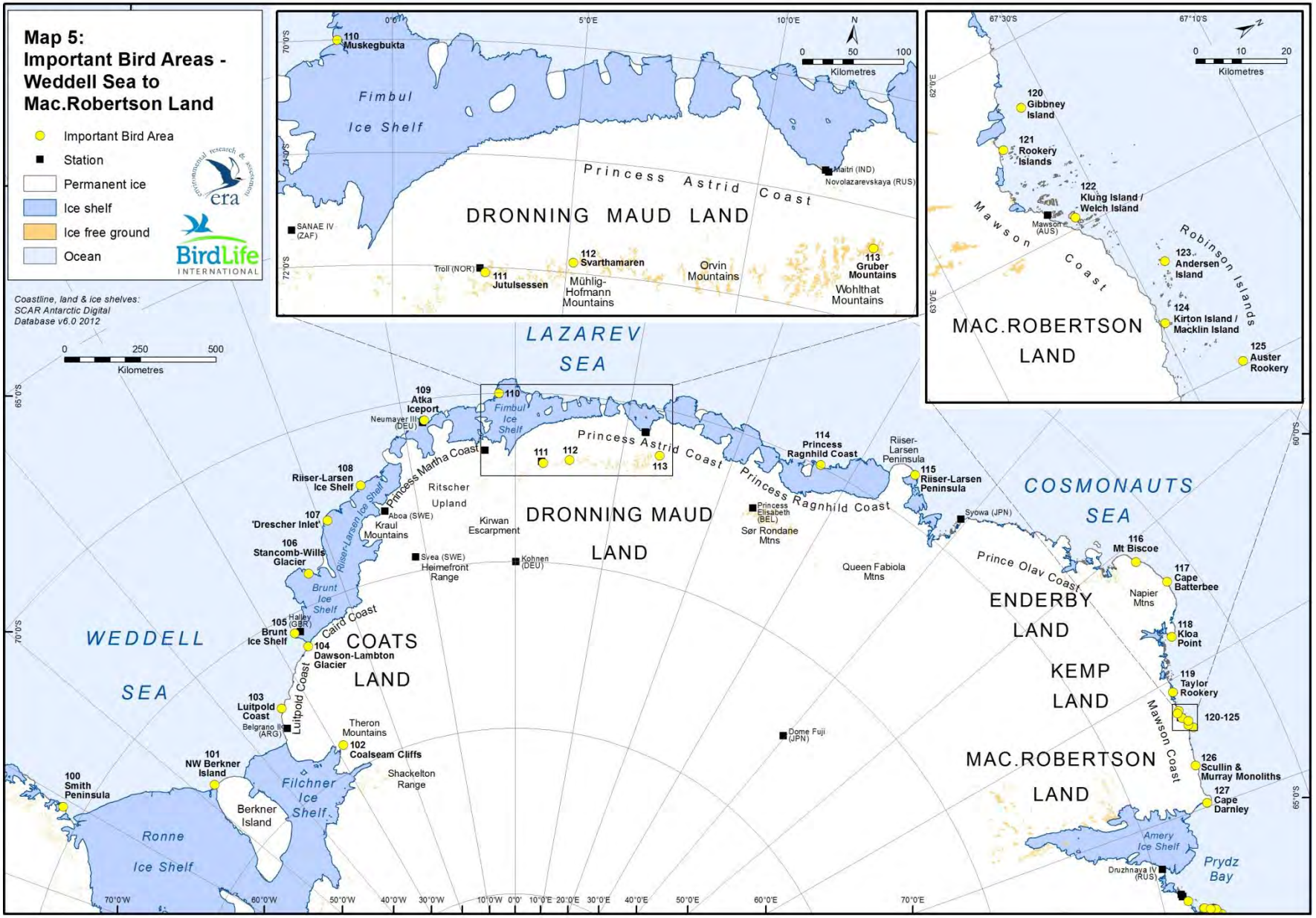
Map 1 provides an overview of Important Bird Areas (IBAs) in Antarctica identified on the basis of breeding site data against the BirdLife International / SCAR agreed criteria. The numbering system commences in the South Orkney Islands (at ANT001), proceeds southward through the South Shetland Islands and further south along the Antarctic Peninsula to Marguerite Bay, and thence from the Weddell Sea (at ANT100) in a clockwise direction around to the Bellingshausen Sea (at ANT204), with the indicative numbering shown. Following maps (Maps 2 – 8) provide more detail, illustrating the distribution of IBAs across Antarctica on a regional basis with a series of more local insets. Local maps showing the IBA boundaries are presented in the Site Accounts (not provided in Summary Report).

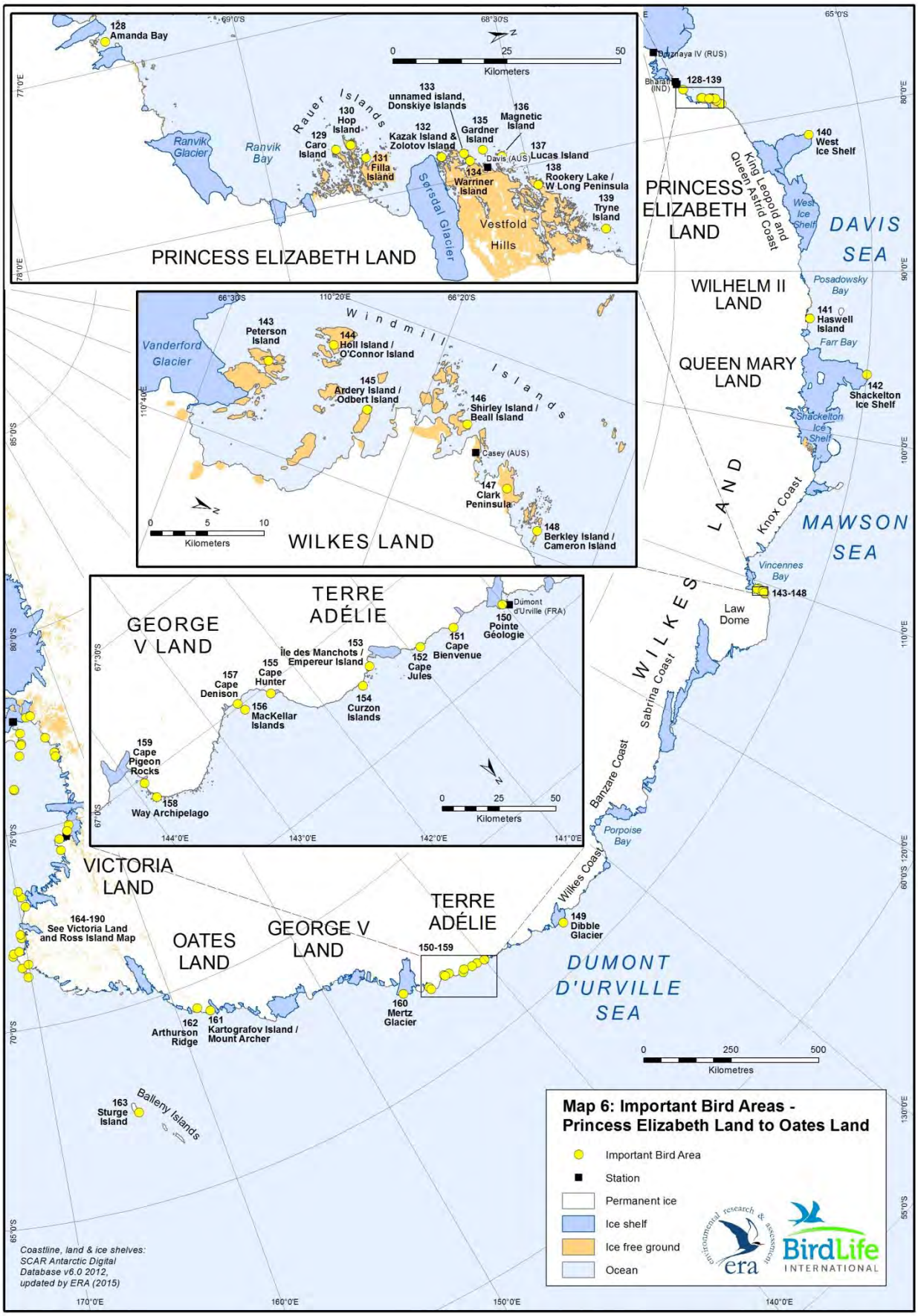


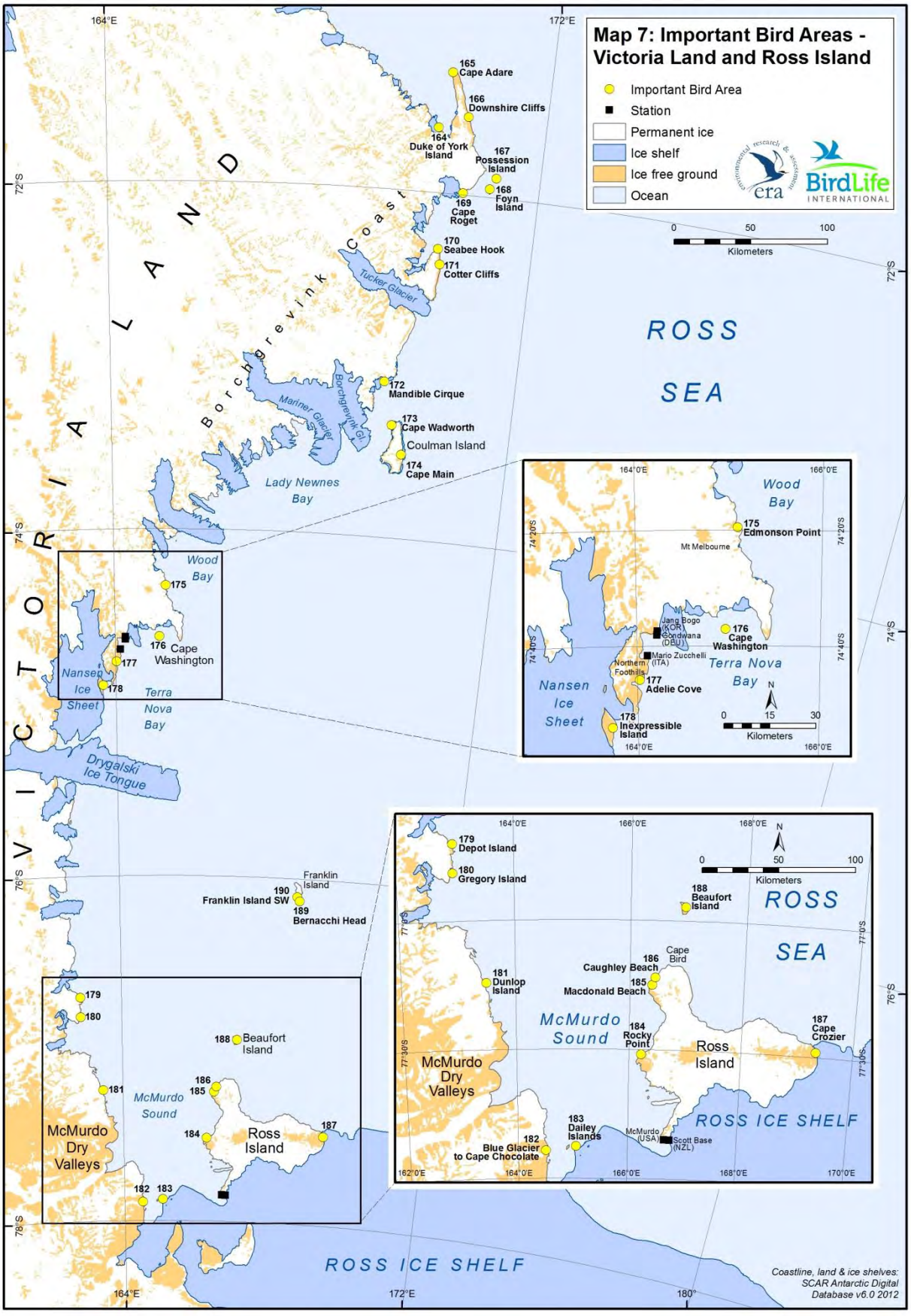

46°30'W
46°0'W
45°30'W
45°0'W
44°30'W
60°15'S
60°30'S
60°45'S
61°0'S
SOUTH ATLANTIC OCEAN
WEDDELL SEA
Coronation Island
Norway Bight
Orwell Bight
Washington Strait
Powell Island
Saddle Island
Laurie Island
023 Inaccessible Islands
001 Larsen Islands / Moreton Point
022 Return Point / Cheal Point
021 Gosling Islands
018 Shingle Cove
019 Signy Island
Signy (GBR)
020 Moe Island
002 Gibbon Bay
017 Robertson Islands north
016 Atriceps Island
015 Southern Powell Island
004 Weddell Island
003 Eillium Island
014 Cape Robertson
Orcadas (ARG)
013 Islet SW of Cape Davidson
012 Point Martin
006 Fergusie Peninsula
005 Pirie Peninsula
007 Watson Peninsula
008 Fraser Point
009 Buchanan Point
010 Ferrier Peninsula
011 Cape Whitson
N
0
10
20
Kilometers
Map 2: Important Bird Areas - South Orkney Islands
Important Bird Area
Station
Permanent ice
Ice shelf
Ice free ground
Ocean
era
BirdLife INTERNATIONAL
Coastline, land & ice shelves: SCAR Antarctic Digital Database v6.0 2012

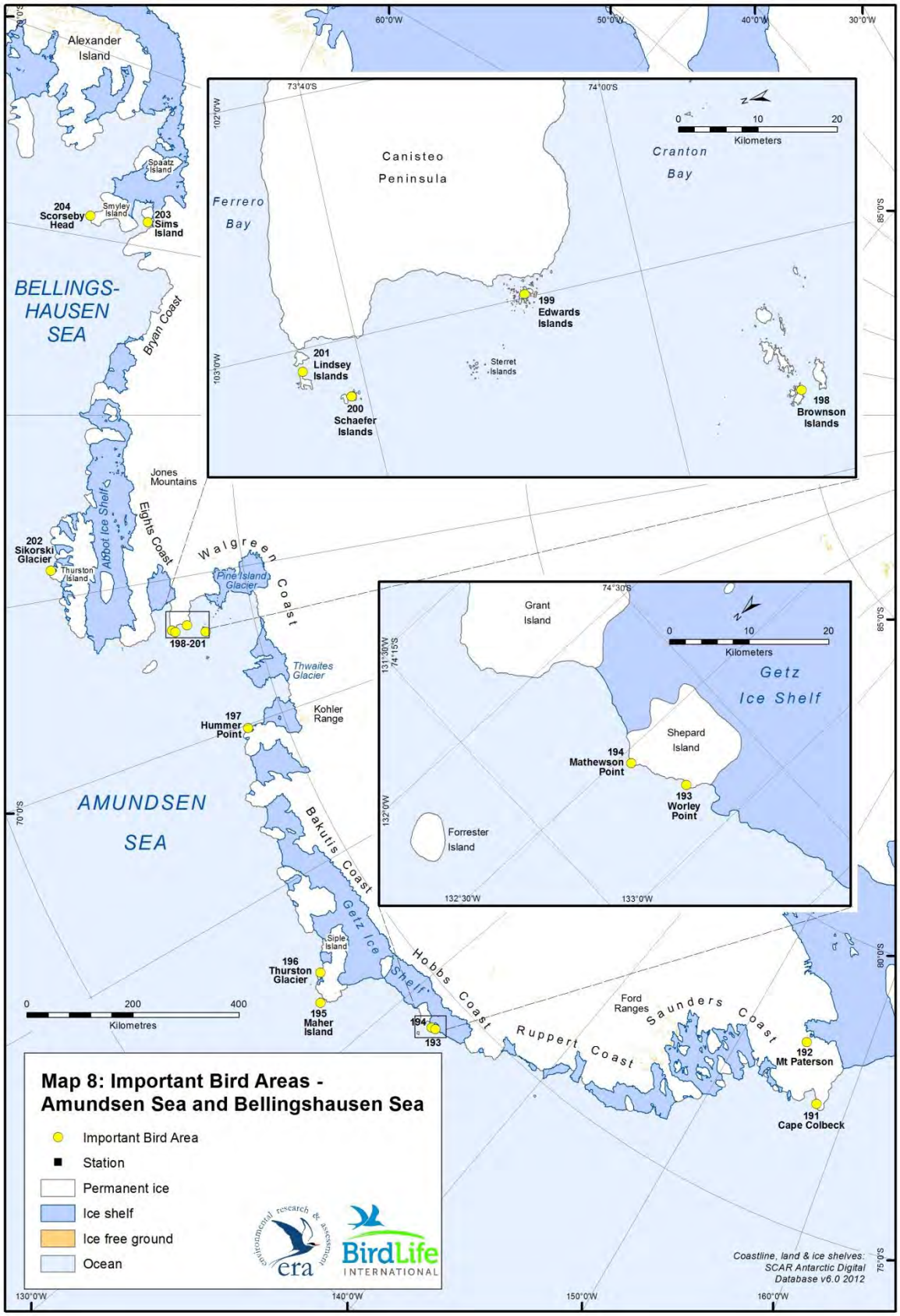

Drake Passage
Bransfield Strait
King George Island
039 Kellick Island
038 Tartar Island
041 Pottinger Point
042 False Round Point
043 Milosz Point / Czeslaw Point
044 North Foreland
040 Owen Island
037 Eastern Litwin Bay
Stigant Point
Cape Melville
Penguin Island
Lions Rump
Ferraz (BRA)
Machu Picchu (PER)
045 Point Hennequin
Vicente (ECU)
Marsh (CHL)
Frei (CHL)
Bellingshausen (RUS)
Artigas (URY)
Arctowski (POL)
048 Ardley Island
Great Wall (CHN)
King Sejong (KOR)
Carlini (ARG)
046 West Admiralty Bay
047 Potter Peninsula
050 Heywood Island
Robert Island
049 Harmony Point
Nelson Island
028 Seal Islands
Sealers Passage
029 Saddleback Point
Prince Charles Strait
Elephant Island
033 Stinker Point
030 Point west of Walker Point
031 Mt Elder
032 Point west of Cape Lookout
Clarence Island
027 Chinstrap Cove
024 Sugerloaf Island
026 Craggy Point
025 Cape Bowles
Loper Channel
035 Aspland Island/ Eadie Island
034 Gibbs Island
036 O'Brien Island
Cape Shirreff
Livingston Island
051 Yankee Harbour
Greenwich Island
Câmara (ARG)
052 Halfmoon Island
054 Byers Peninsula
Ohridski (BGR)
Juan Carlos I (ESP)
053 Barnard Point
Snow Island
Deception Island
Decepción (ARG)
Gabriel de Castilla (ESP)
055 Baily Head
056 Vapour Col
057 Cape Wallace
060 Jameson Point
Low Island
058 Cape Hooker
059 Cape Garry
Smith Island
057-060
024-036
037-050
051-056
061-099
See Antarctic Peninsula Map
Kilometers
Coastline, land & ice shelves:
SCAR Antarctic Digital
Database v6.0 2012
Map 3: Important Bird Areas - South Shetland Islands
Important Bird Area
Delisted Important Bird Area
Station
Permanent ice
Ice shelf
Ice free ground
Ocean
BirdLife INTERNATIONAL


Map 4: Important Bird Areas - Antarctic Peninsula
Important Bird Area
Delisted Important Bird Area
Station
Permanent ice
Ice shelf
Ice free ground
Ocean
Coastline, land & ice shelves: SCAR Antarctic Digital Database v4.1 2005 & v6.0 2012
Anvers Island
Renaud Island
Joinville Island
Dundee Island
Adelaide Island
Marguerite Bay
Palmer Archipelago
Bransfield Strait
Trinity Peninsula
Antarctic Peninsula
Davis Coast
Danco Coast
Graham Coast
Loubet Coast
Fallières Coast
Scar Inlet
Adie Inlet
Cabinet Inlet
Erebus and Terror Gulf
Firth of Tay
Antarctic Sound
James Ross Island
Brabant Island
Palmer Basin
024-060 See South Shetland Islands Map
088 Islet south of Gerlache Island
087 Joubin Islands
086 Litchfield Island
085 Cormorant Island
Dream Island
Northern Arhur Harbour
Palmer (USA)
Yelcho (CHL)
Pursuit Point
091 Islet south of Bates Island
092 Island north of Dodman Island
093 Armstrong Reef
094 Cape Evensen
Dodman Island
075 Gourdin Island
076 Duroch Islands
Bernardo O'Higgins (CHL)
077 Tupinier Island
078 Pearl Rocks
079 Cape Wollaston
080 Trinity Island Southwest
081 Cierva Point and offshore islands
082 Bluff Island
083 Cuverville Island
084 Islet east of Guépratte Island
085-088
Primavera (ARG)
Melchior (ARG)
G.Videla (CHL)
A.Brown (ARG)
Teniente Matienzo (ARG)
089 Petermann Island
090 Uruguay Island
Vernadsky (UKR)
Lavoisier Island
Rothera (GBR)
095 Avian Island
096 Ginger Islands
097 Emperor Island, Dion Islands
098 Lagotellerie Island
099 Stonington Island
Carvajal (CHL)
San Martin (ARG)
061 Ambush Bay
062 Danger Islands
063 Brash Island
064 Earle Island
065 Eden Rocks
066 Paulet Island
067 D'Urville Monument
068 Madder Cliffs
069 Snow Hill Island
070 Penguin Point
071 Cockburn Island
072 Devil Island
073 Brown Bluff
074 Hope Bay
Esperanza (ARG)
Elichiribehety (URY)
Petrel (ARG)
Marambio (ARG)
Mendel (CZE)
Tupinier Island
Kilometers


Map 5:
Important Bird Areas -
Weddell Sea to
Mac.Robertson Land
Important Bird Area
Station
Permanent ice
Ice shelf
Ice free ground
Ocean
Coastline, land & ice shelves:
SCAR Antarctic Digital
Database v6.0 2012
Kilometres
110 Muskegbukta
Fimbul Ice Shelf
Princess Astrid Coast
DRONNING MAUD LAND
Maitri (IND)
Novolazarevskaya (RUS)
SANAE IV (ZAF)
Troll (NOR)
111 Jutulsessen
112 Svarthamaren
Mühlig-Hofmann Mountains
Orvin Mountains
113 Gruber Mountains
Wohlthat Mountains
120 Gibbney Island
121 Rookery Islands
122 Klung Island / Welch Island
Mawson (AUS)
Mawson Coast
Robinson Islands
123 Andersen Island
124 Kirton Island / Macklin Island
125 Auster Rookery
MAC.ROBERTSON LAND
LAZAREV SEA
109 Atka Iceport
Neumayer III (DEU)
Princess Martha Coast
Princess Ragnhild Coast
114 Princess Ragnhild Coast
Riiser-Larsen Peninsula
115 Riiser-Larsen Peninsula
108 Riiser-Larsen Ice Shelf
Ritscher Upland
107 'Drescher Inlet
Aboa (SWE)
Kraul Mountains
Kirwan Escarpment
Princess Elisabeth (BEL)
Sør Rondane Mtns
Syowa (JPN)
106 Stancomb-Wills Glacier
Svea (SWE)
Heimefront Range
Kohnen (DEU)
Queen Fabiola Mtns
Brunt Ice Shelf
Caird Coast
COSMONAUTS SEA
116 Mt Biscoe
117 Cape Batterbee
Napier Mtns
Prince Olav Coast
ENDERBY LAND
118 Kloa Point
119 Taylor Rookery
120-125
KEMP LAND
Mawson Coast
MAC.ROBERTSON LAND
126 Scullin & Murray Monoliths
127 Cape Darnley
Amery Ice Shelf
Prydz Bay
Druzhnaya IV (RUS)
Dome Fuji (JPN)
WEDDELL SEA
Halley (GBR)
105 Brunt Ice Shelf
104 Dawson-Lambton Glacier
COATS LAND
Luitpold Coast
103 Luitpold Coast
Belgrano II (ARG)
Theron Mountains
102 Coalseam Cliffs
Shackelton Range
101 NW Berkner Island
100 Smith Peninsula
Filchner Ice Shelf
Berkner Island
Ronne Ice Shelf


128 Amanda Bay
Rauer Islands
133 unnamed island, Donskiye Islands
130 Hop Island
129 Caro Island
132 Kazak Island & Zolotov Island
135 Gardner Island
136 Magnetic Island
137 Lucas Island
131 Filla Island
134 Warriner Island
138 Rookery Lake / W Long Peninsula
139 Tryne Island
Ranvik Glacier
Ranvik Bay
Sørsdal Glacier
Vestfold Hills
PRINCESS ELIZABETH LAND
Davis (AUS)
Bharati (IND)
Bolshaya IV (RUS)
128-139
140 West Ice Shelf
King Leopold and Queen Astrid Coast
West Ice Shelf
PRINCESS ELIZABETH LAND
DAVIS SEA
WILHELM II LAND
Posadowsky Bay
141 Haswell Island
Farr Bay
QUEEN MARY LAND
142 Shackelton Ice Shelf
Shackelton Ice Shelf
Windmill Islands
143 Peterson Island
144 Holl Island / O'Connor Island
145 Ardery Island / Odbert Island
146 Shirley Island / Beall Island
Vanderford Glacier
Casey (AUS)
147 Clark Peninsula
148 Berkley Island / Cameron Island
WILKES LAND
Knox Coast
MAWSON SEA
Vincennes Bay
143-148
Law Dome
WILKES LAND
Sabrina Coast
Banzare Coast
Porpoise Bay
Wilkes Coast
TERRE ADÉLIE
GEORGE V LAND
Dumont d'Urville (FRA)
150 Pointe Géologie
151 Cape Bienvenue
152 Cape Jules
153 Île des Manchots / Empereur Island
155 Cape Hunter
157 Cape Denison
156 MacKellar Islands
154 Curzon Islands
159 Cape Pigeon Rocks
158 Way Archipelago
VICTORIA LAND
164-190 See Victoria Land and Ross Island Map
OATES LAND
GEORGE V LAND
TERRE ADÉLIE
150-159
149 Dibble Glacier
160 Mertz Glacier
162 Arthurson Ridge
161 Kartografov Island / Mount Archer
DUMONT D'URVILLE SEA
163 Sturge Island
Balleny Islands
Kilometers
Kilometres
Map 6: Important Bird Areas - Princess Elizabeth Land to Oates Land
Important Bird Area
Station
Permanent ice
Ice shelf
Ice free ground
Ocean
Coastline, land & ice shelves: SCAR Antarctic Digital Database v6.0 2012, updated by ERA (2015)
era
BirdLife INTERNATIONAL


Map 7: Important Bird Areas - Victoria Land and Ross Island
Important Bird Area
Station
Permanent ice
Ice shelf
Ice free ground
Ocean
Kilometers
VICTORIA LAND
ROSS SEA
ROSS ICE SHELF
Borchgrevink Coast
Tucker Glacier
Mariner Glacier
Borchgrevink Gl.
Lady Newnes Bay
Coulman Island
Wood Bay
Nansen Ice Sheet
Terra Nova Bay
Drygalski Ice Tongue
McMurdo Sound
McMurdo Dry Valleys
Ross Island
Franklin Island
Franklin Island SW
Bernacchi Head
Mt Melbourne
Cape Bird
Beaufort Island
Coastline, land & ice shelves: SCAR Antarctic Digital Database v6.0 2012


Alexander Island
Spaatz Island
204 Scorseby Head
Smyley Island
203 Sims Island
BELLINGS-HAUSEN SEA
Bryan Coast
Jones Mountains
Eights Coast
Abbot Ice Shelf
202 Sikorski Glacier
Thurston Island
198-201
Walgreen Coast
Pine Island Glacier
Thwaites Glacier
Kohler Range
197 Hummer Point
AMUNDSEN SEA
Bakutis Coast
Getz Ice Shelf
Siple Island
196 Thurston Glacier
195 Maher Island
194
193
Hobbs Coast
Ruppert Coast
Ford Ranges
Saunders Coast
192 Mt Paterson
191 Cape Colbeck
Canisteo Peninsula
Ferrero Bay
Cranton Bay
199 Edwards Islands
201 Lindsey Islands
Sterret Islands
200 Schaefer Islands
198 Brownson Islands
Grant Island
Getz Ice Shelf
Shepard Island
194 Mathewson Point
193 Worley Point
Forrester Island
0 200 400 Kilometres
0 10 20 Kilometers
Map 8: Important Bird Areas - Amundsen Sea and Bellingshausen Sea
Important Bird Area
Station
Permanent ice
Ice shelf
Ice free ground
Ocean
BirdLife INTERNATIONAL
Coastline, land & ice shelves: SCAR Antarctic Digital Database v6.0 2012

Site accounts – not provided in Summary

The IBAs identified in this Summary are described in detailed Site Accounts contained in the complete volume of *Important Bird Areas in Antarctica 2015*. The Site Accounts provide information on the bird species present and numbers breeding at each site according to best available data, as well as summary information on the main features of the environment at each IBA. Observations of other endemic wildlife are noted, and any specific conservation issues that exist at sites are identified. References for further reading pertinent to each site are also provided. The complete volume of *Important Bird Areas in Antarctica 2015* is available online at BirdLife International and Environmental Research & Assessment.

Conclusion

The list of IBAs presented in this report identifies 204 breeding sites that meet the global IBA criteria in Antarctica. The Site Accounts provided in the full report describe for each IBA the bird species present and their numbers, key features of the local environment, other wildlife present, potential conservation issues, and provides references to further data and descriptions. The Site Accounts include maps showing the IBA boundaries in their local context, including prominent physical features, nearby research stations, and protected areas in the vicinity.

Birds in Antarctica are subjected to a range of local and global threats to their health and survival, including direct disturbance to breeding by visitors, disturbance by aircraft or vehicles, accumulation of pollutants, exposure to hydrocarbon pollution as a result of both minor and major spills (Penhale *et al*. 1997), ingestion of or fouling by marine debris discarded in the Southern Ocean or further afield, competition for prey from fisheries, accidental by-catch on fishing lines or in nets, introduction of disease from other parts of the world (e.g. fowl cholera), and from large-scale changes to ecosystems as a result of global environmental change.

Climate change may constitute the greatest threat to avifauna in the region, and has potential to pervade the entire region. The western Antarctic Peninsula has experienced a rapid increase in temperatures since the 1940s (Smith *et al.* 1996), resulting in a loss of sea ice in this region and changes in ecosystem structure, affecting Adélie Penguins and other species that depend on the presence of sea ice (Ducklow *et al.* 2007). For example, Adélie colony sizes on the western Antarctic Peninsula have reduced significantly over the last 30 years, possibly linked to a warming climate causing sea ice loss, as well as reduced prey availability and changes in snow accumulation rates (Emslie *et al.* 1998; McClintock *et al.* 2008; Trivelpiece & Fraser 1996). However, there is some evidence that changes in climate may be having a positive effect on other species, e.g. a southward expansion of the Gentoo Penguin breeding range in the Anvers Island area (Emslie *et al.* 1998), while elsewhere in parts of East Antarctica and the Ross Sea the extent of sea ice and Adélie Penguin numbers seem to be increasing (Lynch & LaRue 2014; Lyver *et al*. 2014), while Emperor Penguins may be stable in some regions (Barber-Mayer *et al*. 2008) and declining in others (Barbraud *et al*. 2011).

The purpose of this IBA assessment has not, however, been to investigate – much less to explain – the pressures and changes to which Antarctic birds are subject. Suffice to say that these cumulative pressures pose a significant challenge to Antarctic birds. Rather, the intention is to draw attention to those sites in Antarctica that, according to best available data, possess breeding colonies of birds in such numbers that they qualify as IBAs according to the standard methodology developed and customised by BirdLife International in collaboration with SCAR.

The Important Bird Area programme was originally established by BirdLife International more than 35 years ago to provide a means of identifying sites of international conservation significance for the world's birds. To date more than 12 000 IBAs covering over 200 countries have been documented and delineated globally. To achieve this, BirdLife International worked closely with organisations and individuals in the countries concerned, resulting in publication of seven continental or regional IBA inventories and over 130 national or sub-national directories. Collectively, IBAs now cover ~5.2% of the world's land surface. All data are held in BirdLife's dedicated World Bird Database and further information is available through the Data Zone of the BirdLife website (http://www.birdlife.org/datazone/site).

All sites documented in these works were identified using a standardized set of data-driven criteria and thresholds. These ensure a consistent approach worldwide. The four criteria are based upon the confirmed regular presence at sites of more than threshold numbers of globally threatened species, groups of species of restricted range, species assemblages confined to a single biome and congregations of one or more species. These criteria have been used successfully over the past three decades and have proved remarkably effective and versatile in all environments where they have been applied.

Continental Antarctica, together with offshore island groups such as the South Shetland, South Orkney and Balleny islands, represented a significant gap in the global coverage of IBAs in the terrestrial environment. The current study has, for the first time, assembled and analysed available data on the avifauna of Antarctica according to the standard IBA criteria to identify and describe those sites that possess characteristics that indicate they are of particular importance to species conservation.

Online resources

Agreement on the Conservation of Albatrosses and Petrels (ACAP) Data Portal – Southern Giant Petrel.
URL: http://data.acap.aq/taxon_profile.cfm?taxa_code=MAI#P16 – Accessed 02/09/2010.

Antarctic Treaty System Visitor Site Guidelines, *Brown Bluff*:
URL http://www.ats.aq/siteguidelines/documents/Brown_e.pdf – Accessed 10/05/2011.

Antarctic Treaty System Visitor Site Guidelines, *Cuverville Island*:
URL: http://www.ats.aq/siteguidelines/documents/Cuverville_e.pdf – Accessed 13/08/2010.

Antarctic Treaty System Visitor Site Guidelines, *Devil Island*:
URL http://www.ats.aq/siteguidelines/documents/Devil_e.pdf – Accessed 10/05/2011.

Antarctic Treaty System Visitor Site Guidelines: *Half Moon Island*:
URL: http://www.ats.aq/siteguidelines/documents/Half_moon_e.pdf – Accessed 06/08/2010.

Antarctic Treaty System Visitor Site Guidelines: Mawson's Huts and Cape Denison.
URL: http://www.ats.aq/siteguidelines/documents/2014/Mawson's Huts and Cape Denison_e.pdf – Accessed 06/04/2015.

Antarctic Treaty System Visitor Site Guidelines, *Paulet Island*:
URL: http://www.ats.aq/siteguidelines/documents/Paulet_e.pdf – Accessed 06/08/2010.

Antarctic Treaty Visitor Site Guidelines, *Penguin Island*:
URL: http://www.ats.aq/siteguidelines/documents/Penguin_e.pdf – Accessed 06/08/2010.

Antarctic Treaty System Visitor Site Guidelines, *Petermann Island*:
URL http://www.ats.aq/siteguidelines/documents/Petermann_e.pdf – Accessed 10/05/2011.

Antarctic Treaty System Visitor Site Guidelines, *Shingle Cove*:
URL: http://www.ats.aq/siteguidelines/documents/shingle_cove_e.pdf – Accessed 05/04/2015.

Antarctic Treaty System Visitor Site Guidelines: *Stonington Island*:
URL: http://www.ats.aq/siteguidelines/documents/Stonington_island_e.pdf – Accessed 06/08/2010.

Antarctic Treaty System Visitor Site Guidelines, *Yankee Harbour*:
URL: http://www.ats.aq/siteguidelines/documents/Yankee_e.pdf – Accessed 04/08/2010.

British Antarctic Survey, *Signy Island Research Station*. BAS, Cambridge:
URL: http://www.antarctica.ac.uk/living_and_working/research_stations/signy/ – Accessed 02/09/2010.

Coats, L. 2010. Antarctic field season 2010: update #4: Cape Bird:
URL: http://www.coplateau.com/Update4_Cape_Bird.html – Accessed 30/01/2015.

Council of Managers for National Antarctic Programs (COMNAP). *Antarctic Facilities*:
URL: https://www.comnap.aq/facilities – Accessed 22/04/2010.

International Association of Antarctic Tour Operators (IAATO). Tourism Statistics:
URL: http://www.iaato.org/tourism_stats.html – Accessed 2010-15.

International Polar Foundation 2015:
URL:http://www.antarcticstation.org/news_press/press_release/newly_discovered_emperor_penguin_colony_receives_first_human_visitors – Accessed 25/01/2015.

Palmer LTER project:
URL: http://pal.lternet.edu/ – Accessed 04/08/2010.

Protected and Managed Area Management Plans

Antarctic Specially Managed Area (ASMA)

ASMA No. 1 Admiralty Bay, King George Island: Management Plan 2014.

ASMA No. 4 Deception Island, South Shetland Islands: Management Plan 2005. Includes Conservation Strategy for Historic Site and Monument No. 71, Whalers Bay, Deception Island 2005.

ASMA No. 7 Southwest Anvers Island and Palmer Basin: Management Plan 2009.

Antarctic Specially Protected Area (ASPA)

ASPA No. 101 Taylor Rookery, Mac.Robertson Land: Management Plan 2010.

ASPA No. 102 Rookery Islands, Holme Bay, Mac.Robertson Land: Management Plan 2010.

ASPA No. 103 Ardery Island and Odbert Island, Budd Coast, Wilkes Land: Management Plan 2010.

ASPA No. 104 Sabrina Island, Balleny Islands: Management Plan 2015.

ASPA No. 105 Beaufort Island, McMurdo Sound, Ross Sea: Management Plan 2010.

ASPA No. 106 Cape Hallett, Northern Victoria Land, Ross Sea: Management Plan 2010.

ASPA No. 107 Dion Islands, Marguerite Bay, Antarctic Peninsula: Management Plan 2002.

ASPA No. 109 Moe Island, South Orkney Islands: Management Plan 2007.

ASPA No. 111 Southern Powell Island and adjacent islands, South Orkney Islands: Management Plan 2012.

ASPA No. 113 Litchfield Island, Arthur Harbour, Anvers Island, Antarctic Peninsula: Management Plan 2014.

ASPA No. 116 New College Valley, Caughley Beach, Cape Bird: Management Plan 2011.

ASPA No. 117 Avian Island, off Adelaide Island, Antarctic Peninsula: Management Plan 2013.

ASPA No. 120 Pointe-Géologie Archipelago, Terre Adélie: Management Plan 2011.

ASPA No. 124 Cape Crozier, Ross Island: Management Plan 2014.

ASPA No. 126 Byers Peninsula, Livingston Island, South Shetland Islands: Management Plan 2002

ASPA No. 127 Haswell Island: Management Plan 2011.

ASPA No. 128 Western shore of Admiralty Bay, King George Island: Management Plan 2014.

ASPA No. 132 Potter Peninsula, King George Island, South Shetland Islands: Management Plan 2013.

ASPA No. 133 Harmony Point, Nelson Island, South Shetland Islands: Management Plan 2005.

ASPA No. 134 Cierva Point and offshore islands, Danco Coast, Antarctic Peninsula: Management Plan 2006.

ASPA No. 136 Clark Peninsula, Budd Coast, Wilkes Land, East Antarctica: Management Plan 2014.

ASPA No. 140 Parts of Deception Island, South Shetland Islands: Management Plan 2005.

ASPA No. 142 Svarthamaren: Management Plan 2014.

ASPA No. 145 Port Foster, Deception Island, South Shetland Islands: Management Plan 2005.

ASPA No. 148 Mount Flora, Hope Bay, Antarctic Peninsula: Management Plan 2002.

ASPA No. 149 Cape Shirreff, Livingston Island, South Shetland Islands: Management Plan 2011.

ASPA No. 150 Ardley Island, Maxwell Bay, King George Island: Management Plan 2009.

ASPA No. 151 Lions Rump, King George Island, South Shetland Islands: Management Plan 2000.

ASPA No. 152 Western Bransfield Strait off Low Island, South Shetland Islands: Management Plan 2010.

ASPA No. 159 Cape Adare, Borchgrevink Coast: Management Plan 2010.

ASPA No. 162 Mawson's Huts, Cape Denison, Commonwealth Bay, George V Land, East Antarctica: Management Plan 2014.

ASPA No. 164 Scullin and Murray Monoliths, Mac.Robertson Land: Management Plan 2010.

ASPA No. 165 Edmonson Point, Wood Bay, Victoria Land, Ross Sea: Management Plan 2011.

ASPA No. 169 Amanda Bay, Ingrid Christensen Coast, Princess Elizabeth Land, East Antarctica: Management Plan 2014.

ASPA No. 173 Cape Washington and Silverfish Bay, Northern Terra Nova Bay, Ross Sea: Management Plan 2013.

CCAMLR Ecosystem Monitoring Program (CEMP)

CEMP No.1 Seal Islands: Management Plan 2004. CCAMLR Conservation Measure 91-03. (Lapsed 2007).

CEMP No.2 Cape Shirreff and the San Telmo Islands: Management Plan 2004. CCAMLR Conservation Measure 91-02. (Lapsed 2009).

Map references

Australian Antarctic Data Centre. 2001. Rookery Islands (SPA 2). Scale 1:20 000. Edition 1. Catalogue ID 12738.
Australian Antarctic Data Centre. 2010. Cape Denison, Scale 1: 5000. Edition 3. Catalogue ID 13575.
Australian Antarctic Data Centre. 2012. Vestfold Hills Map 1 of 5, Scale 1: 50 000. Edition 6. Catalogue ID 13979.
Australian Antarctic Data Centre. 2012. Vestfold Hills Map 2 of 5, Scale 1: 50 000. Edition 6. Catalogue ID 13980.
Australian Antarctic Data Centre. 2012. Vestfold Hills Map 4 of 5, Scale 1: 50 000. Edition 6. Catalogue ID 13982.
Australian Antarctic Data Centre. 2012. Windmill Islands Map 2 of 5, Scale 1: 50 000. Edition 6. Catalogue ID 14111.
Australian Antarctic Data Centre. 2012. Windmill Islands Map 3 of 5, Scale 1: 50 000. Edition 6. Catalogue ID 14112.
Australian Antarctic Data Centre. 2014. Casey: recreational limits, Scale 1: 15 500. Edition 5. Catalogue ID 14295.
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ACAP (Agreement on the Conservation of Albatrosses and Petrels) 2010b. ACAP Species assessment: Southern Giant Petrel *Macronectes giganteus*. Downloaded from http://www.acap.aq on 12/03/2015.

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Ainley, D.G., Morrell, S.H. & Wood, R.C. 1986. South Polar Skua breeding colonies in the Ross Sea region. *Notornis* **33**: 155-63.

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