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Progress Report on the Development of a Seabird Identification Guide for use by tRFMOs

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 <p data-bbox="213 510 456 546">Agreement on the Conservation of Albatrosses and Petrels</p>	<p data-bbox="512 203 1038 398" style="text-align: center;">Progress Report on the Development of a Seabird Identification Guide for use by tRFMOs</p> <p data-bbox="517 472 1031 607" style="text-align: center;"><i>Nadeena Beck¹, Yukiko Inoue², Hiroshi Minami² & Warren Papworth¹</i></p> <p data-bbox="507 656 1023 757">¹ <i>ACAP Secretariat</i> ² <i>National Research Institute of Far Seas Fisheries, Shizuoka, Japan</i></p>	
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SUMMARY

At the first meeting of the Joint Tuna RFMO Technical Working Group on Bycatch in July 2011, ACAP offered to develop a standardised seabird identification guide to assist with the harmonisation of data collection across the RFMOs. ACAP has been working with the Japanese National Research Institute of Far Seas Fisheries (NRIFSF) to produce a draft photo identification guide for seabird bycatch for use by observers at sea. The draft guide primarily uses head and bill characteristics and includes photos of dead seabirds caught as bycatch in longline fisheries to facilitate fast and accurate identification. This paper provides an update on progress and seeks expert input from WCPFC SC9 and the Coordinators of relevant observer programmes.

RECOMMENDATIONS

1. That WCPFC SC9 consider the issues presented in Section 5 and provide comments and suggestions for improvements where relevant; and
2. That this paper be forwarded to coordinators of relevant observer programmes for their input on the issues presented in Section 5.

1. BACKGROUND

At the first meeting of the Joint Tuna RFMO Technical Working Group on Bycatch, which preceded Kobe III, ACAP offered to review the seabird identification guides currently used by the tuna regional fisheries management organisations (tRFMOs), with a view to producing a consolidated version that could be used by all tRFMOs, thereby assisting with the harmonisation of data collected by them. The identification of seabird bycatch to species level is essential for analyzing the effectiveness of mitigation measures and to undertake meaningful population analysis, however, with some exceptions, the data currently being collected by observer programmes operating under the auspices of tRFMOs is not currently sufficient to undertake these analyses.

To be as effective as possible, an ID guide needs to account for several difficulties associated with the identification of seabird bycatch by fisheries observers at sea. Firstly, the guide needs to cater for the range in ability of observers to accurately identify bird species. Some are skilled at identifying birds to species level, while others are only capable of identifying broad taxonomic groups e.g. distinguishing albatrosses from petrels. Secondly, many distinguishing characteristics presented in existing guides are based on observing live birds around the boat, rather than dead birds landing on deck. Most existing guides rely on the observation of plumage characteristics that may be difficult to identify on waterlogged carcasses, or, if only partial carcasses or heads are landed, may not be present at all. However, the examination of dead birds allows for the close observation and measurement of characteristics of the bill and head that may be difficult to observe on live birds. Thirdly, given the ever increasing demands on observers to collect additional data, the guide needs to be simple and fast to use.

To this end, two ID guide products are currently being developed: 1) a pocket ID guide for use by observers on deck, and 2) a more comprehensive photo ID guide that would be available on fishing vessels for reference purposes and could also be used during observer training programs. The two products are complementary and are designed to be used together to obtain the most accurate species identification possible. The contents of these are further outlined below. In the future, it may be desirable to supplement these guides with an electronic key (using Lucid software, for example) or an ID application for smartphones.

It is important to recognise that it will not be possible for non-expert observers to identify every individual to species level. For example, an inexperienced observer is likely to confuse Grey-headed (*T. chrysostoma*) and Buller's (*T. bulleri*) albatrosses. Therefore, it is recommended that, where possible, carcasses are retained for collection and identification back on shore. If this is not possible, the minimum data collection requirements for seabird bycatch consist of taking photographs of each bird, and the collection of feathers or tissue, allowing species to be identified by genetic analysis. Photographs and feather samples are already routinely collected in the Japanese Fisheries Agency (JFA) national observer programme and the JFA data collection protocols have been included in the draft photo ID guide.

2. METHOD

We reviewed existing tRFMO seabird ID guides, as well as a number of guides from national observer programmes, to assess the methodologies and/or information that would be valuable to include in the identification guide. In particular, the inclusion of photos of bycaught seabirds in the identification guide of the Japanese national observer programme was deemed to add value to the approach currently being taken with many other guides. We have since collaborated with the NRIFSF which has kindly contributed a selection of their photos of dead seabirds to the draft identification guide presented in this paper, and provided assistance with the development of the guide itself.

2.1. Species List

All ACAP listed species have been included in the guide. In addition, we reviewed existing RFMO species guides (IOTC, CCSBT) and RFMO bycatch databases (WCPFC, ICCAT) to identify non-ACAP listed petrel and shearwater species with multiple records of capture in longline fisheries. Consequently, the Cape Petrel (*Daption capense*), Great-winged Petrel (*Pterodroma macroptera*), Flesh-footed Shearwater (*Puffinus carnipes*), Sooty Shearwater

(*Puffinus griseus*), Wedge-tailed Shearwater (*Puffinus pacificus*), Great Shearwater (*Puffinus gravis*), and Short-tailed Shearwater (*Puffinus tenuirostris*) have been included in the guide. In total, 37 species are included in the guide (ATTACHMENT A). Existing RFMO guides also include fulmars, boobies, gannets, frigatebirds and skuas. These species are currently not included in the guide, due to the rarity of their being caught, however additional species could be added if deemed necessary by a particular tRFMO.

2.2. Identification Key

An identification key for albatrosses was developed for inclusion in the photo ID guide. This key is based on a list of distinguishing characteristics for each species, primarily bill size and colour, with references to head colour, plumage patterns, eye colour, and distribution where these characteristics are useful in distinguishing between similar species (ATTACHMENT B). It was assumed that these traits are the most likely to survive the haul and are less ambiguous than plumage characteristics which may not be present or easily identified on dead birds. The list of distinguishing characteristics currently only applies to adult birds.

The identification of juvenile and immature *Thalassarche* individuals is not straightforward, making them difficult to include in the key. It is not possible, using bill size and colour alone, for non-experts to confidently distinguish any of the ten *Thalassarche* species, or even species groups. The current key distinguishes adult *Thalassarche* from juvenile and immature individuals, but is unable to distinguish juvenile and immature *Thalassarche* species from each other. The Japanese national observer programme uses a key based on the extent and shape of exposed skin at the base of the bill to distinguish between species groups within the *Thalassarche* (ATTACHMENT C). However, this approach may be beyond the skills of many observers. Another option is to simply refer observers to a page in the guide which presents multiple photos of each species to enable observers to find the best match for their specimen (ATTACHMENT D). These difficulties emphasise the importance of taking photographs of specimens for expert identification.

Since the petrel and shearwater species included in the guide are only a small proportion of the species that may be encountered by fishing vessels, keys have not been developed for them, in order to avoid or limit the misidentification of rarely caught species.

3. PRODUCTS

The two proposed ID guide products are: 1) a pocket ID guide and, 2) a more comprehensive Photo Identification Guide for Seabird Bycatch:

3.1. Pocket ID Guide

The pocket ID guide is intended to provide a tool that can be used on deck by observers of all levels of expertise, to facilitate fast and accurate identification. It would contain enough information for even inexperienced observers to identify birds to genus level, at a minimum, and to species level where possible, and will refer observers to the more comprehensive guide for further information. While it will not be possible to distinguish every species using only the pocket guide, it should be possible in most cases to narrow the identification down to one or two possibilities. For example, it should be possible to identify a 'Yellow-nosed albatross' without specifying whether it is an Atlantic Yellow-nosed (*T. chlororhynchos*) or an Indian Yellow-nosed (*T. carteri*). However, even this would vastly improve the resolution of the identification data currently being collected.

The pocket ID guide could take several formats, however it should be small enough to fit in a pocket, be made of plastic or waterproof paper, and be easy to use. A proposed format for the pocket guide is included at ATTACHMENT E. The pocket ID guide will concentrate primarily on bill size and colour. It will include a ruler for measuring bills and providing a scale in photographs, as well as photographs or illustrations of distinguishing bill characteristics for each species or species group.

3.2. Photo ID Guide

This guide is a larger, more comprehensive guide and will contain the albatross identification key, as well as the NRIFS protocols for photo and feather collection. It will include separate information pages for each species, with similar species presented on a single page or facing pages for ease of comparison. This guide is intended to be kept on board for reference and could also be used for observer training programs.

The albatross key is currently presented as a list of identifying characteristics, with accompanying photos, which fits on a single page (ATTACHMENT F) and can be quickly read through to identify the appropriate species group, rather than a more time-consuming process of working through a traditional dichotomous key. The user is then directed to the relevant species page(s) to confirm identification. The petrels and shearwaters will be presented as a single page (ATTACHMENT G) with multiple photos accompanied by a brief description of distinguishing characteristics and a reference to the relevant species pages. Examples of species information pages are included at ATTACHMENT H.

Ideally, the guide will include photos of dead specimens of each species. A list of those species which are missing bycatch photos is included at ATTACHMENT I.

The data collection protocols are taken from the Japanese national observer programme and include instructions for taking photographs of dead birds and collecting feather samples. They are included at ATTACHMENT J.

While not proposed at this stage, it may be desirable in future to tailor the guide to each RFMO. This would enable extraneous species to be removed in order to reduce possible confusion (e.g. the North Pacific Albatrosses could be removed from the CCSBT guide). Also, there are several species which have been recorded as bycatch in a single RFMO and so are not currently included in the general guide but could be added to the relevant RFMO guide (e.g. the ICCAT guide could include Bermuda Petrels (*Pterodroma cahow*) that have not been recorded in any other RFMO).

4. NEXT STEPS

After consideration by WCPFC-SC9, it is recommended that the draft guide be distributed amongst the coordinators of relevant WCPFC observer programmes for their input /approval and/or forwarded to WCPFC-TCC for its advice. The input received will be collated/incorporated by the authors, together with input received from other tRFMOs, in order that a consolidated seabird guide can be produced that can be used across the tRFMOs. As noted above, tRFMOs can then amend this final product, so that it contains only those species commonly caught as bycatch in their fisheries.

5. ISSUES

The input of WCPFC SC9 and the coordinators of relevant observer programmes is sought on the following aspects of the guide:

5.1. Data

1. Species list (ATTACHMENT A)
 - a) Are there any additional species which should be included in the guide?
2. Distinguishing characteristics of adult albatross species (ATTACHMENT B)
 - a) Is the species identification information accurate?
 - b) Could the ID information be easily and accurately used by observers at sea?
 - c) Is there additional information that could assist identification?
3. Juvenile and Immature *Thalassarche* (ATTACHMENT C)
 - a) Is the skin at the base of the bill a reliable characteristic for distinguishing between juvenile/immature *Thalassarche*?
 - b) Is it a characteristic that could be easily and accurately used by observers at sea?
 - c) Would it be useful to ask observers for a fourth photograph of a top view of the base of the bill?

5.2. Pocket ID Guide

4. Pocket guide format (ATTACHMENT E)
 - a) How could the presentation of the information be improved for use at sea?

5.3. Photo ID Guide

5. Albatross key format (ATTACHMENT F)
 - a) How could the presentation of the key be improved for use at sea?
6. Species information page (ATTACHMENT H)
 - a) How could the presentation of information be improved?
 - b) Would distribution maps be a useful inclusion?
 - c) Is there any additional information that would assist identification?
7. Bycatch photo gaps (ATTACHMENT I)
 - a) Can anyone provide these photos to ACAP?

8. Data collection protocols (ATTACHMENT J)

There are a number of different approaches that can be taken regarding data collection/sampling of dead seabirds brought onboard the vessel. ACAP's recommendation is that the following sequence be followed:

- a) Identify and record the species caught using the i.d. guide;

- b) Take photos of each specimen, in accordance with the protocol shown in ATTACHMENT J;
- c) If possible, return whole seabird carcass for analysis, using protocols (to be developed); or
- d) If whole carcass can't be kept, collect feather and/or tissue samples using the methodology shown in ATTACHMENT J.

Discussion/advice on the WCPFC's preferred approach would be appreciated.

ACAP will maintain a register of organisations holding photos and/or tissue/feather samples, to assist researchers wishing to make use of this material. Could the custodians of these photos/samples contact ACAP (secretariat@acap.aq) and provide their details for inclusion in the register?

9. General

- a) Are there any other comments/suggestions for improvements to the draft seabird guide?

6. ATTACHMENTS

- A Species included in the guide
- B Distinguishing characteristics of adult albatrosses
- C *Thalassarche* key
- D Juvenile/Immature *Thalassarche* ID page
- E Pocket ID Guide example
- F Albatross key
- G Petrel ID page
- H Species information page
- I Bycatch photo gaps
- J Data collection protocols

ATTACHMENT A

SPECIES INCLUDED IN THE ACAP SEABIRD BYCATCH ID GUIDE

Common name	Scientific Name
Albatrosses	
<i>Diomedea</i>	
Northern Royal Albatross	<i>Diomedea sanfordi</i>
Southern Royal Albatross	<i>Diomedea epomophora</i>
Wandering Albatross (Snowy Albatross)	<i>Diomedea exulans</i>
Antipodean Albatross (incl. <i>gibsoni</i>) (New Zealand Albatross)	<i>Diomedea antipodensis</i>
Amsterdam Albatross (Amsterdam Island Albatross)	<i>Diomedea amsterdamensis</i>
Tristan Albatross	<i>Diomedea dabbenena</i>
<i>Phoebetria</i>	
Sooty Albatross	<i>Phoebetria fusca</i>
Light-mantled Sooty Albatross	<i>Phoebetria palpebrata</i>
<i>Phoebastria</i>	
Waved Albatross	<i>Phoebastria irrorata</i>
Black-footed Albatross	<i>Phoebastria nigripes</i>
Laysan Albatross	<i>Phoebastria immutabilis</i>
Short-tailed Albatross	<i>Phoebastria albatrus</i>
<i>Thalassarche</i>	
Atlantic Yellow-nosed Albatross	<i>Thalassarche chlororhynchos</i>
Indian Yellow-nosed Albatross	<i>Thalassarche carteri</i>
Grey-headed Albatross	<i>Thalassarche chrysostoma</i>
Black-browed Albatross	<i>Thalassarche melanophris</i>
Campbell Albatross	<i>Thalassarche impavida</i>
Buller's Albatross	<i>Thalassarche bulleri</i>
Shy Albatross	<i>Thalassarche cauta</i>
White-capped Albatross	<i>Thalassarche steadi</i>
Chatham Albatross	<i>Thalassarche eremita</i>
Salvin's Albatross	<i>Thalassarche salvini</i>
Petrels	
Southern Giant Petrel	<i>Macronectes giganteus</i>
Northern Giant Petrel	<i>Macronectes halli</i>
White-chinned Petrel	<i>Procellaria aequinoctialis</i>
Spectacled Petrel	<i>Procellaria conspicillata</i>
Black Petrel (Parkinson's Petrel)	<i>Procellaria parkinsoni</i>
Westland Petrel	<i>Procellaria westlandica</i>
Grey Petrel	<i>Procellaria cinerea</i>

Common name	Scientific Name
Cape Petrel*	<i>Daption capense</i>
Great-winged Petrel*	<i>Pterodroma macroptera</i>
Shearwaters	
Balearic Shearwater	<i>Puffinus mauretanicus</i>
Flesh-footed Shearwater*	<i>Puffinus carnipes</i>
Sooty Shearwater*	<i>Puffinus griseus</i>
Wedge-tailed Shearwater*	<i>Puffinus pacificus</i>
Great Shearwater*	<i>Puffinus gravis</i>
Short-tailed Shearwater*	<i>Puffinus tenuirostris</i>
* Non-ACAP listed species.	

ATTACHMENT B

DISTINGUISHING CHARACTERISTICS OF ADULT ALBATROSSES

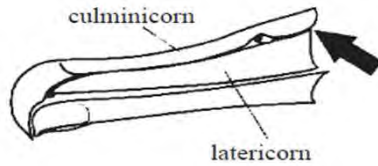
Distinguishing characteristics	Species
	<i>Phoebastria</i>
North of the equator, peach/pink bill <125 mm, grey tip, white head, dark eye patch	Laysan
North of the equator, pink bill >125 mm, blue tip	Short-tailed
North of the equator, black bill, dark head, pale eye patch and base of bill	Black footed
Yellow bill >130 mm, greenish tip, white head with yellow/buff crown/nape	Waved
	<i>Phoebetria</i>
Predominantly black bill, yellow sulcus stripe, dark head	Sooty
Predominantly black bill, pale blue sulcus stripe, dark head, pale grey back	Light-mantled Sooty
Black bill, dark head	Juvenile Sooty or Juvenile Light-mantled Sooty
	<i>Diomedea</i>
Pink or flesh coloured bill, dark cutting edge, >154 cm	Northern or Southern Royal (may be distinguished in some cases by white patches on upper wing of Southern)
Pink or flesh coloured bill, dark cutting edge, <155 cm	Amsterdam
Pink bill, no dark cutting edge >155 cm	Wandering
Pink bill, no dark cutting edge, <155 cm, South Pacific Ocean	Antipodean
Pink bill, no dark cutting edge, <155 cm South Atlantic, Indian Ocean	Tristan

Distinguishing characteristics	Species
	<i>Thalassarche (Adult)</i>
Orange bill with red tip, west Indian or Atlantic Ocean, dark iris	Black-browed
Orange bill with red tip, pale iris (not always possible to see in dead birds?)	Campbell (not found in west Indian or Atlantic Ocean)
Predominantly black bill, yellow upper ridge only, 'U' shaped base to upper ridge (not always reliable?), South Atlantic Ocean	Atlantic Yellow-nosed
Predominantly black bill, yellow upper ridge only, 'V' shaped base to upper ridge (not always reliable?), Indian Ocean	Indian Yellow-nosed
Predominantly black bill, yellow upper and lower ridges, tapering base to upper ridge, Indian or Atlantic Ocean	Grey-headed
Predominantly black bill, yellow upper and lower ridges, broad base to upper ridge	Buller's (not found in Indian or Atlantic Ocean)
Yellow bill with black lower tip	Chatham
Grey bill, yellow upper ridge, black lower tip	Salvin's
Grey bill, yellow tip	Shy or White-capped (may be distinguished in some cases by yellow colouration at base of bill in Shy)

ATTACHMENT C

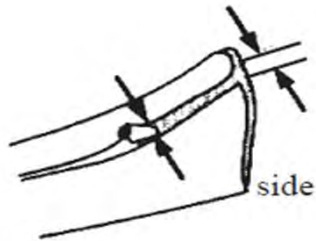
Thalassarche Key

No exposed black skin at base of bill

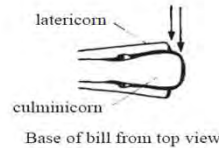


Black-browed/Campbell

Exposed skin, constant width

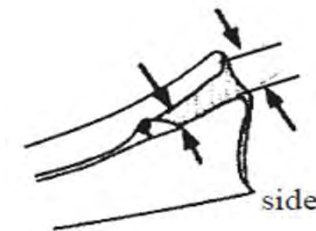


Top of bill extends beyond sides

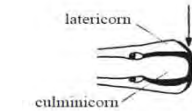


Buller's

Exposed skin, broader at base



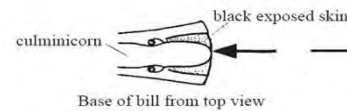
Top of bill flush with sides



Shy group



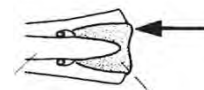
Top of bill flush with sides



Grey-headed



Exposed skin extends beyond top of bill



Yellow-nosed

JUVENILE/IMMATURE *THALASSARCHE*

1

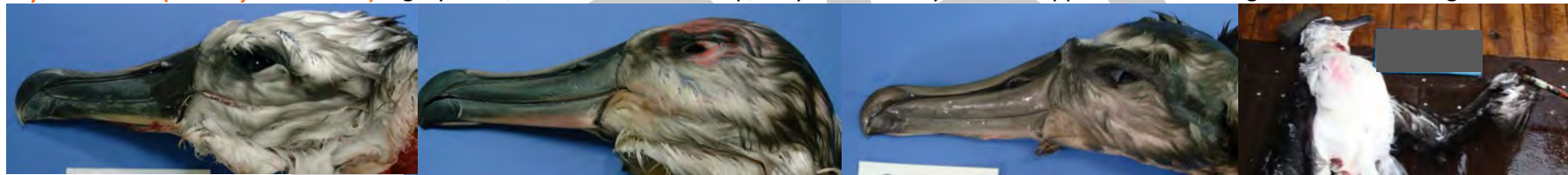
Black-browed (incl. *T. melanophrys* and *T. impavida*) - pale grey head, pale brown/grey bill with black tip, dark underwings



Yellow-nosed (incl. *T. chlororhynchos* and *T. carteri*) - white head, black bill, white underwings with black edges



Grey-headed (*T. chrysostoma*) - grey head, dark bill with black tip, may have some yellow on upper and lower ridges, dark underwings



Buller's (*T. bulleri*) - grey head with white cap, pale grey bill with black tip, white underwings with dark edges



Shy-type (incl. *T. cauta*, *T. steadi*, *T. salvini)** - pale grey head, grey bill with dark tip, white underwings with thin dark edges, 'thumbprint' at base of wing



*no photos of *T. eremita*

ALBATROSS KEY



1. Observed North of the equator

Phoebastria

North Pacific Albatrosses

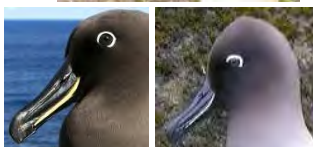
Pages 5-7



2. Yellow bill >130 mm, green tip, white head with yellow/buff crown/nape

Waved Albatross

Page 8



3. Predominantly black bill, dark head

Phoebetria

Sooty Albatrosses

Pages 9-10

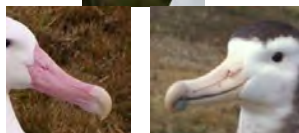


4. Pink or flesh coloured bill >154 mm, dark cutting edge

Diomedea

Royal Albatrosses

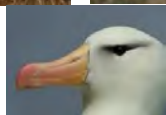
Page 11



5. Pink or flesh coloured bill > 135 mm, with or without dark cutting edge, brown or white head

Wandering Albatross Key

Page 12



6. Orange bill, red tip, white head

Thalassarche

Black-browed Albatrosses

Page 17



7. Predominantly black bill, yellow upper ridge only

Yellow-nosed Albatrosses

Page 18

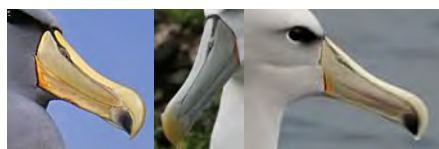


8. Predominantly black bill, yellow upper and lower ridges

Grey-headed Albatross
or
Buller's Albatross

Page 19

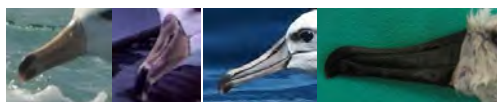
Page 20



9. Yellow or grey bill, white or grey head

Adult 'Shy type' Albatrosses

Pages 21-23



10. Other

Juvenile *Thalassarche* Key

Page 24

PETRELS

1. Northern Giant Petrel (*Macronectes halli*)

Pink bill, >80 mm, reddish tip (Page ??)



2. Southern Giant Petrel (*Macronectes giganteus*)

Pink bill, >80 mm, greenish tip (Page ??)



3. Spectacled Petrel (*Procellaria conspicillata*)

Yellow/grey bill, pale tip, >44 mm, white chin, white markings on face (Page ??)



4. White-chinned Petrel (*Procellaria aequinoctialis*)

Yellow bill, pale tip, >44 mm, white chin, no white markings on face (Page ??)



5. Westland Petrel (*Procellaria westlandica*)

Yellow bill, black tip, >44 mm, dark head, Pacific Ocean (Page ??)



6. Black (Parkinson's) Petrel (*Procellaria parkinsoni*)

Yellow bill, black tip, <44 mm, dark head, Pacific Ocean (Page ??)



7. Grey Petrel (*Procellaria cinerea*)

Yellow bill, pale tip, <44 mm, grey head, white belly (Page ??)



8. Great-winged Petrel (*Pterodroma macroptera*)

Black bill, >34 mm, dark head, pale face (Page ??)



9. Cape Petrel (*Daption capense*)

Black bill, <34 mm, dark head, white belly (Page ??)



NORTH PACIFIC ALBATROSSES

Laysan Albatross

Phoebastria immutabilis

NEAR THREATENED

Bill length: 100-112 mm

Wing length: 47-50 cm

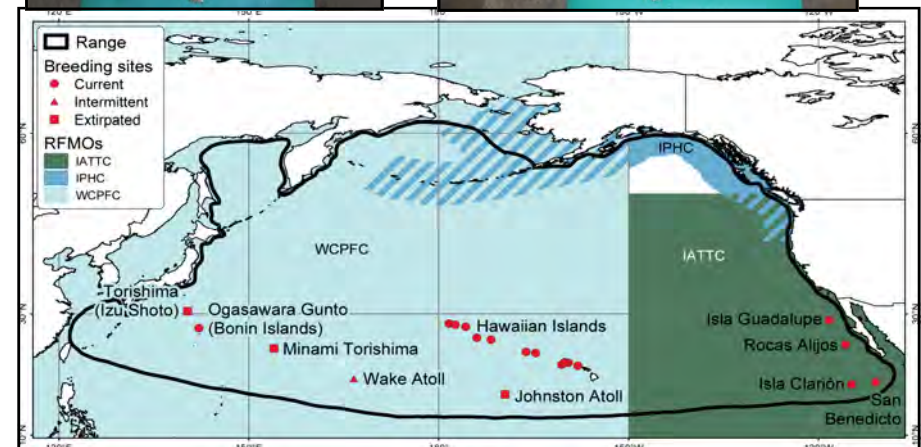
Body length: 79-81 cm

Distinguishing features:

- Northern Pacific species
- **Peach/pink bill with grey tip**
- Dark back, white head, dark patch around eye extending to grey colouration on face
- Juveniles similar to adults

Similar species:

Unlikely to be mistaken. Distinguished from Short-tailed Albatrosses (pg 7) by dark back, grey eye patch and absence of yellow colouration on head.



ATTACHMENT I

BYCATCH PHOTO GAPS

Albatrosses

- Short-tailed albatross
- Waved albatross
- Sooty/Light-mantled Sooty - juvenile
- 'Wandering' – identified to species esp. Tristan and Amsterdam
- 'Black-browed' – underwing of adult and juvenile/immature
- 'Yellow-nosed' – underwing of juvenile/immature
- Buller's albatross – juvenile/immature
- Chatham albatross – adult and juvenile/immature
- Salvin's albatross – adult and juvenile/immature

Petrels

- Spectacled petrel
- Westland petrel
- Black petrel
- Great-winged petrel

Shearwaters

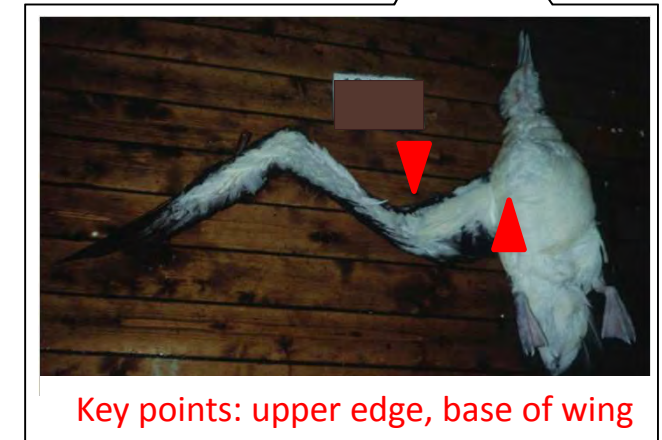
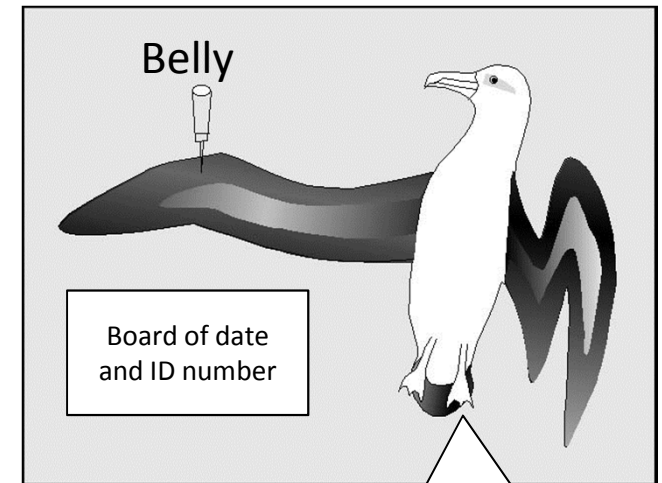
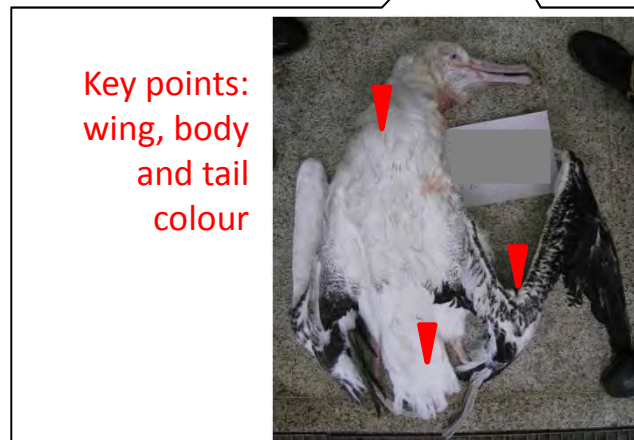
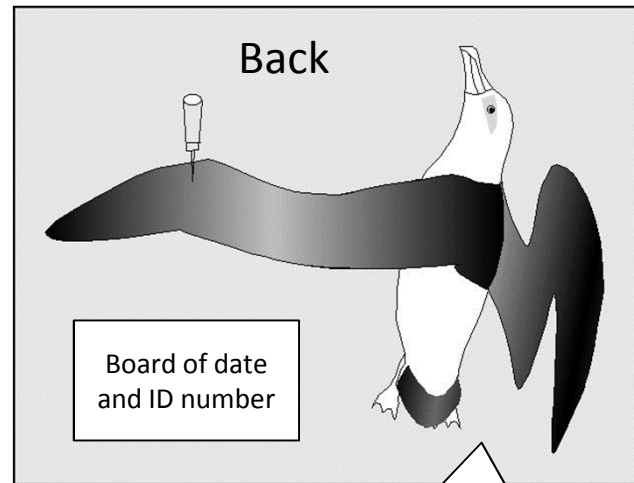
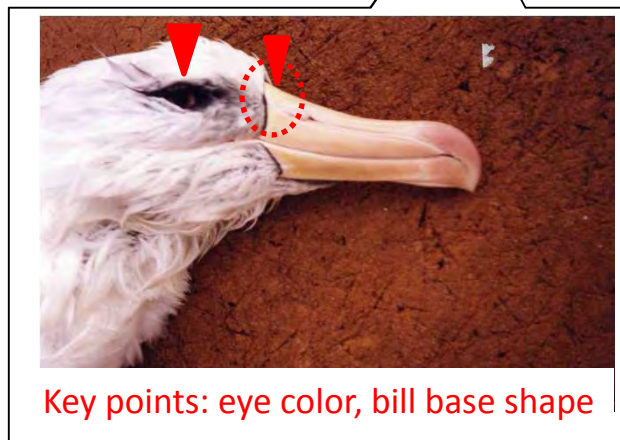
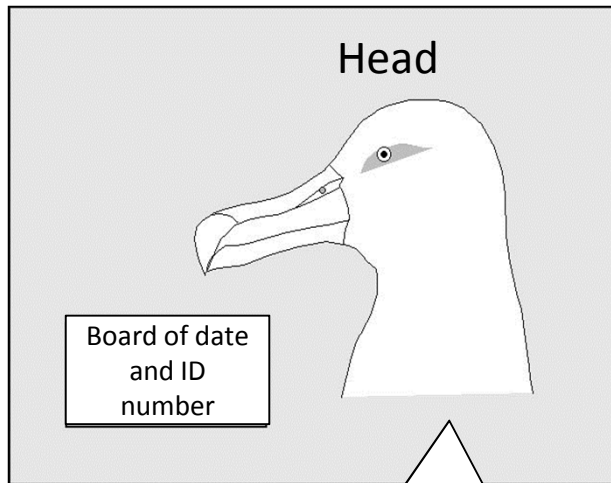
- Balearic shearwater
- Wedge-tailed shearwater

Data collection protocols

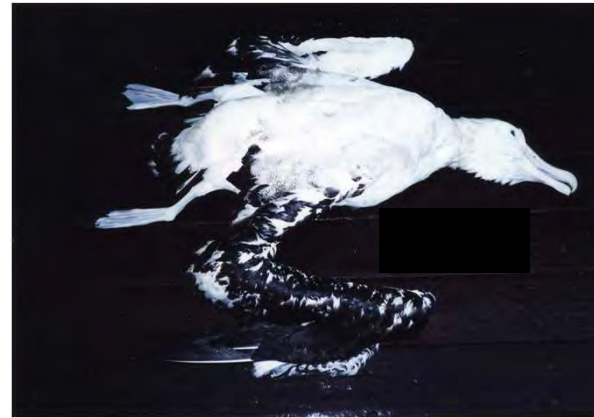
(National Research Institute of Far Seas Fisheries, Shizuoka, Japan)

Photo Collection

- ✓ At least three pictures should be taken: 1) head, 2) whole body - back side, and 3) whole body - belly side



Examples of photos



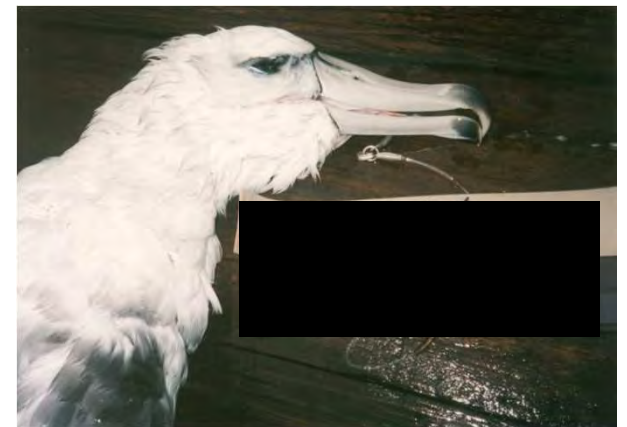
- Good example showing tail and upper edge of wing



- Good example showing eye and base of upper bill



- Good example showing bill and upper edge and base of wing



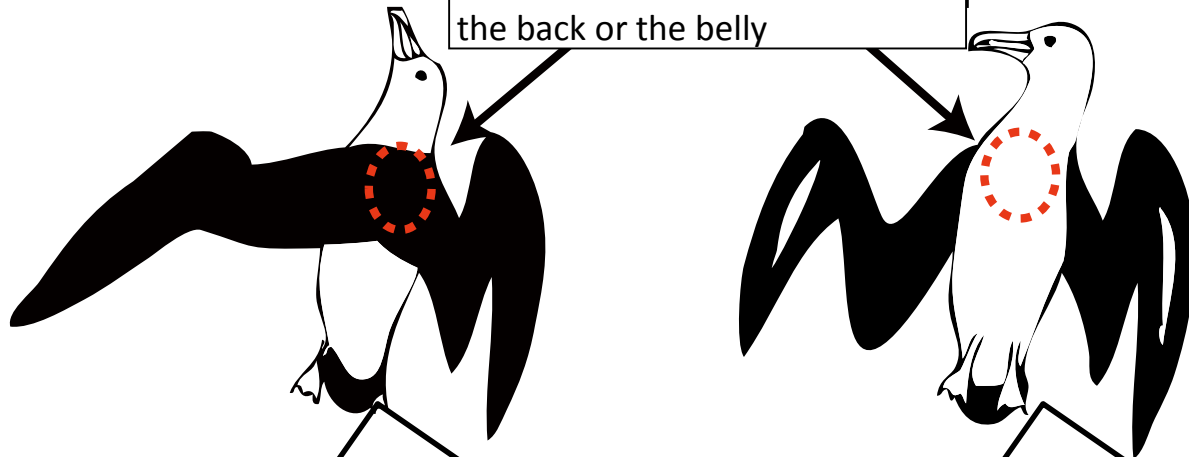
- Good example showing eye and base of upper bill

- ✓ The whole body may be taken through a number of photos

Collecting Feather samples for DNA

✓ If possible, it is useful to pull out a few feathers for DNA identification of the species

Pick five - six feathers either on the back or the belly



1. Pinch and pull 1-3 feather at once until you get 5-6 feathers
2. Keep the feathers in a plastic bag with a label
3. Store the samples in a freezer (at least under -20°C).



✓ DO NOT CUT FEATHERS - PULL
Analysis is done using the base of the feather.