IMPROVEMENT OF DATA QUALITY OF SEABIRD BYCATCH IN THE JAPANESE SCIENTIFIC OBSERVER PROGRAM

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SUMMARY

Catch data of target and non-target species have been collected by the Japanese scientific observer program since 1992. To improve the quality of observer data, we confirm what the identification is decided on the basis of ring data, autopsies and photos, and by confirming whether or not the photo data exist. Also, we crosscheck the identification with experts and update the identification to that based on new a classification system. Simultaneously, we update the species identification guide based on the new classification system. Currently, experts finalized the results from 2002 to 2008, and it has been revealed that Japanese identification is rarely mistaken. However, it has also been revealed that it is sometimes impossible to identify the species based on the new identification system using photo. To cover this point, we will start collecting feather samples for DNA analysis. Our final goal is to determine bycatch hotspot in order to determine the effect on the population and to evaluate the effects of mitigation measures after introducing this regulation in the future. It is essential that the quality of observer data in other countries also be improved as is being done in Japan.

RÉSUMÉ

Depuis 1992, les données de capture des espèces ciblées et non ciblées ont été recueillies dans le cadre du Programme japonais d'observateurs scientifiques. Afin d'améliorer la qualité des données des observateurs, nous confirmons que l'identification est réalisée sur la base des données des anneaux, des autopsies et des photos et en confirmant l'existence de données photographiques. De plus, nous avons vérifié l'identification par croisement avec des experts et mis à jour l'identification sur la base du nouveau système de classification. En outre, nous avons mis à jour le guide d'identification des espèces sur la base du nouveau système de classification. Des experts terminent actuellement les résultats de 2002 à 2008 et il s'est avéré que l'identification japonaise ne commet que de rares erreurs. Néanmoins, il est également apparu qu'il s'avère parfois impossible d'identifier les espèces en se fondant sur le nouveau système d'identification utilisant des photos. Pour résoudre cette question, nous commencerons à recueillir des échantillons de plume pour réaliser des analyses ADN. Notre objectif final consiste à localiser les zones sensibles de prise accessoire afin de déterminer l'effet sur la population et d'évaluer les effets des mesures d'atténuation après l'introduction de cette réglementation à l'avenir. Il est impératif que la qualité des données des observateurs dans d'autres pays soit également améliorée, à l'instar du Japon.

RESUMEN

Desde 1992, el Programa de observadores científicos japonés ha recopilado datos de captura de especies objetivo y no objetivo. Para mejorar la calidad de los datos de observadores, confirmamos que la identificación se decide sobre la base de datos de anillos, autopsias y fotos, y confirmando si existen o no datos fotográficos. Además, se verifica la identificación con expertos y se actualiza la identificación basándose en un nuevo sistema de clasificación. De forma simultánea, se actualiza la guía de identificación de especies basándose en el nuevo sistema de clasificación. Actualmente, los expertos han finalizado los resultados desde 2002 a 2008 y se ha descubierto que la identificación japonesa rara vez se equivoca. Sin embargo, se ha descubierto también que a veces es imposible identificar la especie basándose en el nuevo sistema de identificación utilizando fotos. Para solventar este punto, se empezarán a recoger muestras de plumas para realizar análisis de ADN. Nuestro objetivo final es identificar el punto crítico de captura fortuita con el fin de determinar el efecto sobre la población y evaluar los efectos de las medidas de mitigación tras introducir esta reglamentación en el futuro. Es esencial que la calidad de los datos de observadores de otros países mejore de forma similar a la de Japón.

KEYWORDS

Observer program, seabird bycatch, identification, new identification system

1. Recording method of seabird bycatch in current Japanese observer program

Catch data of target and non-target species has been collected by Japanese scientific observer program since 1992. In the southern hemisphere, observed areas are mainly the Tasman Sea in the WCPFC Convention area, mainly the southeastern Indian Ocean in the IOTC area, all areas in CCSBT and off South African waters in the ICCAT area. These reflect main fishery grounds by Japanese longliners and of which coverage is aimed to be 5-10%.

The observers are lectured how to record data or how to take photographs before boarding longline vessels. Observers record mainly date, time and a location when longline start to set, catch of each target fish, bycatch of each species including seabirds, whether tori line and the other mitigation measures are used (**Appendix 1**). In terms of identification of seabird species, the observer divides by-caught seabirds into taxonomic group as fine as possible. After that, scientists of NRIFSF divide them into species by the photographs in principle. The observers are instructed to take photos of the head, whole body with under- and under-side of wing of the by-caught seabird. When an individual with a ring is found, the ring number is recorded and reported to the institute where is responsible for the banding program so that we can get information of species and age of the individual. Albatrosses, the most bycaught taxon in seabirds, are divided into 4 genus 14 species based on old identification system in current Japanese observer program.

From 2011, we collaborate with ACAP and Birdlife international to have further analysis about Japanese observer data. For example, we plan to share the tracking data to analyze distribution of bycatch per unit effort.

2. Improvement of data quality of seabird identification in current Japanese scientific observer program

Though observer data are quite good information representing long-term trends of fish catch and seabird bycatch, there are also some problems:

1) ***Quality of the photos:*** Sometimes observers cannot take a photo because of oceanic conditions or too many other tasks as a fishery observer during line hauling. Hence, in some records of by-caught seabirds, a proper photo data could not be taken. There are some low-quality photographs for species identification because of lacking necessary part or blurred image.

2) ***Variation of quality of observer's identifications:*** When photo data is lacking or their quality is quite low, species identification just depends on ability of observers. Some observers have a enough ability for correct identification but others do not.

3) ***Newly developed albatross taxonomy:*** Current albatross identification is based on older identification system and it is needed to alter ID method based on newer identification system. It is very rare case but there are some individuals that locate where they definitely not range according to tracking data so it needs to confirm whether the identification is correct or not. And also, it is better that species should be divided into developmental stage, such as adult, young or juvenile.

To solve problem (1), we provide examples of photos taken with proper angle for observers to take a photo in following those example.

To solve problem (2), we organize the past seabird bycatch records on observer data. We clarify evidence for the identification, ex. photo, autopsy, ring, others, and conform whether photo data exists or not.

If there is no photograph, we set the fineness of classification according to identification ability in each observer. Identification of some observers with high ID ability should be adopted up to species level, while identification of others with poor ID ability should be adopted up to rough taxon.

To solve problem (3), current Japanese observer data based on the old classification system will be reclassified

based on the new classification system as much as possible. We are revising the identification of bycaught seabird on the past observer data, especially albatrosses, in cooperation with Birdlife international. Photo data already collected are verified by two identification experts who employed by Birdlife international to have cross-check for the result of our identification, and to update the identification based on new classification system as much as possible. In this process, information about developmental stage (adult, young or juvenile) or sex, if it is possible, are also added.

Simultaneously, we will update species identification guide (mainly Procellariiformes species) based on new classification system. In the current Japanese original classification guide, bill morphology is an important key to identify albatrosses and petrels. We plan to add new key for identification based on new classification system to update the guide. Finally, the new identification method will be applied for the Japanese observer program in the future.

3. Current progress and problem came out

Soon we will finish cleaning up our data-base about the species identification: first, we confirm what the identification is decided on the basis of (e.g., ring data, autopsy or photo). After that, we crosscheck species identification with experts using photo.

Currently, an expert finalized checking the observer data from 2002 to 2008, and it is revealed that Japanese identification is rarely mistaken (25 misidentifications with conviction of 48 misidentifications / 1916 individuals). In the 2011 ICCAT SCRS meeting in Madrid, there was a question asking whether grey-headed albatrosses were mistaken for yellow-nosed albatrosses but actually this misidentification was not found.

The problem in updating the ID guide and in crosschecking photo with the experts is that it is sometimes impossible to identify up to species level based on new identification system using the photo. Especially in the juvenile and immature birds, it is very hard to identify based on morphology. To cover this point, Japan request for observers to collect feather samples for DNA analysis. Since it is expensive to analyze DNA, testing all samples is distant. We plan to use DNA only to confirm the accuracy of species identification written in the guide or to identify especially vulnerable species, e.g., wandering-group albatrosses.

4. Final goal of analysis of bycatch distribution using observer data and issues in the future

Seabird bycatch hotspot is going to analyze by using the cross-checked and revised data in the future. In this analysis, where and how much the seabirds are caught is drawn on the map with considered several factors. In Japan, experiments related to the usefulness of bycatch mitigation measures are being developed. Finally, bycatch hotspot with considered effect to population will be analyzed in order to determine the area where the mitigation measures should be introduced. And also, observer data are essential to evaluate the effects of mitigation measures after introducing this regulation in the future.

By enhancing the credibility of identification, new information of range as well as bycatch hotspot and estimation of effect of mitigation measures will be obtained. For example, it is possible that new distribution of some albatross species will be revealed.

For meaningful analyses, it is crucial not only to raise the observer coverage but also to raise the quality of observers and observer data. To achieve this, observer training is very important. Also, this progress in the quality of observer data should be applied for target fish catch data as well as seabird data. Collaborated work with other countries is going to start under the situation where Japanese longliners are decreasing while other country's longliners are increasing. Thus, it will be strongly needed that the quality of observer data in other countries are also improved as it is being done in Japan.

Appendix 1

FAR SEAS TUNA LONGLINE FISHERIES[1]
SCIENTIFIC OBSERVER -- RESEARCH MANUAL

(WCPFC / CCSBT / IOTC area)

April, 2012 (English version)

Research for seabirds

1. Research contents

Enter the data of the seabird research in the biological measurement paper form.

Species code: Enter the species code according to the code table. When the species name could not be identified, enter the higher taxonomic group name; albatrosses (code 400), Giant petrels (code 420), Petrels (code 430), Penguins (code 370), gannets and boobys (code 510). If you could not identify, enter the code of "uncertain bird species" (code 350).

General identification of albatrosses, petrels and other seabirds (**Figures 1, 2**).

Specification-1	*Specification-2*	*Classification*	*Code*	*Bill length*	*Wing length*	*Wing span*	*Body weight*
Two tube noses on the both sides of the bill	Large size, white or brown body color, color of under wings is mostly white	Large albatross (Wandering & Royal)	351	16～20cm	60～70cm	260～320cm	6～12kg
	Medium size, white body color, color of upside wings is always black	Other albatrosses (Shy, Black-browed, Grey-headed, Yellow-nosed & Buller's)	353	10～15cm	40～60cm	170～260cm	2.5～7kg
	Medium size, black body/bill color, ashy flesh colored legs	Dark-colored albatrosses (Sooty & Light-mantled)	352	10～12cm	45～55cm	190～220cm	2～4kg

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One tube nose on the top of the bill	Medium size, flesh colored bills, black colored body/leg (sometimes brown and white colored body or black marbles on white colored body)	Giant petrels (Northern & Southern)	420	8～11cm	43～55cm	180～220cm	2～4kg
	Small size Various body colors	Petrels (Grey, White-chinned, Pink-footed, Cape, etc)	430	3～6cm	24～40cm	80～150cm	0.5～2kg
No tube nose(only nose holes on the bill)		Other Seabirds (skuas, gulls or gannets)	370 540 etc.				

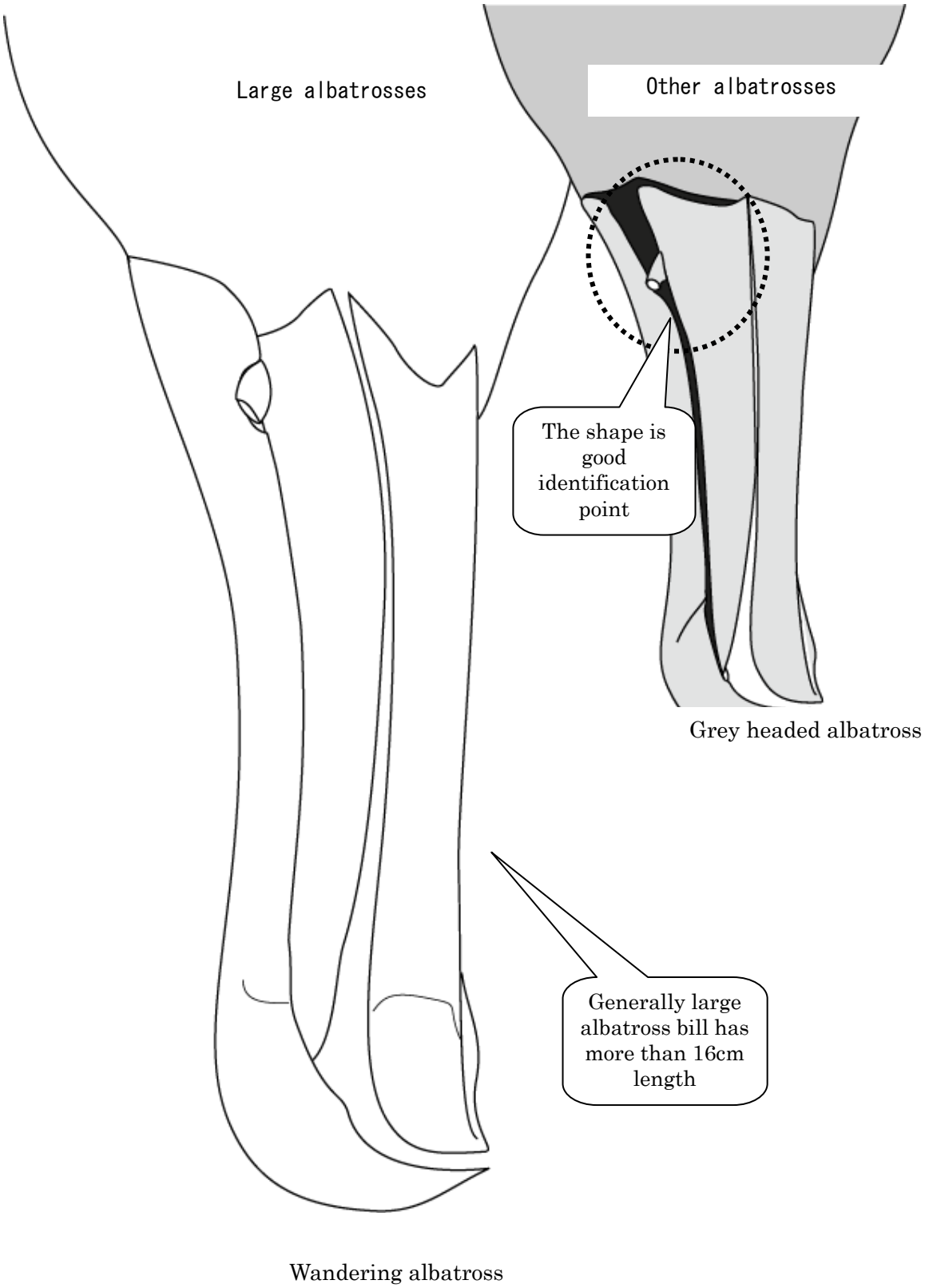

Figure 1. Shapes of seabird bill (full size).

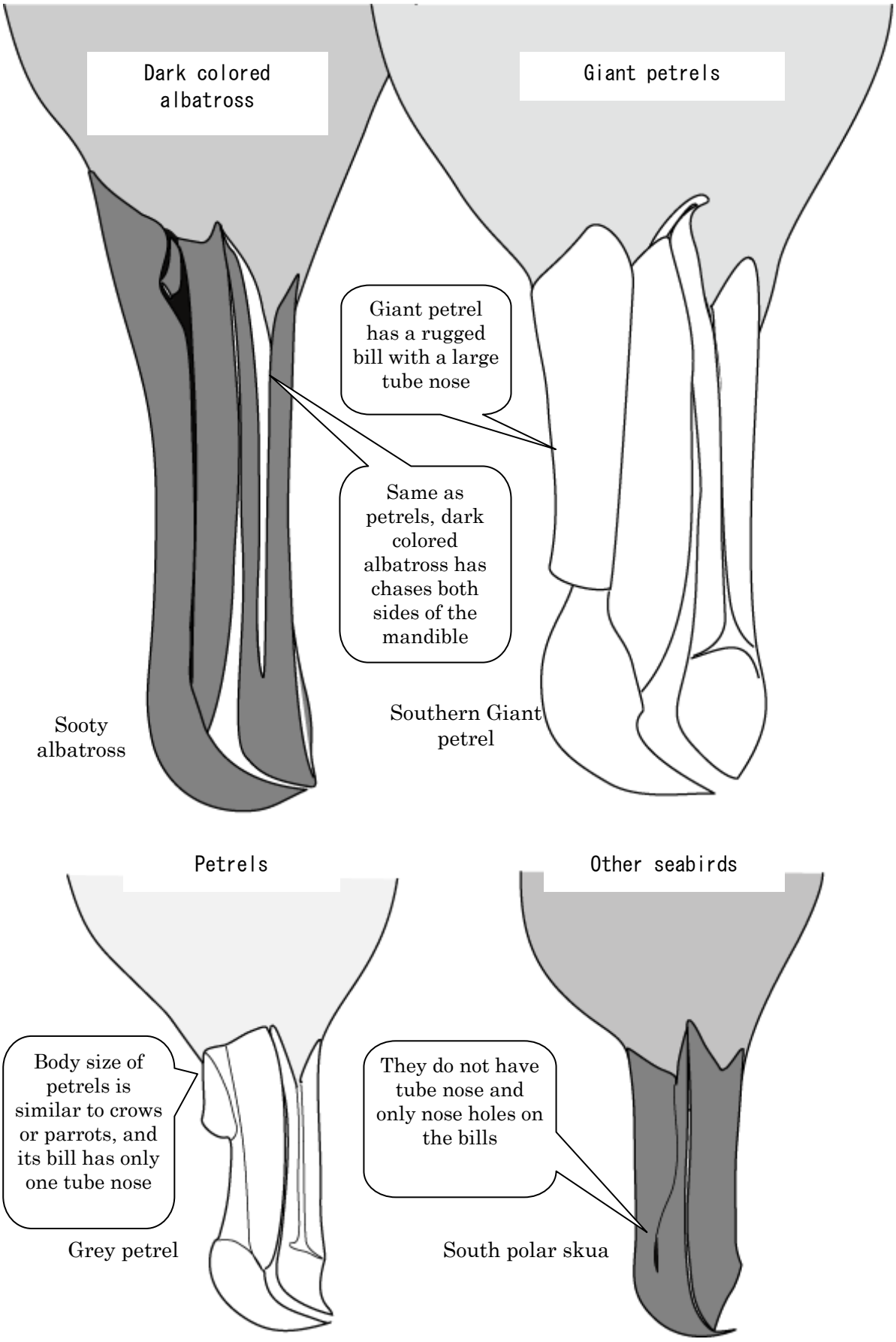

Figure 1. (continued) Shapes of seabird bill (full size).

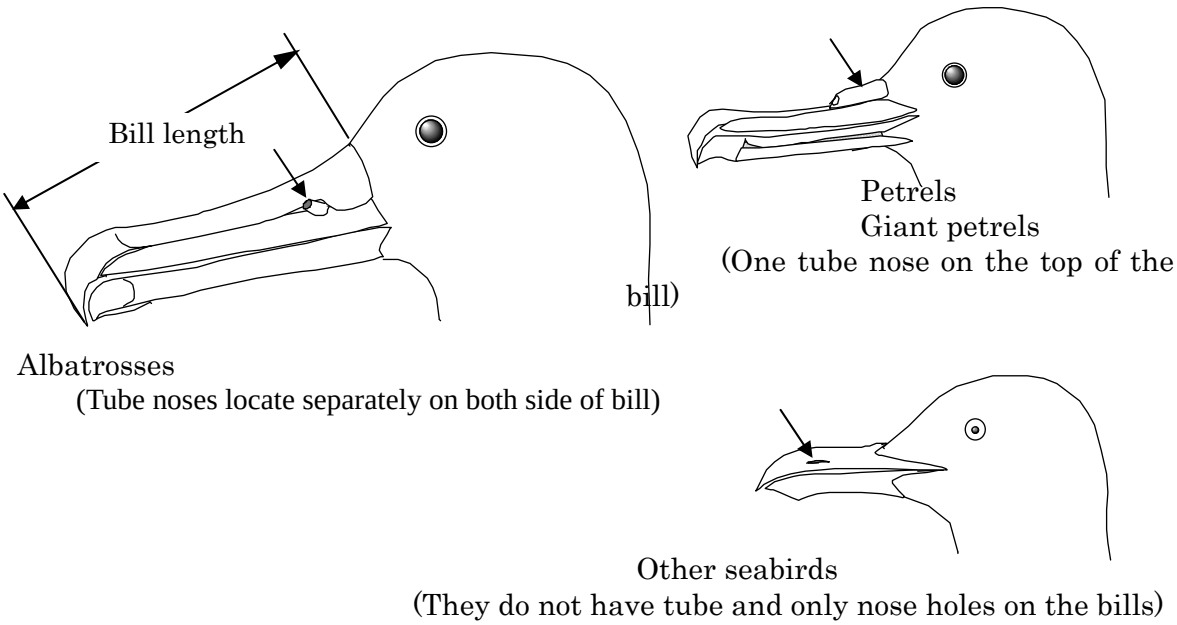

Figure 2. Identification of albatross, petrels and other seabirds.

Wing length:	Enter the measured wing length in the "Length" column (**Figure 3**)
Body weight:	Enter the measured body weight in the "Weight" column.
Samples:	When whole body samples are collected, enter "1" in the "Sample" column.
Remarks:	When any pictures are taken, enter "P" in the "remarks" column.

2. Photographs

To identify seabird species later, pictures of all by-caught seabirds and banded seabirds collected as samples must be taken. Pictures of tori-pole and tori-lines also must be taken. The photos should clearly indicate height of the tori-pole from the deck and its exterior length from side of the vessel. Also photos should illustrate deployment conditions and the existence of streamers.

a) Shooting condition

Avoid direct sunlight. If any body parts catch the direct sunlight, color of the shot differs from natural. When you use the flash, take care of the reflection. Avoid puddles from shooting seabirds. Sweep water drops from seabird body to avoid reflection and to make feather color visible.

b) Composition of pictures

Take three photos for each sea bird:

i) Side face and underside of wings (IMPORTANT: color patterns of the head and border of underside wings) (**Figure 4a**).

ii) Close shot of side face (IMPORTANT: shape of the bill including tube nose) (**Figure 4b**).

iii) Dorsal body and wings (IMPORTANT: color patterns of upside of wings, dorsal body and tail) (**Figure 4c**).

When camera memory or time is limited, take a photo of (iii) at least. Each photo should be taken with photograph board (including vessel name, date and catch serial number). If rigor mortis prevent wings from extending, take (ii) and some shots to make visible about color patterns of abdomen, downside and upside of wings (especially ratio of black/white color around ridge of the underside and color of axillar) and body.

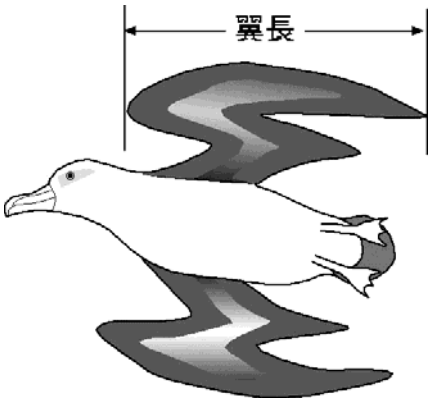

Figure 3. Measurement of wing length

Measure natural length without stretching wing or pressed it to a scale

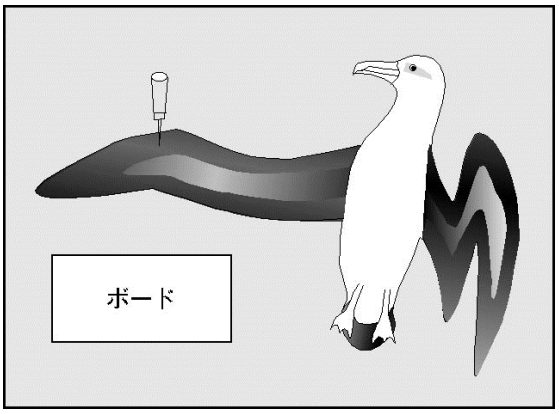

Figure 4a. Frame of the photo (i).

Make the side face and underside of wings visible. Stretch either side of wings to show axillar.

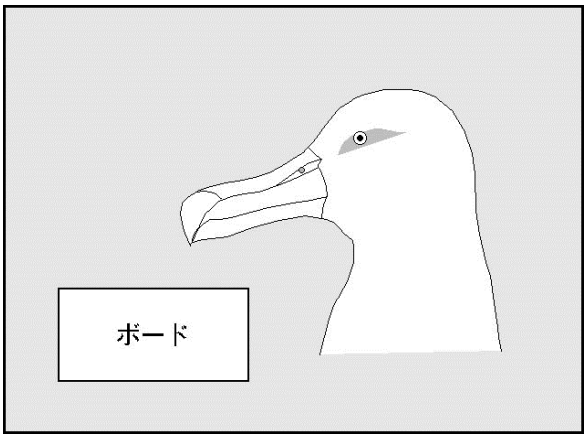

Figure 4b. Frame of the photo (ii).

Make the shape of the bill including tube nose visible.

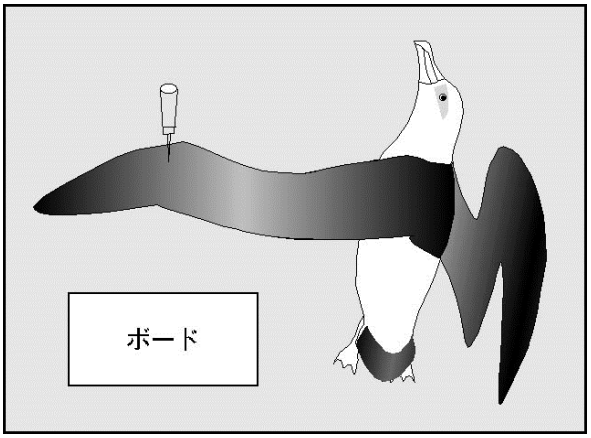

Figure 4c. Frame of the photo (iii).

Make upside of wings and body visible.

3. Collection of samples

a) ***Banded seabird***

1) If a banded seabird is captured, read the ID of the tag, and note the ID in the "remarks" column. (e.g. Tag 1347-71074). If captured seabirds are alive, read the ID and release them.
2) Under the agreement by the skipper, sample the whole body of banded seabird when they are by-caught. The samples should be frozen with inserting sample label into their throats.
3) If the skipper does not agreed with sampling, remove the band from the leg and stored with a label.

Banded seabird is important sample with clear information about birth year and place.

- If the bird is alive, release without removing of the band.

Example of seabird photograph

GOOD: Abdomen photo of grey-headed albatross. (Underside of wings and bill are clearly visible).

GOOD: Dorsal body of yellow-nosed albatross. (Upside of wings, bill and tail are clearly visible).

GOOD: Face of shy albatross. (Bill and tube nose are clearly visible).

At a busy time, taking a photo including two birds is OK. (It is needed to show each capture ID separately).

BAD: Upside of the bill is not visible.

BAD: Underside of wings and upside of bill are not visible.