



Agreement on the Conservation of Albatrosses and Petrels
Interim Secretariat provided by the Australian Government

First Meeting of Advisory Committee
Hobart, Australia, 20 – 22 July 2005

Agenda Item No .10
ACAP/AC1/Doc.12
Chair, Taxonomy Working Group

**Towards a Review of the Taxonomy of Albatrosses
and Petrels**

TOWARDS A REVIEW OF THE TAXONOMY OF ALBATROSSES AND PETRELS

1. Article IX 6 (b) of the Agreement on the Conservation of Albatrosses and Petrels (ACAP) requires the Advisory Committee to “endorse a standard reference text listing the taxonomy and maintain a listing of taxonomic synonyms for all species covered by the Agreement”. This reflects the current state of flux in the taxonomy of Procellariiformes and in particular of albatrosses.
2. Resolution 1.5 of the First Session of the Meeting of the Parties (MOP1) to ACAP provides for the establishment by the Advisory Committee of a Working Group on the taxonomy of albatross and petrel species covered by the Agreement.
3. The objective of this Working Group is to establish a transparent, defensible and highly consultative taxonomic listing process. The informal Scientific Meeting which preceded MOP1 stated that “...given the importance that species lists have upon conservation policy and scientific communication, taxonomic decisions must be based on robust and defensible criteria. It is important to resolve differences in a scientific and transparent manner with appropriate use of peer-reviewed publications” (ACAP/MOP1/Doc15, paragraph 4.3).
4. The recommendation of the informal Scientific Meeting that Michael Double (Australia) should chair the Working Group, was agreed. The Terms of Reference of the Taxonomy Working Group specifying the work program, the membership (as at July 2005), and the timetable for progress are provided in Attachment 1.

Progress to Date

5. February 2005 – The Chair of the Taxonomy Working Group invited scientists currently active in the field of procellariiforme taxonomy to be members of the Working Group. Currently (July 2005) the members of the Working Group (WG) are Michael Double (Australia; Chair), Mike Brooke (United Kingdom), Mark Tasker (United Kingdom), Peter Ryan (South Africa) and Geoff Chambers (New Zealand).
6. April 2005 – Members agreed upon the Terms of Reference for the WG (Attachment 1).
7. April 2005 – An internet web site was launched to facilitate and manage interactions between WG members through discussion forums. All submissions are automatically circulated to all members of the Working Group and archived simultaneously.
8. April 2005 – A bibliographic database of over 100 scientific papers pertinent to procellariiforme taxonomy was added to the Taxonomy WG web site. All entries are linked to portable document format (pdf) files thus providing WG members with instant access to all papers in the database.
9. May 2005 – A draft ‘Plan of Action’ for the Taxonomy WG was posted on the web site along with a request for all members to comment on the Plan (Attachment 2).
10. May 2005 – The Plan of Action was accepted by all members of the WG. The WG also agreed upon the desirability of basing the WG’s own decision-making procedure on that proposed by Helbig et al. (2002; see reference list in attachment 3) although

reservations and potential modifications were communicated to the WG by some members.

11. July 2005 –The WG has been asked to comment upon a draft document titled 'Guidelines for the identification of species boundaries among taxa listed by the ACAP' (Attachment 3).

Timeframe for Future Work

12. A proposed work programme for the WG is shown below.

Date	Action
July - August 2005	Request comments from the WG on the draft text of the 'Guidelines for the identification of species boundaries among taxa listed by the ACAP'. Discuss any further suggestions to modify the Helbig model. Also discuss the likely outcomes if these guidelines are stringently applied to the taxa listed by ACAP.
September 2005	Finalise the 'Guidelines' text.
October – December 2005	Apply the 'Guidelines' to taxa listed in the ACAP agreement beginning with those highlighted by the Scientific Committee (MOP1; ScM1; Section 4.6) .
ACAP AC2	Recommend to the Advisory Committee a standard taxonomic reference text with all possible taxonomic synonyms for species covered by ACAP.

ACTION BY ADVISORY COMMITTEE

13. The Committee is invited to provide comments on the progress and direction of the Taxonomy Working Group.

ATTACHMENT ONE

AGREEMENT ON THE CONSERVATION OF ALBATROSSES AND PETRELS

WORKING GROUP TO REVIEW THE TAXONOMY OF ALBATROSSES AND PETRELS LISTED ON ANNEX I OF THE AGREEMENT

TERMS OF REFERENCE

Article IX 6 (b) of the Agreement on the Conservation of Albatrosses and Petrels (ACAP) requires the Advisory Committee to “endorse a standard reference text listing the taxonomy and maintain a listing of taxonomic synonyms for all species covered by the Agreement”. This reflects the current state of flux in the taxonomy of Procellariiformes and in particular of albatrosses.

Resolution 1.5 of the First Session of the Meeting of the Parties (MOP1) to ACAP provides for the establishment by the Advisory Committee of a Working Group on the Taxonomy of albatross and petrel species covered by the Agreement.

The aim of this group is to establish a transparent, defensible and highly consultative listing process. It is anticipated that the work of this group will be ongoing but the initial objective will be to reach consensus over three albatross species splits which are the subject of contention: Antipodean / Gibson’s albatross *Diomedea antipodensis / gibsoni*; Shy / White-capped albatross *Thalassarche cauta / steadi* and Buller’s / Pacific albatross *T. bulleri / platei*.

These terms of reference include the work programme for the group, details of membership and a timetable for actions.

Work Programme for the Taxonomy Group

The remit of the group is set out below (taken from section one of the work programme for the Advisory Committee; Annex 2 of Resolution 1.5 adopted at the first session of the Meeting of the Parties to ACAP).

- 1.1 Establish Working Group
- 1.2 Develop terms of reference
- 1.3 Prepare draft report on three contentious albatross species splits (MOP1 report, paragraph 7.2, Informal Scientific Meeting Report (MOP1/Doc. 15), Section 4).

Membership of Working Group

Party / Signatory/ Observer	Member	Organisation / position
Australia	Mike Double, CHAIR	Australian National University
New Zealand	Geoff Chambers	University of Wellington
South Africa	Peter Ryan	University of Cape Town
United Kingdom	Mark Tasker	Joint Nature Conservation Committee
BirdLife International	Michael Brooke	BirdLife International

Timetable for progress

The following timetable has been updated from the Advisory Committee (AC) work programme (Annex 2 of Resolution 1.5) to provide for a progress report to the first meeting of the ACAP Advisory Committee (AC1), 20-22 July 2005.

Action	To be completed by	Responsibility
1.1 Establish Working Group: identify Working Group Chair and membership	End February 2005	Interim Secretariat (IS) / AC
1.2 (i) Develop draft terms of reference	End March 2005	WG Chair / IS/ AC
1.2 (ii) Circulate draft terms of reference to Advisory Committee for Agreement	End April 2005	Secretariat
1.3 (i) Develop bibliographic database to draw together and summarise scientific literature relating to the taxonomy of Procellariiformes	End March 2005	WG Chair
1.3 (ii) Prepare progress report for the first meeting of the ACAP Advisory Committee (AC1)	End June 2005	WG Chair
1.4 Develop and provide advice to AC on the construction and maintenance of species lists as appropriate	Ongoing	WG
1.5 Provide annual reports to AC on WG activities	Ongoing	WG Chair

ATTACHMENT TWO

TAXONOMY WG - PROPOSED PLAN OF ACTION

1. Consider adopting the model presented by Helbig et al. (2002) 'Guidelines for assigning species rank' to the taxa listed in the ACAP agreement.
2. Propose modifications to the Helbig model (perhaps to assist the decision-making process for allopatric seabird taxa). Discuss the desirability of using the taxonomic category of 'superspecies'.
3. Produce a draft text of a document presenting the 'Guidelines for the identification of species boundaries among taxa listed by the ACAP'.
4. Request comments on the draft version of the 'Guidelines for the identification of species boundaries among taxa listed by the ACAP' and discuss further modifications to the Helbig model. Also discuss the likely outcomes if these guidelines are stringently applied to the taxa listed by ACAP.
5. Apply the 'Guidelines' to taxa listed in the ACAP agreement beginning with those highlighted by the Scientific Committee (MOP1; ScM1; Section 4.6).
6. Recommend to the Advisory Committee a standard taxonomic reference text with all possible taxonomic synonyms for species covered by ACAP.

ATTACHMENT THREE

GUIDELINES FOR THE IDENTIFICATION OF SPECIES BOUNDARIES AMONG TAXA LISTED BY THE ACAP AGREEMENT

Draft Copy: The content of this document has not been finalized by the Working Group

Introduction

Resolution 1.5 of the First Session of the Meeting of the Parties (MOP1) to ACAP provides for the establishment by the Advisory Committee of a Working Group on the taxonomy of albatross and petrel species covered by the Agreement.

The objective of this Working Group (WG) is to establish a transparent, defensible and highly consultative taxonomic listing process. The Scientific Meeting (MOP1; ScM1; Section 4.3) stated that "...given the importance that species lists have upon conservation policy and scientific communication, taxonomic decisions must be based on robust and defensible criteria. It is important to resolve differences in a scientific and transparent manner with appropriate use of peer-reviewed publications."

The guidelines to identify species boundaries among taxa listed by ACAP are listed below. These guidelines are largely based on those presented by Helbig et al. (2002). This document should not be considered an original piece of work but an adaptation of the guidelines presented by Helbig et al. (2002).

It is worth recalling the following paragraph written by Helbig et al. (2002) when reading these guidelines:

"No species concept so far proposed is completely objective or can be used without the application of judgement in borderline cases. This is an inevitable consequence of the artificial partitioning of the continuous processes of evolution and speciation into discrete steps. It would be a mistake to believe that the adoption of any particular species concept will eliminate subjectivity in reaching decisions."

Species concepts

Helbig et al. (2002) adopts the General Lineage Concept (GLC: de Queiroz 1998; de Queiroz 1999) a concept very similar to the Evolutionary Species Concept (ESC: Mayden 1997) but stresses that "differences between concepts are largely a matter of emphasis" and that the tenets of other common concepts such as the Biological Species Concept, the Phylogenetic Species Concept (PSC: Cracraft 1983) and the Recognition Species Concept are largely encompassed by the GLC.

Helbig et al. (2002) defines species as:

"...population lineages maintaining their integrity with respect to other lineages through time and space; this means the species are diagnosably different (otherwise we could not recognize them), reproductively isolated (otherwise they would not maintain their integrity on contact) and members of each (sexual) species share a common mate recognition and fertilization system (otherwise they would not be able to reproduce)."

In contrast to the GLC, the PSC and the ESC (Wiley 1978) do not specify that species must maintain their integrity in the future.

Helbig et al. (2002) state that to produce a practical taxonomy for West Palaearctic birds the species definition must only include taxa “for which we are reasonably certain that they will retain their integrity no matter what other taxa they encounter in the future.”

The WG considers this criterion inapplicable to Procellariiformes. Procellariiforme taxa are largely allopatric and therefore we would have few data on which to base any predictions on whether taxa will remain distinct should any taxa expand their current range.

The WG will therefore restrict its considerations to only the first of the two questions posed by Helbig et al. (2002) in order to delimit species. They were:

1. Are the taxa diagnosable?
2. Are they likely to retain their genetic and phenotypic integrity in the future?

Below we list a set of guidelines the WG will use to decide if taxa are diagnosable and if they therefore warrant specific status.

Guidelines to identify species

1. Taxon diagnosis is based on characters or character states. Characters used in diagnosis must be considered, or preferably shown to have a strong genetic (heritable) component and not likely to be the product of environmental differences. Characters known to evolve rapidly in response to latitude must be considered less informative e.g. morphometrics, timing of breeding and moult patterns.
2. In the assessment of diagnostic characters the WG, whenever possible, will only consider primary data published in peer reviewed journals. Conclusions drawn by such studies must be supported by appropriate statistical analyses.
3. Once established the Taxonomy WG will aim to maintain the stability of the ACAP List of Species. Modifications to the List will only be considered when a study published in a peer-reviewed journal suggests change.
4. As stated by Helbig et al. (2002), taxa are diagnosable if:
 - a) “Individuals of at least one age/sex can be distinguished from the same age/sex class of all other taxa by at least one qualitative difference. This means that the individuals will possess one or more discrete characters that members of the other taxa lack. Qualitative differences refer to presence/absence of a feature (as opposed to a discontinuity in a continuously varying character).”
 - b) “At least one age/sex class is separated by a complete discontinuity in at least one continuously varying character (e.g. wing length) from the same age/sex class of otherwise similar taxa. By complete discontinuity we mean that there is no overlap with regard to the character in question between two taxa.” To detect a discontinuity the number of individuals compared should be based on sound judgement.
 - c) “If there is no single diagnostic character we regard a taxon as statistically diagnosable if individuals of at least one age/sex class can be clearly distinguished from individuals of all other taxa by a combination of two or three functionally

independent characters.” Body measurements are not considered independent characters.

A useful example here is the one present by Helbig et al. (2002). *Larus michahellis* and *L. armenicus* “can be distinguished by a combination of wing-tip pattern, darkness of mantle and mtDNA haplotypes, although none of these characters is diagnostic on its own.”

5. Because of the difficulties assessing reproductive isolation in allopatric taxa Helbig et al. (2002) applies more stringent criteria to allopatric than sympatric taxa. They suggest that allopatric taxa are only fully diagnosable if they differ “in each of several discrete or continuously variable characters relating to different function contexts, e.g. structural features, plumage colours, vocalisations, DNA sequences, and the sum of the character differences corresponds to or exceeds the level of divergence seen in related species that exist in sympatry.”
6. Allopatric taxa will be considered allospecies rather than full species if they do not satisfy Guideline 5 but:
 - a) At least one character is fully diagnostic and the level of divergence is equivalent to that of most closely related sympatric species, or
 - b) They are statistically diagnosable by a combination of two or three characters.

Taxa referred to as allospecies indicate that although they are unambiguously phenotypically (and genotypically) divergent, the level of divergence is less than that generally found in reproductively isolated sympatric species. This approach follows Amadon (1966) and Short (1969), and later adopted by Sibley and Monroe (1990), Helbig et al. (2002), (Shirihai 2002) and others.

References

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