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Acuerdo sobre la Conservación de Albatros y Petreles

Segunda Reunión del Comité Asesor

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Informe del Grupo de Trabajo Sobre Taxono la Segunda Reunión del Comité Asesor – Brasilia, Brasil 2006mía Presentado Ante

Autore/s: Brasil

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1. Resumen

El presente informe describe las pautas sobre toma de decisiones (Adjunto 1) aprobadas por el Grupo de Trabajo sobre Taxonomía y la aplicación de dichas pautas a tres pares de taxones"

1. Albatros de Gibson y de las Antípodas (*Diomedea antipodensis/gibsoni*)
2. Albatros de Buller y del Pacífico (*Thalassarche bulleri/platei*)
3. Albatros Tímido y de Mentón Blanco (*Thalassarche cauta/steadi*)

El Grupo de Trabajo concluye que los datos disponibles no justifican el reconocimiento de los albatros de Gibson y de las Antípodas o los albatros de Buller y del Pacífico a nivel específico. El Grupo de Trabajo recomienda la adopción de una nomenclatura sub-específica en relación a dichos taxones (comparado con la Tabla 1). A diferencia, los datos sugieren que los albatros Tímido y de Mentón Blanco son divergentes y diagnosticables y, por tanto, conforme a las pautas taxonómicas, justifican su reconocimiento a nivel específico (comparado con la Tabla 1).

El presente informe reseña la futura labor del Grupo de Trabajo sobre Taxonomía y propone que ACAP establezca una base de datos para almacenar los datos morfométricos y de plumaje a fines de facilitar la caracterización de la diversidad biológica, la identificación de los especimenes de captura secundaria, el proceso taxonómico y el almacenamiento a largo plazo de los datos importantes.

2. Antecedentes

2.1. El Artículo IX 6 (b) del Acuerdo sobre la Conservación de Albatros y Petreles (ACAP) require que el Comité Asesor "apruebe un texto de referencia estándar con un listado de la taxonomía y que mantenga un listado de los sinónimos taxonómicos de todas las especies amparadas bajo el Acuerdo". Ello refleja el estado actual del flujo en la taxonomía de Procellariiformes y, en especial, de los albatros.

2.2. La Resolución 1.5 de la Primera Sesión de la Reunión de las Partes (MOP1) de ACAP dispone el establecimiento por parte del Comité Asesor de un Grupo de Trabajo sobre la taxonomía de los albatros y petreles amparados bajo el Acuerdo.

2.3. El propósito del Grupo de Trabajo fue establecer un proceso de listado taxonómico que sea transparente, respaldable y altamente consultivo. La Reunión Científica que precedió a la Primera Reunión de las Partes (MOP1; ScM1; Sección 4.3) declaró que " … considerando la importancia que tienen las listas de especies en la política de conservación y en la comunicación científica, las decisiones taxonómicas deberán tomar como base criterios sólidos y respaldables. Es importante resolver diferencias de manera científica y transparente con el uso apropiado de publicaciones revisadas por los pares".

2.4. Se acordó durante la Reunión Científica (MOP1) que el Dr. Michael Double (Australia) presidiría el Grupo de Trabajo (en inglés, WG). Los Términos de Referencia del Grupo de Trabajo sobre Taxonomía, su composición actual y el cronograma para el progreso se encuentran incluidos en el Adjunto 2.

2.5. La Reunión Científica (MOP1; ScM1, Sección 4.6) recomendó, " … como primer paso, que el Grupo de Trabajo (sobre Taxonomía) … tenga por objeto lograr consenso en relación a las tres divisiones más contenciosas de especies de albatros; a saber *Diomedea antipodensis/gibsoni*, *Thalassarche cauta/steadi* y *T. bulleri/platei*".

3. Introducción

La política de conservación y la comunicación científica dependen considerablemente de las listas de especies debido a que se considera que dichas listas son representaciones precisas de la biodiversidad contemporánea (Isaac *et al.* 2004). Las listas de especies influyen la política de conservación y por lo tanto deben reflejar decisiones taxonómicas sólidas, consideradas y respaldables que tomen como base una evaluación completa de todos los datos de pertinencia. En la actualidad, las listas de especies correspondientes a los albatros y petreles carecen de consenso y esto pone en relieve la necesidad de que las Partes del Acuerdo sobre la Conservación de Albatros y Petreles (ACAP) aborde esta cuestión.

La taxonomía de los albatros y petreles siempre ha sido problemática. Desde mediados del siglo XVIII, se han descrito formalmente a más de 80 taxones de albatros (Robertson & Nunn 1998) con frecuencia en base a especimenes recolectados en el mar a los que no se les podía asignar localidades de reproducción. A medida que mejoraba el conocimiento sobre las localidades de reproducción y la maduración del plumaje, se reconoció a muchos de estos nuevos 'taxones' como especies previamente descriptas. Ello, a su vez, produjo debates prolongados en relación al número de especies y la precedencia de los nombres comunes y científicos (por ejemplo, Medway 1993; Robertson & Nunn 1998; Robertson & Gales 1998; Robertson 2002).

La identificación de límites de especies entre los albatros y petreles es objeto de mayor confusión debido a otros tres factores adicionales. En primer lugar, los Procellariiformes pasan la mayor parte de su tiempo en el mar y con frecuencia se reproducen en localidades remotas. Por tanto, los estudios de dichas especies son pocos y existe una carencia de datos relativos a la conducta de reproducción, la distribución en el mar y la ecología forrajera de la mayor parte de las especies (Brooke 2004). En segundo lugar, se considera que una fuerte filopatría natal es característica de la mayoría de los petreles (Warham 1990).

Esto precluye el reconocimiento de las auténticas fisiológicas o de conducta al flujo de genes debido a que es escaso el contacto entre los ejemplares de poblaciones distintas. En tercer lugar, los petreles (y, en especial, los albatros) muestran niveles de divergencia genética inusualmente bajos, incluso entre lo que pareciera ser especies muy diferentes (Nunn *et al.* 1996; Nunn & Stanley 1998). Esto inevitablemente reduce la capacidad de los estudios genéticos de delinear los límites de especies entre los taxones más estrechamente relacionados (Burg & Croxall 2001; Abbott & Double 2003b; Burg & Croxall 2004). Sin embargo, nuestro entendimiento de las especies de albatros y petreles mejora en forma constante. Los nuevos datos de los estudios demográficos a largo plazo (por ejemplo, Weimerskirch *et al.* 1997; Croxall *et al.* 1998; Cuthbert *et al.* 2003a; Nel *et al.* 2003), obtenidos de los estudios de la ecología forrajera mediante la aplicación de la tecnología de seguimiento satelital (por ejemplo, Weimerskirch *et al.* 2000; Hedd *et al.* 2001; González-Solís *et al.* 2002; Birdlife International 2004; Xavier *et al.* 2004), análisis de genética molecular (por ejemplo, Burg & Croxall 2001; Abbott & Double 2003b; Abbott & Double 2003a; Burg & Croxall 2004) y análisis morfométricos (por ejemplo, Cuthbert *et al.* 2003b; Double *et al.* 2003) todos ellos probablemente inluyan el proceso de toma de deciones taxonómicas y potencialmente el contenido de las listas de especies.

Gran parte de la confusión taxonómica actual en torno a los albatros surgió después de la publicación de un estudio filogenético de Nunn *et al.* (1996). Antes de haberse publicado dicho estudio, se consideraba que el número de especies era 14. Sin embargo, utilizando datos de Nunn *et al.* (1996) y otros datos morfométricos y de conducta, Robertson & Nunn (1998) propusieron una nueva taxonomía 'provisoria' que reconoció 24 especies de albatros. Desafortunadamente, las decisions taxonómicas presentadas en un capítulo de su libro, no siempre se veían respaldadas por datos científicos publicados y sometidos a la revisión de los pares y, por consiguiente, surgió un alto nivel de controversia en relación a dichas decisiones. A continuación de la publicación de Robertson & Nunn no ha habido consenso respecto del número de especies de albatros, entre los científicos, los gobiernos o las organizaciones dedicadas a la conservación. Por ejemplo, de los dos libros más recientes que tratan la taxonomía de los albatros, un libro describió 24 especies (Shirihai 2002) mientras que el otro reconoció sólo 21 (Brooke 2004). De igual modo, Birdlife International incluye en su listado 21 especies de albatros (www.birdlife.net) mientras que la lista preliminar de especies de ACAP toma como base a dos taxonomías de 14 y 24 especies (www.acap.aq). Sólo recientemente Penhallurick y Wink (2004) revisaron los datos genéticos publicados por Nunn *et al.* (1996) y argumentaron que dichos datos respaldaban el reconocimiento de solamente 13 especies de albatros. La lógica científica adoptada por Penhallurick & Wink (2004) se vio criticada por Rheindt & Austin (2005) quienes argumentaron que otros estudios genéricos posteriores (por ejemplo, Burg & Croxall 2001; Abbott & Double 2003a; Burg & Croxall 2004) no considerados por Penhallurick & Wink (2004) respaldaban el reconocimiento de por lo menos algunas de las 'nuevas especies' propuestas por Robertson & Nunn (1998).

Probablemente sea una meta no lograble establecer un consenso taxonómico. Sin embargo, el Grupo de Trabajo sobre Taxonomía considera que la confusión taxonómica actual existe primordialmente a causa de una combinación de tres factores. En primer lugar, tal como se lo explicara anteriormente, la identificación de los límites de especies entre los albatros y los petreles es difícil de realizar. En segundo lugar, la veracidad del proceso de revisión por pares es variable y el proceso en sí es falible. Por tanto, desafortunadamente, se ha publicado en la bibliografía científica recomendaciones taxonómicas que son menos que sólidas y las mismas se han replicado en fuentes secundarias derivativas tales como los manuales y las guías para el trabajo en campo. En tercer lugar, los científicos, las agencias gubernamentales y los organismos dedicados a la conservación han adoptado taxonomías especiales y a menudo muy distintas sin una justificación adecuada.

Dicha falta aparente de rigor científico y de coherencia taxonómica fue reconocida en ocasión de la última Conferencia Internacional sobre Albatros y Petreles realizada en Montevideo, Uruguay en 2004. Los delegados que asistieron a la conferencia aprobaron una presentación por la cual se alentaba a que ACAP tratara dichos problemas 'mediante el establecimiento de un proceso de inclusión en lista que sea transparente, respaldable científicamente y altamente consultativo. Dicho proceso deberá promover la estabilidad taxonómica pero también deberá permitir la revisión cada vez que los estudios sólidos de revisión de los pares sugieran que es necesario proceder con enmiendas'. Actuando en base a las recomendaciones incluidas en dicha presentación, la Resolución 1.5 de la Primera Reunión de las Partes de ACAP (MOP1) dispuso el establecimiento de un Grupo de Trabajo (GT) a fines de revisar la taxonomía de todas las especies actuales incluidas en lista bajo el Acuerdo (Anexo 1). La composición actual y los Términos de Referencia del GT se presentan en el Adjunto 2.

La primera acción del GT fue establecer acuerdo respecto de un conjunto de pautas para la toma de decisiones taxonómicas (Adjunto 1). Dichas pautas toman como base aquellas descriptas por Helbig *et al.* (2002) del Sub-Comité de Taxonomía de la Unión Británica de Ornitólogos y que justifican la adopción de un concepto de especies en particular y hace que el proceso de toma de decisiones sea transparente. Dichas pautas facilitan la evaluación y la asimilación de estudios potencialmente influyentes, protegiéndose a la misma vez de los estudios que constituyen una ciencia precaria. Las pautas también consideran las limitaciones inevitables de las listas de especies y los beneficios de la estabilidad taxonómica.

3.1. La Reunión Científica (MOP1; ScM1, Sección 4.6) recomendó " … como primer paso, que el Grupo de Trabajo (sobre Taxonomía) … tenga por objeto lograr consenso en relación a las tres divisiones más contenciosas de especies de albatros; a saber *Diomedea antipodensis/gibsoni*, *Thalassarche cauta/steadi* y *T. bulleri/platei*". En el presente informe, el GT resume y evalúa los datos científicos pertinentes a dichos tres grupos de taxones y propone que los datos no respalda en la actualidad el reconocimiento de los albatros de Gibson o de las Antípodas (*Diomedea antipodensis/gibsoni)* o los albatros de Buller y del Pacífico *(Thalassarche bulleri/platei)* a nivel específico. Sin embargo, el GT reconoce que los datos sugieren que los albatros Tímido y de Mentón Blanco son divergentes y diagnosticables y, por tanto, en base a las pautas taxonómicas, justifican su reconocimiento a nivel específico. La justificación de dichas decisiones se presenta a continuación. La lista actualizada de taxones reconocida por el Grupo de Trabajo de ACAP sobre Taxonomía se presenta en la Tabla 1.

4. Justificación de las decisiones taxonómicas

4.1. Albatros de las Antípodas y de Gibson

Por razones de conveniencia, a veces se hace referencia a los albatros de las Antípodas y de Gibson simplemente como *antipodensis* y *gibsoni* respectivamente.

Historia taxonómica reciente

Durante mucho tiempo ha habido un debate sobre la taxonomía del grupo de Albatros Errantes (del tipo exulans). En 1983 Roux et al. (1983) propusieron que los albatros del tipo exulans que se reproducen en la Isla Amsterdam en el Océano Índico era una especie distinta (*Diomedea amsterdamensis*). Posteriormente, Warham (1990), en su obra seminal sobre petreles, relegó *amsterdamensis* a una sub-especie y reconoció a otras 4: *Diomedea exulans exulans*, *D. e. chionoptera*, más dos otras en fecha posterior descriptas como *D. e. antipodensis* y *D. e. gibsoni* por Robertson & Warham (1992). En base a las reglas de precedencia taxonómica Medway (1993) sostuvo que las formas grandes de alta latitud deberían llamarse *D. e. exulans* (en reemplazo de *chionoptera*) mientras que las aves más pequeñas del grupo de Tristan-Grough deberían llamarse *D .e. dabbenena (*en reemplazo de *exulans)*. Robertson & Nunn (1998) no adoptaron dicha nomenclatura cuando reconocieron cinco especies de Albatros Errante (*Diomedea exulans*; *D. chionoptera*; *D. amsterdamensis*; *D. antipodensis* y *D. gibsoni*) pero en el mismo libro (Robertson & Gales 1998), Gales (1998) y Croxall & Gales (1998) siguen la nomenclatura de Medway (1993) pero también reconocen 5 especies (*Diomedea exulans*; *D. dabbenena*; *D. amsterdamensis*; *D. antipodensis* y *D. gibsoni*). La mayor parte de las organizaciones pertinentes, así como las publicaciones recientes reconocen en la actualidad como especies enteras a *Diomedea exulans*, *D. dabbenena* y *D. amsterdamensis* (por ejemplo, Shirihai 2002; Birdlife International 2004; Brooke 2004; pero véase también Penhallurick & Wink 2004), sin embargo, el tratamiento de *D. antipodensis* y *D. gibsoni* varía en la actualidad entre conespecíficos, sub-especies, alloespecies y especies (por ejemplo, Holdaway *et al.* 2001; Shirihai 2002; Brooke 2004; Elliott & Walker 2005) .

Publicaciones o revisiones primarias de los datos pertinentes a la taxonomía de los albatros de Gibson y de las Antípodas

1. **Robertson & Warham (1992)** first proposed *Diomedea exulans gibsoni* (Auckland Islands) and *D. e. antipodensis* (Antipodes and Campbell Islands) as subspecies and provided descriptions of type specimens. They also presented a summary of Gibson Plumage Scores (Gibson 1967) for *antipodensis* (male: mean = 8.7 ± 1.6 (5.5 – 11.5), N = 43; female: mean = 4.4 ± 0.5 (4 – 6), N = 45) and *gibsoni* (male: mean = 14.2 ± 2.4 (10.5 – 19), N=12; female: mean = 10.2, ± 1.5 (7.5 – 12), N = 9) taken from birds on their breeding islands.
2. **Robertson & Warham (1994)** presented morphometric data from *antipodensis* and *gibsoni* sampled at their breeding locations. No formal statistical analysis was provided but measures from each taxon overlapped considerably within sexes for each body part.
3. **Nunn *et al.* (1996)** did not include DNA sequence data from either *antipodensis* or *gibsoni* in their analyses but provided convincing justification for splitting the genus *Diomedea* into *Diomedea*, *Thalassarche* and *Phoebastria*.
4. **Robertson & Nunn (1998)**, the highly influential book chapter proposing 24 albatross species, stated “the New Zealand Wandering Albatrosses are diagnosable morphologically and ecologically as two distinct taxa (*gibsoni* and *antipodensis*)…”. No evidence was provided to justify this statement or why these taxa should be recognised as species rather than subspecies.
5. **Nunn & Stanley (1998)** found a single base difference in 1143 base pairs of mitochondrial cytochrome b gene DNA sequence. Only one *gibsoni* and one *antipodensis* sequences were examined. Given the level of divergence and the number of samples examined, this study provides little taxonomic information.
6. **Walker & Elliott (1999)** presented detailed morphometric data for *gibsoni* sampled at the breeding sites but no comparison was made to data from other *Diomedea*. They also summarised the laying period of *gibsoni* (29th Dec – 5th Feb; median 4th – 7th Jan) which they stated is “three weeks later than its near neighbour *D. e.*

antipodensis". Data for *antipodensis* were not provided but this appears to be a mistake. Walker & Elliott (2005) report the median laying date of *gibsoni* to be three weeks earlier than *antipodensis* (see below).

7. **Cuthbert *et al.* (2003b)** primarily considered morphometric data from Tristan Albatross (*Diomedea dabbenena*) and show they are distinct from high latitude *Diomedea exulans*. They also provided a simple summary of morphometric data for these taxa plus those for *gibsoni* and *antipodensis* from Onley & Bartle (1999) and Walker & Elliott (1999). Measurements for *gibsoni* and *antipodensis* were similar but difficult to assess without formal statistical analyses.
8. **Burg & Croxall (2004)**, in a study of mitochondrial control region DNA sequences, detected three distinct lineages within the Wandering Albatross group. These lineages were concordant with *Diomedea exulans*, *D. dabbenena* and the New Zealand *Diomedea* (*gibsoni* and *antipodensis*). The Amsterdam Albatross (*D. amsterdamensis*) was not included in this study. No fixed differences in the mtDNA sequences between *gibsoni* and *antipodensis* were found, but significant differentiation was discovered in population genetic analyses using microsatellite-based analyses. No structure was found among the disparate populations of *D. exulans* although not all island populations were included in this study. Based on these data, Burg and Croxall suggested *gibsoni* and *antipodensis* should be considered conspecifics.
9. **Walker & Elliott (2005)** reported the median lay date for *antipodensis* was between the 23rd and 26th Jan (range: 7th Jan – 17th Feb), three weeks later than *gibsoni* (Walker & Elliott 1999).

Assessment of diagnosibility (cf. Attachment One; Section3)

Based on data provided in the studies described above:

A. Same age/sex individuals of *gibsoni* and *antipodensis* **cannot** be distinguished by one or more qualitative differences.
B. Same age/sex individuals of *gibsoni* and *antipodensis* **cannot** be distinguished by a complete discontinuity in one or more continuously varying characters.
C. Same age/sex individuals of *gibsoni* and *antipodensis* **cannot** be distinguished by a combination of two or three functionally independent characters.

Decision

These taxa fail to meet any of the diagnosibility criteria described in Attachment One. We therefore recommend that these taxa do not warrant specific status. We do, however, recognise that: 1) little or no gene flow occurs between *gibsoni* and *antipodensis* (Burg & Croxall 2004), 2) that *antipodensis* tend to be darker than *gibsoni* (Robertson & Warham 1992) and 3) that it is likely *antipodensis* forage more frequently in the eastern Pacific whereas *gibsoni* tend to forage in the Tasman Sea (Walker *et al.* 1995; Nicholls *et al.* 1996; Birdlife International 2004).To acknowledge these biological characteristics and provide ACAP with a practical list of taxa that can facilitate the presentation of taxon-specific information we recommend that these taxa are recognised as subspecies (*cf.* Table One):

Diomedea antipodensis antipodensis (Antipodean Albatross)
Diomedea antipodensis gibsoni (Gibson's Albatross)

This nomenclature is justified by Burg & Croxall (2004) and Brooke (2004).

Comments

We acknowledge that those scientists who have worked most closely with these taxa advocate that they are treated as either subspecies (Walker & Elliott 1999) or, most recently, as species (Elliott & Walker 2005; Walker & Elliott 2005). The ACAP Taxonomy Working Group will carefully consider all future publications that describe the biology of these taxa and will revisit this decision when appropriate. To facilitate taxonomic decisions and, importantly, the identification of bycatch specimens or albatrosses at-sea, a detailed quantitative comparative analysis of morphometric and plumage (adult and subadult) data for these taxa would be highly valuable as would a detailed presentation of their foraging distribution.

4.2. Buller's and Pacific Albatrosses

For convenience Buller's and Pacific Albatrosses are sometimes referred to simply as *bulleri* and *platei* respectively.

Recent taxonomic history

Robertson & Nunn (1998) proposed that the subspecies *Thalassarche bulleri platei* (Murphy 1936) breeding on the Chatham and Three Kings Islands and those breeding on the Solander and Snares Islands (*T. bulleri bulleri*) should be treated as distinct species (*T. platei* and *T. bulleri* respectively). *T. platei* is also referred to as *T. sp. nov*. because Robertson & Nunn (1998) suggested the type specimen for *T. platei* is in fact a juvenile *T. bulleri*.

Primary publications or reviews of data relevant to the taxonomy of Buller's and Pacific Albatrosses

1. **Nunn *et al.* (1996)** only included DNA sequence data from *bulleri* but provided convincing justification for the placement of Buller's Albatrosses in the genus *Thalassarche*. Similarly, no molecular data for *platei* were presented in Nunn & Stanley (1998)**.**
2. **Robertson & Nunn (1998)**, in justification for the recognition of two species, state "In the case of *T. bulleri* breeding is two months later at The Snares and Solander Islands than at the Chatham Islands (*T. platei*) and incubation stints are about three times the length." No primary data sources were cited to justify these assertions.
3. **Tickell (2000)** summarised data available for *bulleri* and *platei* (but no primary sources were cited) and showed that all measurements overlap considerably. To our knowledge no statistical analyses of morphometric data have been published for these taxa.

Assessment of diagnosibility (cf. Attachment One; Section3)

Based on data provided in the studies described above:

A. Same age/sex individuals of *bulleri* and *platei* **cannot** be distinguished by one or more qualitative differences.
B. Same age/sex individuals of *bulleri* and *platei* **cannot** be distinguished by a complete discontinuity in one or more continuously varying characters.
C. Same age/sex individuals of *bulleri* and *platei* **cannot** be distinguished by a combination of two or three functionally independent characters.

Decision

These taxa fail to meet any of the diagnosibility criteria described in Attachment One. We therefore recommend that these taxa do not warrant specific status. Very few data are available for *T. platei* and currently there is little justification for recognition even at the subspecific level, however, appear widely accepted in the scientific literature (por ejemplo, Marchant & Higgins 1990; Holdaway *et al.* 2001; Brooke 2004). At this stage we recommend that these taxa are recognised as subspecies (*cf.* Table One). We concede that this decision is highly questionable. However, genetic research currently being conducted at Victoria University, Wellington, N.Z. may shed light on the taxonomic standing of these taxa. Once published, we will consider the implications of this research and review these taxa again prior to the next Meeting of Parties. In he meantime we recommend they are listed as follows:

Thalassarche bulleri bulleri (Buller's Albatross)
Thalassarche bulleri platei (Pacific Albatross)

This nomenclature follows Brooke (2004). The nomenclature for *T. b. platei* is likely to change when an appropriate type specimen is formally described.

Comments

Very few comparative data are available for these taxa and there is a misconception that molecular data exists that justifies the recognition of these taxa as species (Shirihai 2002). To our knowledge no comparative molecular data, morphometric data and quantitative plumage descriptions are currently available. To facilitate taxonomic decisions and, importantly, the identification of bycatch specimens or albatrosses at-sea, a detailed quantitative comparative analysis of genetic, morphometric and plumage (adult and subadult) data for these taxa would be highly valuable as would a detailed presentation of their foraging distribution.

4.3. Shy and White-capped Albatrosses

For convenience Shy and White-capped Albatrosses are sometimes referred to simply as *cauta* and *steadi* respectively.

Recent taxonomic history

Prior to Robertson & Nunn (1998) these taxa were classified as either separate subspecies (*T. c. cauta* and *T. c. steadi*) or pooled as single subspecies (*T. cauta cauta*) within the Shy Albatross (*Thalassarche cauta*) complex (por ejemplo, Marchant & Higgins 1990). Chatham Albatrosses (*Thalassarche cauta eremita*) and Salvin's Albatrosses (*T. c. salvini*) were also included in this complex. Robertson & Nunn (1998) elevated all four subspecies to specific status.

Primary publications or reviews of data relevant to the taxonomy of Shy and White-capped Albatrosses

1. **Nunn *et al.* (1996)** only included DNA sequence data from a *T. cauta* but provided convincing justification for the placement of Shy Albatrosses in the genus *Thalassarche*. Similarly, no molecular data for *steadi* were presented in Nunn & Stanley (1998)**.**

2. **Brothers *et al.* (1997)** used band recoveries and sighting of colour marked birds to show subadult (< five years old) *cauta* can venture as far as South African waters but adults were always recovered in Australian waters.
3. **Brothers *et al.* (1998)** used satellite telemetry to show adult *cauta* remain in southern Australian waters close to their breeding islands both inside and outside the breeding season (see also Hedd *et al.* 2001).
4. **Robertson & Nunn (1998)** justified the recognition of shy and white-capped Albatrosses as follows: "*T. cauta* and *T. steadi* can be differentiated by wing morphometrics which do not overlap, though other differences are less clear cut." No primary data sources were cited to justify this statement and was later shown to be false by Double *et al.* (2003).
5. **Ryan et al. (2002)** reported that of an estimated 19 – 30,000 seabirds killed by longliners in South African waters, 69% were albatrosses. Of these, approximately 64% were shy-type albatrosses. Equal numbers of adult and subadult shy-type albatrosses were present among those birds returned to port for identification. Later genetic analyses suggested that *steadi* dominate the shy-type albatrosses killed by longline fisheries operating in South African waters (100% *steadi*, N= 24, Abbott *et al.* in press).
6. **Double *et al.* (2003)** presented within-sex comparisons of morphometric data from *T. cauta* and *T. steadi* bycatch specimens identified using a DNA-based test (Abbott & Double 2003b). Of 10 body measurements, 6 were significantly different between *cauta* and *steadi* for both sexes. All measurements overlapped but in combination could be used to correctly identify approximately 90% (N=70) of specimens. Also yellow colouration at the base of the culmen was found in 86% of adult *cauta* specimens but was never recorded among adult *steadi*.
7. **Abbott & Double (2003a),** based on a study of microsatellite allele frequencies, report very strong population differentiation between *cauta* and *steadi* and suggest contemporary gene flow does not occur or is extremely rare.
8. **Abbott & Double (2003b)** used DNA sequencing of the mitochondrial control region to show *cauta* and *steadi* are very closely related. However, *cauta* and *steadi* did not share any of the 37 haplotypes (sequence types) recovered.
9. **Abbott *et al.* (in press)** used a DNA-based test to identify shy-type (*cauta* or *steadi*) bycatch specimens returned from Australian, South African and New Zealand fisheries. No *cauta* were detected outside Australian waters. Adult and subadult *T. steadi* were identified from Australian waters and all adult and subadults recovered from South African and New Zealand waters were *steadi*.

Assessment of diagnosibility (cf. Attachment One; Section3)

Based on data provided in the studies described above:

A. Same age/sex individuals of *T. cauta* and *T. steadi* **can** be distinguished by one or more qualitative differences.
B. Same age/sex individuals of *T. cauta* and *T. steadi* **cannot** be distinguished by a complete discontinuity in one or more continuously varying characters.
C. Same age/sex individuals of *T. cauta* and *T. steadi* **can** be distinguished by a combination of two or three functionally independent characters.

Decision

These taxa satisfy two of the diagnosibility criteria described in Attachment One: Section 3, Criterion A: taxa can be separated by a single qualitative trait (mitochondrial sequences); Section 3, Criterion C: using a combination of two independent traits (morphometric measurements and bill coloration) all adults can be accurately diagnosed. We also recognise that taxa have been shown to be genetically distinct and behave differently. Adult *steadi* disperse widely outside the breeding season and frequently reach South African waters. In contrast, adult *cauta* always remain close to their breeding islands. Also despite *steadi* being very common in the Australian waters close to the breeding colonies of *cauta*, no gene flow is detectable. We therefore recommend that these taxa warrant specific status. These taxa are recognised as follows (*cf.* Table One):

Thalassarche cauta (Shy Albatross)
Thalassarche steadi (White-capped Albatross)

This nomenclature follows Robertson & Nunn (1998).

Comments

These studies clearly show that *T. cauta* and *T. steadi* have diverged recently in evolutionary terms but the fact that they are divergent is indisputable. This divergence, however, has not been manifested in a plumage difference immediately apparent to a human observer. This is, in our opinion, the primary reason why many are reluctant to recognise *cauta* and *steadi* either at the subspecific or specific level. In contrast, Chatham and Salvin's Albatrosses (*T. eremita* and *T. salvini*) show a similar level of genetic divergence (Abbott & Double 2003b) to *cauta* and *steadi* but because plumage differences between adult are immediately apparent they are more commonly recognised as 'good species'. In our opinion this approach is inconsistent, anthropocentric, and will underestimate biological diversity. To facilitate later taxonomic assessments and, importantly, the identification of bycatch specimens or albatrosses at-sea, a detailed quantitative comparative analysis of subadult plumage for these taxa would be highly valuable as would a more detailed study of the foraging distribution of adult *steadi* and of subadults of both species.

5. Futura labor del Grupo de Trabajo de ACAP sobre Taxonomía

Ninguna lista de especies debería ser estática y el Grupo de Trabajo de ACAP sobre Taxonomía considerará con suma atención todas las futuras publicaciones que describan la biología de los albatros y petreles y también volverá a tratar todas las decisiones adoptadas, según corresponda.

Dicho proceso taxonómico no es sólo útil para preparar una lista de especies de ACAP que sea práctica, respaldable y coherente, sino que también es útil para resumir los datos disponibles y poner en relieve nuestro conocimiento biológico actual. Por consiguiente, el Grupo de Trabajo de ACAP sobre Taxonomía es de la opinión que como primera medida deberá considerar todos los siguientes pares de taxones con anterioridad a la próxima reunión del CA:

1. Albatros de Buller y del Pacífico
2. Albatros Real Antártico y Real Subantártico
3. Albatros de Pico Fino del Océano Índico y de Pico Fino del Océano Atlántico
4. Albatros de Chatham y de Salvin
5. Petreles Gigantes Antárticos y Subantárticos

6. Petreles Negro y de Nueva Zelanda
7. Petreles de Mentón Blanco y de Antifaz

El Grupo de Trabajo también cuestionará si el rango de subespecie refleja la diversidad genética en las aves marinas procellariiformes (véase la revisión de Phillimore & Owens 2006), y de ser así, desarrollará pautas taxonómicas para el reconocimiento del estado sub-específico.

En la genética, casi la mayoría de las secuencias de ADN publicadas se presentan en una base de datos de búsqueda pública que se basa en la red electrónica (por ejemplo, www.ncbi.nih.gov). Dicha clase de enfoques permite que los datos estén disponibles en forma permanente para la revisión y el re-análisis (por ejemplo, Penhallurick & Wink 2004; Alderman *et al.* 2005), y de esa manera no se pierde ninguna información cuando los investigadores se jubilan o los mecanismos de almacenamiento de datos quedan obsoletos.

BirdLife International ha adoptado un enfoque similar ya que en la actualidad ellos archivan datos de seguimiento satelital extremadamente importantes relativos a las aves marinas procellariiformes recolectadas por parte de 18 grupos de investigación provenientes de 9 países. No se puede presentar dichos datos en su totalidad en las presentaciones científicas y la información se pierde inevitablemente cuando se realiza un resumen de los datos. El Grupo de Trabajo de ACAP sobre Taxonomía propone que ACAP debería considerar el desarrollo de una base de datos de archivo correspondiente a las características morfométricas y de plumaje de las especies incluidas en lista y de ponerse en comunicación con los investigadores a fines de que ellos presenten sus datos a dicha base de datos. Dicho base de datos facilitará la caracterización de la diversidad biológica, la identificación de los especimenes de captura secundaria, el proceso taxonómico y el almacenamiento a largo plazo de dichos datos tan importantes.

6. Tablas

TablA 1. lista estándar propuesta para el reconocimiento de taxones por las partes del acuerdo para la conservación de albatros y petreles (ACAP)

Familia DIOMEDEIDAE Albatrosses

1	*Diomedea exulans*	Albatros Errante
2	*Diomedea dabbenena*	Albatros de Tristán
3	*Diomedea antipodensis antipodensis*	Albatros de las Antípodas
4	*Diomedea antipodensis gibsoni*	Albatros de Gibson
5	*Diomedea amsterdamensis*	Albatros de Ámsterdam
6	*Diomedea epomophora*	Albatros Real Antártico o del Sur
7	*Diomedea sanfordi*	Albatros Real Subantártico o del Norte
8	*Phoebastria irrorata*	Albatros Ondulado
9	*Thalassarche cauta*	Albatros Tímido
10	*Thalassarche steadi*	Albatros de Mentón Blanco
11	*Thalassarche salvini*	Albatros de Salvin
12	*Thalassarche eremita*	Albatros de Chatham
13	*Thalassarche bulleri bulleri*	Albatros de Buller
14	*Thalassarche bulleri platei.*	Albatros del Pacífico
15	*Thalassarche chrysostoma*	Albatros de Cabeza Gris
16	*Thalassarche melanophris*	Albatros de Ceja Negra
17	*Thalassarche impavida*	Albatros de Campbell
18	*Thalassarche carteri*	Albatros de Pico Fino Amarillo del Océano Índico
19	*Thalassarche chlororhynchos*	Albatros de Pico Fino Amarillo del Océano Atlántico
20	*Phoebetria fusca*	Albatros Oscuro
21	*Phoebetria palpebrata*	Albatros de Manto Claro

FamilIA procellariidae - PetrelEs

22	*Macronectes giganteus*	Petrel Gigante Antártico
23	*Macronectes halli*	Petrel Gigante Subantártico
24	*Procellaria aequinoctialis*	Petrel de Mentón Blanco
25	*Procellaria conspicillata*	Petrel de Antifaz
26	*Procellaria parkinsoni*	Petrel Negro
27	*Procellaria westlandica*	Petrel de Nueva Zelanda
28	*Procellaria cinerea*	Petrel Gris

Los taxones considerados en el presente informe figuran con sombrado en color gris.

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Attachment One

Guidelines for the identification of species boundaries among taxa listed by the Agreement on the conservation of albatrosses and petrels (ACAP)

Taxonomic Working Group of ACAP

1. 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."*

2. Species concepts

Helbig *et al.* (2002) adopt 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.

The General Lineage Concept 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).”* (Helbig *et al.* 2002)

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 difficult or impossible to apply to predominantly allopatric taxa such as procellariiform seabirds. The WG 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?

By adopting this strategy the WG applies the less stringent GLC (de Queiroz 1998; de Queiroz 1999) and ESC (Wiley 1978) which recognise species that are currently maintaining their integrity but “do not require species to maintain their integrity in the future” (Helbig *et al.* 2002).

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

3. Guidelines to identify species (Diagnosibility)

3.1. 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 por ejemplo, morphometrics, timing of breeding and moult patterns.

3.2. 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. Once established the Taxonomy WG will aim to maintain the stability of the ACAP List of Taxa. Modifications to the List will only be considered when a study published in a peer-reviewed journal suggests change.

3.3. 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 (por ejemplo, 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 presented 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."

3.4. Because of the difficulties assessing reproductive isolation in allopatric taxa Helbig *et al.* (2002) apply more stringent criteria to allopatric than sympatric taxa. They suggest that allopatric taxa should be recognised as species only if "they are fully diagnosable in each of *several* discrete or continuously variable characters relating to different function contexts, por ejemplo, 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."

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Attachment Two

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 of progress

The following timetable has been updated since the first meeting of the ACAP Advisory Committee (AC1).

Action	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
1.3 (ii) Prepare progress report for the second meeting of the ACAP Advisory Committee (AC2)	End May 2006	WG Chair
1.5 Develop and provide advice to AC on the construction and maintenance of species lists as appropriate	Ongoing	WG
1.6 Provide annual reports to AC on WG activities	Ongoing	WG Chair