Agreement on the Conservation of Albatrosses and Petrels

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Title: The Red List Index for species covered by the Agreement on the Conservation of Albatrosses and Petrels

Author: BirdLife International

**The Red List Index for species covered by the
Agreement on the Conservation of Albatrosses and Petrels**

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Summary

The Red List Indices (RLI) for ACAP-listed species, all seabirds and for all birds are summarised from 1988 to 2008. Overall the seabird index has decreased somewhat faster than the index for all birds. The index for ACAP-listed species shows that this group is substantially more threatened than either and has decreased particularly rapidly over the last 20 years. However the RLI for 2008 has not changed relative to the last major RLI assessment in 2004.

Introduction

In respect of developing indicators to measure the success of ACAP, the second Meeting of Parties (2006) agreed that relevant IUCN Red List Indices would be used as an interim indicator. At the fourth meeting of the ACAP Advisory Committee (2008) BirdLife International was requested to provide the latest version of the relevant indicators, following the major 4-yearly revision of the IUCN Red List for birds earlier that year (BirdLife International 2008b).This paper seeks to provide that information, prefaced by a summary of the background to, and current uses of, the Red List Index.

IUCN Red List Index

The IUCN Red List is widely recognised as the most authoritative and objective system for classifying species by their risk of extinction (see, e.g. Regan *et al.* 2005, de Grammont and Cuarón, 2006, Rodrigues *et al.* 2006). It uses quantitative criteria based on population size, rate of decline, and area of distribution to assign species to categories of relative extinction risk (IUCN 2001). The criteria are clear and comprehensive but are sufficiently flexible to deal with uncertainty (Akçakaya *et al.* 2000). The assessments are not simply based on expert opinion; they must be supported with detailed documentation of the best available data, with justifications, sources, and estimates of uncertainty and data quality (IUCN 2008). Red List Authorities (e.g. BirdLife International for birds) are appointed to organise independent scientific review and to ensure consistent categorisation between species, groups, and assessments. A Red List Standards and Petitions Subcommittee monitors the process and resolves challenges and disputes to listings. A coordinated global program is overseen by partner organisations including the IUCN Species Survival Commission, BirdLife International, NatureServe, and the Center for Applied Biodiversity Science at Conservation International.

The Red List Index (RLI) has been developed as an indicator of trends in the status of biodiversity. It illustrates the rate of biodiversity loss in terms of the rate that species are slipping towards (or away from) extinction. The index is based on the number of species in different categories of extinction risk on the IUCN Red List, and the movement of species between categories owing to genuine improvements or deteriorations in status (Butchart *et al.* 2004, 2005, 2007). The RLI integrates the net impacts of species improving in status and being downlisted to lower categories of threat (usually a consequence of conservation interventions) and those deteriorating in status and being uplisted to higher categories of threat (owing to declining populations and increasing threats).

RLI values relate to the proportion of species expected to remain extant in the near future without additional conservation action. An RLI value of 1.0 equates to all species being

categorised as Least Concern, and hence that none is expected to go extinct in the near future. An RLI value of zero indicates that all species have gone Extinct. A downwards trend in the graph line (i.e. decreasing RLI values) means that the expected rate of species extinctions is increasing, i.e. that the rate of biodiversity loss is increasing. A horizontal graph line (i.e. unchanging RLI values) means that the expected rate of species extinctions is unchanged. An upward trend in the graph line (i.e. increasing RLI values) means that there is a decrease in expected future rate of species extinctions (i.e. a reduction in the rate of biodiversity loss).

As well as monitoring global trends, the RLI can be disaggregated to compare trends for suites of species in different biogeographic regions, ecosystems, habitats, taxonomic subgroups or relevant to different international treaties.

The RLI has been widely recognised and recommended as one of the suite of indicators needed to track progress towards the 2010 target (Brooks and Kennedy 2004, Millennium Ecosystem Assessment 2005, Pereira and Cooper 2006, Secretariat of the Convention on Biological Diversity 2006, UNEP 2006). An indicator on 'trends in the status of threatened species' was selected for 'immediate testing' by the CBD Subsidiary Body on Scientific, Technical and Technological Advice (Secretariat of the CBD 2005), and the RLI is used to report on the indicator 'proportion of species threatened with extinction' under the United Nations Millennium Development Goal seven (United Nations 2008).

In addition, RLIs based on the relevant sets of species are being used or considered by a number of thematic or regional agreements or policy mechanisms, including the Ramsar Convention on Wetlands (Ramsar Convention 2008), the Convention on Migratory Species (CMS; CMS 2005), the African-Eurasian Waterbird Agreement under the CMS (Wetlands International 2008), and the Streamlining European Biodiversity Indicators-2010 (SEBI-2010) initiative (European Environment Agency 2007).
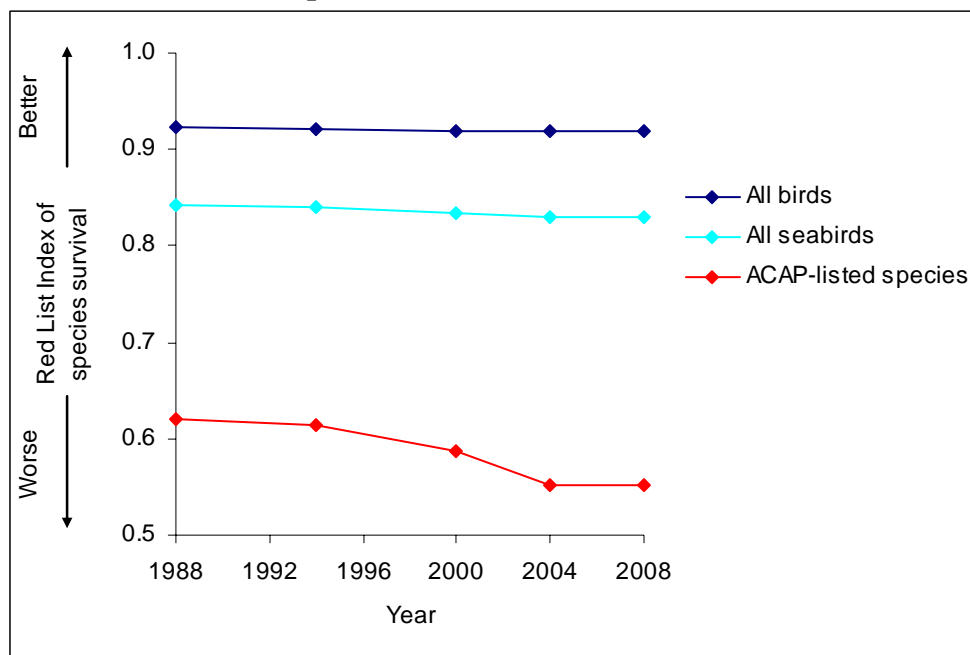
RLI for ACAP-listed species

Figure 1. Red List Index of species survival for all bird species (n=9,799 non-Data Deficient species extant in 1988), all seabirds (n=337) and ACAP-listed species (n=29). RLI values relate to the proportion of species expected to remain extant in the near future without additional conservation action. An RLI value of 1.0 equates to all species being categorised as Least Concern, and hence that none are expected to go extinct in the near future. An RLI value of zero indicates that all species have gone Extinct.

The RLI for seabirds shows that overall, they are more threatened than birds (i.e. RLI values are lower), and that their status has deteriorated marginally faster (i.e. the RLI slope is steeper). Among seabirds, the RLI for the 29 species listed on the appendix of the Agreement on the Conservation of Albatrosses and Petrels (ACAP) shows that they are substantially more threatened on average, and have deteriorated in status particularly steeply. Underlying data on threats to these species held in BirdLife International's World Bird Database shows that this reflects the impacts of bycatch (particularly in commercial long-line fisheries) in combination with other threats such as invasive species at breeding colonies (BirdLife International 2008a).

It is noteworthy that the 2008 RLI value for ACAP-listed species shows no further deterioration in the status of these species since 2004. This is partly because although many of these species are continuing to undergo declines and/or they are suffering intensifying threats, these changes are not yet substantial enough for the species to cross the thresholds for uplisting to higher categories of threat. It is also possible that some changes in status of sufficient magnitude have occurred, but the data have not yet been collected/made available/analysed/ published and incorporated into the Red List assessments.

As an indicator, the RLI has moderate sensitivity: it is not highly sensitive to small-scale changes in the status of species (as may be picked up by population trend-based indicators). However, it has global scope and coverage, and hence is not biased by data availability in the way that population trend-based indicators may be. For the RLI for ACAP, all the listed species are included in the index, which integrates overall trends for the complete suite of species. Until moderately comprehensive datasets are available representing a good coverage of species listed under ACAP, and good coverage of each species' geographic range, the RLI presented here represents the best available tool for tracking trends in the suite of species covered by the Agreement.

References

Akçakaya, H. R., Ferson, S., Burgman, M. A., Keith, D. A., Mace, G. M. and Todd, C. A. (2000) Making consistent IUCN classifications under uncertainty. *Conserv. Biol*. 14: 1001–1013.

BirdLife International (2000) *Threatened birds of the world*., Cambridge, UK and Barcelona, Spain: BirdLife International and Lynx Edicions.

BirdLife International (2004) *Threatened birds of the world 2004*. CD-ROM. Cambridge, UK: BirdLife International.

BirdLife International (2008a) *State of the world's birds 2008*. Cambridge, UK: BirdLife International.

BirdLife International (2008b) *Threatened birds of the world 2008*. CD-ROM. Cambridge, UK: BirdLife International.

Brooks, T. and Kennedy, E. (2004) Biodiversity barometers. *Nature* 431: 1045–1046.

Butchart, S. H. M., Stattersfield, A. J., Bennun, L. A., Shutes, S. M., Akçakaya, H. R., Baillie, J. E. M., Stuart, S. N., Hilton-Taylor, C. and Mace, G. M. (2004) Measuring global trends in the status of biodiversity: Red List Indices for birds. *Public Lib. Sci. Biol*. 2: 2294–2304.

Butchart, S. H. M., Stattersfield, A. J., Bennun, L. A., Akçakaya, H. R., Baillie, J. E. M., Stuart, S. N., Hilton-Taylor, C. and Mace, G. M. (2005) Using Red List Indices to measure progress towards the 2010 target and beyond. *Phil. Trans. Roy. Soc*. 1454: 255–268.

Butchart, S. H. M., Akçakaya, H. R., Chanson, J., Baillie, J. E. M., Collen, B., Quader, S., Turner, W. R., Amin, R., Stuart, S. N., Hilton-Taylor, C. and Mace, G. M. (2007) Improvements to the Red List Index. *Public Lib. Sci. One* 2(1): e140. doi:10.1371/journal.pone.0000140

Collar, N. J. and Andrew, P. (1988) *Birds to watch: the ICBP world checklist of threatened birds*. Cambridge, UK: International Council for Bird Preservation and International Union for Conservation of Nature and Natural Resources.

Collar, N. J., Crosby, M. J. and Stattersfield, A. J. (1994)*Birds to watch 2: the world list of threatened birds*. Cambridge, UK: BirdLife International. (BirdLife Conservation Series 4).

Convention on Migratory Species (2005) CMS and the 2010 biodiversity targets. Eighth meeting of the Conference of the Parties, Nairobi, 20-25 November 2005, Agenda item 11. Available at http://www.cms.int/bodies/COP/cop8/documents/meeting_docs/en/Doc_06_2010_Biodiversity_Targets_Rev1.pdf (accessed 23 October 2008).

European Environment Agency (2007) Halting the loss of biodiversity by 2010: proposal for a first set of indicators to monitor progress in Europe. Copenhagen: European Environment Agency. Available at http://reports.eea.europa.eu/technical_report_2007_11/en/Tech_report_11_2007_SEBI.pdf (accessed 23 October 2008).

de Grammont, P. C. and Cuarón, A. D. (2006) An evaluation of threatened species categorization systems used on the American continent. *Conserv. Biol.* 20: 14–27.

IUCN (2001) *IUCN Red List categories and criteria: version 3.1*. Gland, Switzerland and Cambridge, U.K.: Species Survival Commission, IUCN.

IUCN (2008) Guidelines for using the IUCN Red List categories and criteria. Available from http://www.iucn.org/webfiles/doc/SSC/RedList/RedListGuidelines.pdf.

Millenium Ecosystem Assessment (2005) *Ecosystems and human well-being: wetlands and water synthesis*. Washington DC: World Resources Institute.

Pereira, H. M. and Cooper, H. D. (2006) Towards the global monitoring of biodiversity change. *Trends Ecol. Evol.* 21: 123–129.

Ramsar Convention (2008) Cooperation between the 2010 Biodiversity Indicators Partnership and the Ramsar Convention on Wetlands. Ramsar Conference of the Parties 10. Document 34. Available at http://www.ramsar.org/cop10/cop10_doc34_e.doc (accessed 23 October 2008).

Regan, T. J., Burgman, M. A., McCarthy, M. A., Master, L. L., Keith, D.A., Mace, G. M. and Andelman, S. J. (2005) The consistency of extinction risk classification protocols. *Conserv. Biol.* 19: 1,969–1,977.

Rodrigues, A. S. L., Pilgrim, J. D., Lamoreux, J. F., Hoffman, M. and Brooks, T. M. (2006) The value of the IUCN Red List for conservation. *Trends Ecol. Evol.* 21: 71–76.

Secretariat of the Convention on Biological Diversity (2005) Recommendations adopted by the Subsidiary Body on Scientific Technical and Technological Advice at its tenth meeting. Available from http://www.biodiv.org/recommendations/ (accessed September 2005).

Secretariat of the Convention of Biological Diversity (2006) *Global Biodiversity Outlook* 2. Montreal: Convention on Biological Diversity.

UNEP (2006) *Global Environment Outlook Year Book 2006*. Nairobi: United Nations Environment Programme.

United Nations (2008) The Millennium Development Goals report 2008. New York: United Nations.

Wetlands International (2008) *Agreement on the Conservation of African-Eurasian Migratory Waterbirds: report on the conservation status of migratory waterbirds in the agreement area*. Fourth Edition. Wageningen, Netherlands: Wetlands International.

Appendix: Methods

Calculating the RLI
The RLI is calculated from the number of species in each Red List category (Least Concern, Near Threatened, Vulnerable, Endangered, Critically Endangered), and the number changing categories between assessments as a result of genuine improvement or deterioration in status (category changes owing to improved knowledge or revised taxonomy are excluded). The original methodology was described in detail in Butchart *et al.* (2004, 2005), and revised in Butchart *et al.* (2007): the latter is used here. An RLI value is calculated as follows:

$$RLI_t = 1 - \frac{\sum_s W_{c(t,s)}}{W_{EX} \cdot N}$$

where *Wc(t,s)* is the weight of category *c* for species *s* at time *t*, which ranges from 1 for Near Threatened to 5 for Extinct (W_{EX}), and *N* is the number of assessed (non-data deficient) species. Put simply, the number of species in each Red List category is multiplied by the category weight, these products are summed, divided by the maximum possible product (the number of species multiplied by the maximum weight), and subtracted from one. This produces an index that ranges from 0 to 1 (see below).

These conditions are met by back-casting all non-genuine category changes to the year of first assessment (1988 for birds). In other words, we assume that species should have been classified at their current Red List category since 1988, apart from those species for which genuine category changes have occurred, in which case they are assigned to appropriate time periods, corresponding to the dates in which all species were reassessed (see Collar and Andrew 1988, Collar *et al.* 1994, BirdLife International 2000, BirdLife International 2004, BirdLife International 2008b). To determine these genuine cases, all category changes during 1988-2008 were assigned a 'reason for change', allowing genuine ones to be distinguished from those resulting from improved knowledge or taxonomic revisions (see Butchart *et al.* 2004, 2005, 2007 for further details).