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

Agreement on the Conservation of Albatrosses and Petrels

BirdLife International

Summary

The Red List Index (RLI) shows trends in aggregate extinction risk for sets of species based on data from the IUCN Red List. RLIs for ACAP-listed species, all seabirds and for all birds are summarised from 1988 to 2008, with the trend for ACAP-listed species projected to 2012 based on the 2012 IUCN Red List to be published later this year. 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 other seabirds (and likewise compared with all birds) and has deteriorated in status particularly rapidly over the last two decades. However the RLI for 2012 has not changed relative to recent assessments in 2004 and 2008. More comprehensive analyses of the recent population trends for ACAP-listed species will be completed by 2013 and may revise this picture further.

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 sixth meeting of the ACAP Advisory Committee (2011) BirdLife International was requested to provide the latest version of the relevant indicators to the fourth Meeting of Parties. 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, Conservation International and a number of other non-governmental organisations and academic institutions.

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 as one of the suite of indicators needed to track progress towards biodiversity targets (Brooks and Kennedy 2004, Millennium Ecosystem Assessment 2005, Pereira and Cooper 2006, Butchart *et al.* 2010, Secretariat of the CBD 2010, UNEP 2012). It is one of the suite of indicators recommended for assessing progress against the CBD 2020 targets (CBD 2011), and it is used to report on the indicator 'proportion of species threatened with extinction' under the United Nations Millennium Development Goal seven (United Nations 2010).

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).

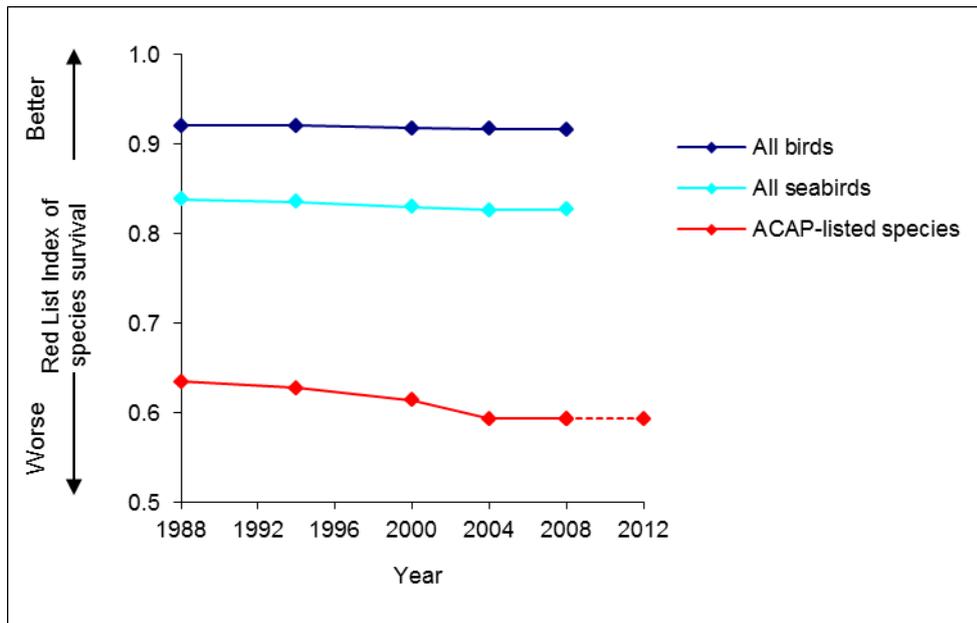**Red List Index for ACAP-listed species**

Figure 1. Red List Index of species survival for all bird species (n=9,853 non-Data Deficient species extant in 1988), all seabirds (n=339) and ACAP-listed species (n=29). Values for the last are projected to 2012 based on data from the 2012 IUCN Red List to be published later this year. 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 they are more threatened than birds overall (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, Croxall *et al*.2012).

The RLI for ACAP-listed species has been projected to 2012 based on data in the 2012 IUCN Red List for birds, which will be published by BirdLife International in May 2012, and by IUCN later in the year. This is illustrated with the dotted line in the figure above. Data are not yet complete to assess trends to 2012 for other species.

It is noteworthy that the RLI value for ACAP-listed species has remained level during 2004-2012. 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 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. A detailed analysis of population trends for ACAP-listed species is currently underway but was not completed in time for incorporation into the 2012 Red List. Its results

will be reflected in assessments for 2013, and this may lead to revision of the RLI trends presented here.

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 comprehensive population time-series datasets are available for a large majority of species listed under ACAP, derived from 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.

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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).