Using the IUCN Red List Criteria to Assess Species with Declining Populations

The World Conservation Union (IUCN) Red List categories and criteria provide an explicit, objective, quantitative framework for classifying the risk of global extinction for any species. The criteria provide quantitative thresholds for population size, trend, range size, and modeled probability of extinction. These are used to assign species to categories of extinction risk that can be compared between different taxa (World Conservation Union 2001). They have received international acceptance as decision tools in conservation biology because of their wide applicability, objectivity, and simplicity of use (Akçakaya et al. 2000).

Dunn (2002) applied the red list criteria to data from the North American Breeding Bird Survey (BBS; Sauer et al. 2001) and identified 41 Canadian breeding species that apparently qualified as threatened because of rapidly declining populations (she also applied these data to the British Trust for Ornithology "conservation alert levels," but these are not discussed here). Dunn then argued that "the majority of qualifying species were not candidates for immediate intervention to halt or reverse declines" and concluded that "unevaluated population decline should not be used as a sole criterion for identifying species of conservation interest or for determining what conservation action is most needed". Dunn was quite correct in these conclusions, but her argument and analysis leading to them are mistaken for three reasons.

First, Dunn argues that population decline alone is insufficient to determine whether species are at risk for extinction. However, even very abundant species have gone extinct following sharp reductions—the Passenger Pigeon (*Ectopistes migratorius*) for example (Bucher 1992)—and hence rapid decline is one symptom of endangerment. If this is the only information available, listing on this basis alone is therefore justifiably precautionary. The IUCN criteria A to D are designed to be precautionary because they are based on partial information and are often used in data-poor situations, where it might be easy to miss species that should be listed.

Second, Dunn states that population decline "should not be used as a sole criterion for . . . determining what conservation action is most needed." This is an oft-repeated error: red lists have always emphasized the distinction between identifying extinction risk and setting priorities for action (e.g., Mace & Lande 1991; Mace & Collar 2002). For example, the current guidelines (World Conservation Union 2001) explicitly state that "the category of threat simply provides an assessment of the extinction risk under current circumstances, whereas a system for assessing priorities for action will include numerous other factors . . . such as costs, logistics, chances of success, and other biological characteristics of the subject."

Third, Dunn applies the red list criteria to a raw data set without evaluating its quality and relevance for each species. She identifies 41 species that qualify as threatened, and then argues that most of these are not conservation priorities. However, the red list guidelines explicitly require detailed evaluation of all data used (Red List Standards and Petitions Subcommittee 2001). For example, the BBS only covers a small part of the range of a number of these species and therefore may not be representative of overall trends, including both those breeding further north, such as the Black-billed Cuckoo (*Coccyzus erythropthalmus*) and Blackpoll Warbler (*Dendroica striata*), and those breeding south into Central or South America, such as the Common Nighthawk (*Chordeiles minor*) and Evening Grosbeak (*Coccothraustes vespertinus*). Other species are well known to undergo significant population fluctuations in response to population cycles in spruce budworm, such as the Cape May Warbler (*Dendroica tigrina*; Morse 1989). Apparent declines over a short time period for such species may simply represent natural fluctuations, which are specifically excluded when declines are considered under the IUCN criteria (World Conservation Union 2001). For a number of species Dunn took trends for which $p > 0.05$. Trends that are marginally significant, nonsignificant and/or based on few sample points require critical examination before being used to assess extinction risk. In addition, Dunn used an older version of the criteria with a threshold for vulnerable status of 20% instead of 30% decline in 10 years (World Conservation Union 2001). Dunn also failed to consider generation times, which are likely to have been considerably longer than 3.3 years (the default she took) for some of the species considered (e.g., American White Pelican [*Pelecanus erythrorhynchos*]), although this will have made her assessments more conservative for any such long-lived species in genuine decline.

For these reasons—because data quality and the distribution and ecology of individual species *are* considered during red list assessment—only one of Dunn's 41 species (Sprague's Pipit [*Anthus spragueii*]) is actually included on the IUCN Red List at present (BirdLife International 2000; World Conservation Union

2002). Three others are listed on the Audubon Society Watchlist, which Dunn argues includes "all species that are highly at risk." However, these species are included on that list because they are identified as national priorities within the United States by the Partners in Flight scheme (Carter et al. 2000), not because they are global priorities. Globally, they are believed to be safe because of large, apparently stable populations outside of the BBS area: the Band-tailed Pigeon (*Columba fasciata*) occurs south to Argentina and Bolivia; the Black Swift (*Cypseloides niger*) occurs south to Costa Rica and throughout the Caribbean; and Baird's Sparrow (*Ammodramus bairdii*) remains abundant in Canada, where it has even increased in Saskatchewan because of habitat management (C. Hyslop in litt. 2000). Thus, Dunn's test of the utility of the red list criteria is invalid. Her application of the criteria to unevaluated trend data identifies a suite of species that are not included on the red list for the very reasons that she then cites as flaws of the system.

Since their introduction after a long phase of development (World Conservation Union 1994), the red list criteria have been improved and revised as a result of a continuing process of drafting, consultation, and validation, and lessons have been learned in using the criteria to identify over 18,000 animal and 34,000 plant species threatened with extinction (Walter & Gillet 1998; Hilton-Taylor 2000). Dunn correctly points out a particular example of a more general point: to adequately assess a species' extinction risk requires a detailed review of its population, trend, range, and ecology, and the data used for this should be assessed critically, with explicit consideration of sources of uncertainty (Akçakaya et al. 2000). The IUCN Red List categories and criteria provide the most useful objective framework for doing this at a global scale for a very broad range of taxa.

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Butchart appears to be responding to perceived criticism of the World Conservation Union (IUCN) Red List and its criteria. I hasten to assure him that criticism was not the intention of my paper, and that red-list criteria as they are used in practice give what I believe are consistent and valuable results. I specifically noted that the IUCN must, in fact, be considering criteria in addition to magnitude of population decline before listing species, because if they did not, the 41 species I listed in Table 2 would appear on their lists (instead of only one of those species).

Butchart argues correctly that some of the species in Table 2 would be eliminated from IUCN lists through evaluation of trend quality, but this is not true for many others. Thus, the IUCN must be considering additional criteria, and I believe they are correct in doing so. My only criticism is that the criteria outlined in the website (www.iucn.org/themes/ssc/redlists/criteria.htm) and by the Red List Standards and Petitions Subcommittee (2001) do