

Ruling of the IUCN Red List Standards and Petitions Subcommittee on Petitions Against the 1996 Listings of Four Marine Turtle Species

18 October 2001

Introduction

The decisions by the Standards and Petitions Subcommittee (S&PS) of the IUCN-SSC Red List Committee on two petitions against the listings of four marine turtle species are given below. One petition was filed by Nicholas Mrosovsky against the listings of *Natator depressus* (Flatback Turtle), *Lepidochelys olivacea* (Olive Ridley), *Chelonia mydas* (Green Turtle) and *Eretmochelys imbricata* (Hawksbill Turtle). Another petition was filed by Grahame Webb against the listing of *Eretmochelys imbricata* (Hawksbill Turtle).

The justifications of the Marine Turtle Specialist Group (MTSG) were received on 21 March 2001, and the justifications of the petitioners were received on 26 July 2001. The S&PS investigated these justifications and deliberated on the issues raised in them before reaching a decision on each case. The S&PS's evaluations were based on the information that was available in 1995, when these listings were made, and on the 1994 criteria, on which these listings were based. Thus, the S&PS did not consider information that became available after 1995, and the changes to the IUCN criteria that took effect in 2001.

The S&PS noted that the justifications by the MTSG for these listings suffered from a lack of organization, and a lack of rigor in applying quantitative criteria to the available data. However, recognizing that this is the first use of the appeal process, and that the documentation requirements that were in effect in 1995 were much less comprehensive than the current ones, the members of the S&PS opted to devote their own time, as necessary to re-apply the criteria and re-analyze the data. In many instances, then, this decision rests on the basis of the S&PS's re-analysis of the data submitted by the MTSG as well as by the petitioners. However, the time and effort required in order to re-analyze the data was an inappropriate demand on the S&PS, and future petitioners should not expect similar treatment with regard to their petitions. In the future, both listings and petitions will be expected to follow new requirements for documentation, recommendations for incorporating uncertainty, and guidelines for using the criteria.¹

¹ For the new documentation requirements and the new recommendations for dealing with uncertainty, see *IUCN Red List Categories: Version 3.1*. For guidelines for using Criterion A, see *Guidelines for Assessing Taxa with Widely Distributed or Multiple Populations Against Criterion A* (developed by the Standards and Petitions Subcommittee, June 2001).

Applying Criterion A

All four species that are the subjects of these petitions were listed under Criterion A in 1996. Three were listed under Criterion A1 (past reduction), and the fourth under Criterion A2 (future reduction). There are two important aspects of the application of Criterion A to long-lived and widely distributed species such as marine turtles. These relate to the temporal and spatial scales of the reduction.

Temporal scale of reduction: The criterion is based on long-term reduction (e.g., during the last 3 generations for Criterion A1). Thus, recent increases or decreases must be evaluated in the context of long-term change. A species that has been stable or increasing during the last few years (or even the last 1-2 generations) may still be listed under criterion A1, if the overall, 3-generation reduction meets the numerical threshold (e.g., 50% for Endangered). This is more likely in the case of long-lived species because the generation time (which is used to scale biological phenomena in the criteria) is long in comparison to recent changes in human-mediated threat processes.

Spatial scale of reduction: The criterion is based on the reduction in the global population, and not on the reduction in any specific population. Thus, in applying the criteria at the global level, reductions and increases in specific populations must be averaged. In cases where the starting population sizes are different, it is not appropriate to apply a simple arithmetic average; instead, the estimates of long-term reduction from different populations should be weighted by the initial sizes of these populations. This is described in more detail in the Criterion A guidelines mentioned above. These guidelines are applicable to both 1994 and 2001 IUCN criteria.

An overview of the issues raised in the petitions

Disagreements of interpretation: Most of the points made by the current petitions against the listings of the four marine turtle species were based on differences in the interpretation of available information. This decision addresses these differences based on the 1994 criteria and the issues of temporal and spatial scales summarized above.

Disagreements involving data: A number of the points made by the petitions involved disagreements over the data on which the listing is based. Most of these related to recent changes in the populations, and others concerned rather small differences; thus they did not significantly affect the outcome.²

Qualitative disagreements: Finally, some points made by the petitions involved qualitative aspects of the justifications for listing (e.g., language used in the justifications regarding the risk faced by the species). While some qualitative factors are relevant to the application of the criteria, others are not. The S&PS considered and addressed only information that was relevant to the criteria. Its decisions were not made, in whole or in part, on the basis of any arguments relating to qualitative aspects that are not operational or relevant to the application of the 1994 criteria.

² In the future, it is recommended that such factual disputes be clarified (or reasons for disagreements clearly identified) by dialog between the petitioner and the specialist group or the Red List authority. To this end, all data used in a listing must be either referenced to a publication that is available in the public domain, or else be made available.

Taxon: *Natator depressus* Flatback Turtle
Petitioner: Nicholas Mrosovsky
RLA/SG: Marine Turtle Specialist Group (MTSG)
Red List: VU A2cde (1996)
Ruling: DD

The petitioner claimed that future reduction due to pollutants, pathogens, and introduced taxa (criterion A2e), due to reduction in area of occupancy (A2c), or due to exploitation by indigenous people (A2d) was not evident. The MTSG justification referred to reported losses due to introduced foxes, feral dogs and pigs, reports of green turtle fibropapillomatosis in flatbacks, evidence of threats to habitat quality, and reports of accidental mortality by prawn trawling and coastal gill nets.

Although it is clear that there are reasons why some declines may be expected in the future, there is no quantitative evidence to suggest 20% decline in the next 3 generations. There is always going to be substantial uncertainty in using criterion A2 (future reduction) with long-lived species. This difficulty is further compounded here by lack of any specific quantitative information.

Thus, the S&PS believes that the information provided does not justify the use of criterion A2. However, considering that (as the MTSG states) this is one of the most poorly understood marine turtle species, and that the qualitative information provided suggests declines are possible, future reduction of 20% or more cannot be ruled out. For this reason, the S&PS decided that the appropriate listing for this species is Data Deficient (DD).

The justification by the MTSG also indicated that the flatback turtle has one of the most restricted geographic ranges of any marine turtle species. However, it did not provide data on the extent of occurrence or area of occupancy, and the listing was based on future reduction (criterion A2) not on restricted range (criterion B). Thus, the S&PS encourages the MTSG to assess this species in the future under Criterion B as well as Criterion A.

Taxon: *Lepidochelys olivacea* Olive Ridley
Petitioner: Nicholas Mrosovsky
RLA/SG: Marine Turtle Specialist Group (MTSG)
Red List: EN A1abd (1996)
Ruling: EN A1bd

This petition challenges the listing on the basis of the petitioner's statement that there is evidence of large numbers of nesting turtles, and increasing numbers in some areas. The justification by the MTSG emphasizes that the listing was based on past reduction, not on current numbers, and states that some of the reported increases occurred after 1995, when the listing was made.

As discussed in the Introduction, there are two important aspects of the application of criterion A1 to long-lived and widely distributed species such as marine turtles. First, the criterion is based on reduction over the last 3 generations. Thus, recent increases or decreases must be evaluated in the context of long-term change. Second, the criterion is based on the reduction in the global population, not on any specific population. Thus, reductions and increases in different populations must be averaged.

Crude calculations based on the data provided by the MTSG indicate that the reduction since the late 1960's has been close to 50%. The time frame for this decline was about 1 generation. Although the uncertainties in the data prevent an exact calculation of the reduction, it is very likely that the 3-generation reduction has been more than 50%. The petitioner's figures largely agree with those of the MTSG, except for a few locations. Even considering the numbers used by the petitioner, the S&PS concluded that a 50% reduction is plausible. Given the uncertainty, and the plausibility of a 50% decline, the interpretation of the available information for listing depends on one's attitude to uncertainty and risk. IUCN guidelines recommend a precautionary attitude and encourage reasoned inference, in order to reduce the chance of Type II errors.

The petition against the Olive Ridley listing also suggested that nesting females is not an appropriate index of abundance (criterion A1b), because high densities in some beaches suggest that the population might have reached its carrying capacity in those areas.

Under the IUCN criteria, "reduction" is defined as a decline in the number of mature individuals. Hence, an "index of abundance appropriate for the taxon" is an observable quantity that correlates reasonably with the number of mature individuals. The general concern in the use of any index of abundance is the validity of the assumptions that are required for the index to accurately reflect the trend in the actual number of mature individuals. Use of "nesting females" to examine population change assumes that the proportion of mature individuals that breed each year, and the number of visits per female per year are reasonably constant (or at least vary randomly) among years. For Olive Ridelies, the MTSG states, "nesting in successive years is commonplace and may be the norm for the species" and "individuals nest 1-3 times/season". If this is true, then the assumption is reasonable. Thus, the S&PS

believes that in this case, “nesting females” is an appropriate index of mature individuals, regardless of whether carrying capacity has been reached. The alternative index (suggested by the petitioner) based on feeding ground estimates lacks a clear relationship to “mature individuals” and seems to be more prone to sampling errors.

However, the S&PS disagrees with the MTSG that a count of “nesting females” constitutes direct observation (criterion A1a). The difference between direct observation (a) and index of abundance (b), as well as the value of value of distinguishing between them, lies in the assumptions to be met to provide valid estimates of abundance. While “direct observation” requires only statistical assumptions (e.g., random sampling), indices of abundance require assumptions related to the biology of the species. As discussed above, use of “nesting females” does require such assumptions. Consequently, this measure cannot be considered as direct observation. For this reason, the final decision will list this species as “EN A1bd”, rather than “EN A1abd”.

Taxon: *Chelonia mydas* Green Turtle
Petitioner: Nicholas Mrosovsky
RLA/SG: Marine Turtle Specialist Group (MTSG)
Red List: EN A1abd (1996)
Ruling: EN A1bd

This petition challenges the listing on the basis of the petitioner's statement that there is evidence of large and increasing or stable populations.

The considerations on the application of criterion A1 to long-lived and widely distributed species, discussed in the Introduction, and under the Olive Ridley and the Hawksbill petitions, apply to this case as well. However, in this case, the evidence for the overall decline is less easy to infer from the information provided. Such evidence consists of declines rates that are "well in excess of 50%", "much greater than 50%", in specific populations. Neither the MTSG nor the petitioner provides either decline rate estimates or population size estimates for all populations.

An optimistic estimate of global decline would assume the Australian population to be constant over the last 3 generations (although comments attributed to Limpus suggest there has been some reduction). Even so, given the apparent magnitude of reductions cited for other populations (more than 80% in Pacific Mexico, a fraction of former size in Indonesia, 80% or more in Mediterranean, in excess of 90% egg harvest in south-east Asia), the size of the Australian population would have to be much bigger than the historical sizes of the other populations to offset them and justify the conclusion that the overall reduction was below the 50% threshold. There is reasonable evidence to indicate that even the Australian population may be declining. Based on these, the S&PS concludes that the range of plausible estimates for the overall reduction, although very uncertain, is likely to include 50%. As noted above, in the face of this type of uncertainty, the specialist group is justified in taking a precautionary attitude. Therefore the S&PS finds the EN listing to be appropriate.

The generation length of this species is estimated by the MTSG as a minimum of 45 years, perhaps longer than 60 years. The S&PS believes the approach used to justify the generation length is consistent with that used for other marine turtle assessments – in any case, the conclusions of the assessment would be robust to a modification of the generation length. This is because the best-documented reductions have occurred in a much shorter time than 3 generations. Hence the outcome of the assessment would be insensitive to a substantial variation in estimates of generation length.³

As discussed above, with regard to the Olive Ridley petition, the S&PS has concluded that the number of nesting females cannot be considered as direct observation; thus, it has decided to change the listing to EN A1bd.

³ It is recommended that in the future justifications also consider how the threatening processes have changed over the last three generations.

Taxon: *Eretmochelys imbricata* Hawksbill Turtle
Petitioner: Grahame Webb and Nicholas Mrosovsky
RLA/SG: Marine Turtle Specialist Group (MTSG)
Red List: CR A1abd+2bcd (1996)
Ruling: CR A1bd

The two petitions opposing the listing of the Hawksbill Turtle raise similar issues, hence they are considered jointly.

Both petitions challenge the interpretation of the data and the conclusion that there has been an 80% reduction of the global population in the last 3 generations. For species with multiple populations, a listing under A1 needs to weigh the estimated reduction in each population with the relative size of that population 3 generations ago (see Introduction).

The specific disagreements are as follows:

Generation length:

One of the petitions challenges the generation length (35 years) used by the MTSG on the grounds that it ignores areas where the species grows faster (and reaches maturity earlier) and on the grounds that it uses a high estimate for the reproductive lifespan. In general, the S&PS supports the idea of calculating a weighted average of generation length for species that have populations with different generations lengths.⁴ In this particular case, even if the generation length were “closer to 25 years” (as the petition states), this would not significantly affect the assessment, because most of the recorded reduction has occurred in the last 20-40 years.

Past reduction:

According to the data presented in the MTSG justification (Meylan & Donnolly 1999; *Chelonian Conserv. and Biol.* 3:200-224.), there have been large declines in many populations distributed throughout the range. There seems to be no evidence to suggest that the recent declines (last 20-40 years) were preceded by a population increase, so the S&PS regards the declines over the last 20-40 years as a lower bound for the estimated reduction over the last 3 generations.

The petitions mention large and/or stable populations, but this is not inconsistent with long-term reduction. Even if the global population is stable or increasing, there may still be an overall decline of over 80% when a period of three generations is considered. The petitioners present evidence and arguments against current or recent declines (last 5-10 years). However, no data are presented that show increase or

⁴ In calculating a weighted average of generation length, it is important to consider the possibility that some of these differences may be due to increased mortality in the recent past due to exploitation by humans. If the generation length varies under threat, the new (2001) IUCN criteria require that the more natural, i.e. pre-disturbance, generation length be used.

stability of a major population in the last 3 generations, whether 75 or 105 years. Thus, although current trends provide important information, they need to be considered in the context of the 3-generation time period for the purposes of Criterion A.

Even if evidence of increase or stability of a major population in the last 3 generations were available, this would not preclude that the global population had declined by 80%. This is because the populations that declined the most (e.g., Indonesia) had made up a much larger proportion of the global population 3 generations ago. The estimates of reduction in different populations should be weighed with the initial abundances (3 generations ago), rather than current abundances. Thus, currently small populations (that have declined a lot) may contribute more to the estimate of global reduction than currently large populations that have remained stable.

Given the uncertainty about the past population sizes, the interpretation of the available information depends on one's attitude to uncertainty and risk. IUCN guidelines recommend a precautionary attitude and encourage reasoned inference, in order to reduce the chance of Type II errors.

The petitions also object to the A1d listing on the grounds that international trade has declined dramatically. However, A1d is based on past, long-term reduction. Therefore, what happened in the last few years is not of direct relevance to the use of A1d. Given the current population sizes and the historical levels of exploitation, a decline of 80% can be inferred.

The S&PS agrees with the petitioners that the MTSG's justification does not use the data effectively (i.e., it does not weight the trends in different areas). However, the data presented in the justification allows an informed interpretation. As provided in the MTSG's justification, the information on the various populations is difficult to "unify," as the decline rates are given in a variety of units (catch rates, landings, sightings rates per unit effort, etc). However, based on a rough estimate of the global population size, the size of the pre-1993 catches, and the observed declines in the areas of major population abundance, the S&PS concludes that it is appropriate to infer a reduction of 80% in the last 3 generations.

The petitions also point out that the justification quotes a recommendation to 'apply the status of the most imperiled population to the entire species.' This recommendation by Bjorndal (1999; *Chelonian Conserv. and Biol.* 3:174-76) is definitely a misinterpretation of the criteria, which require that reductions be considered across the entire range of the species. The most appropriate way of doing this is to calculate an average reduction across all populations weighted by their respective population sizes 3 generations ago. However, it does not appear that the assessment actually relies upon this misinterpretation. Although the assessors fail to estimate an overall estimate of reduction, they do present convincing evidence of reductions in excess of 80% over the last 3 generations "at many, if not most of the important breeding sites throughout its global range..." The S&PS concludes that the CR A1 assessment for Hawksbills would stand irrespective of Bjorndal's recommendation.

On the other hand, it is also inappropriate to base a global assessment only on the best-studied (or, monitored) populations (as one petitioner suggests), especially if

these constitute a small fraction of the global population. Although such populations often provide valuable data, restricting a global assessment to these populations might result in a biased estimate, because countries with the least resources for monitoring may also have the least resources for enforcement, the greatest exploitation, and hence the greatest rates of decline. In such cases, it may be unwise to ignore qualitative information about declines from other regions.

Another basis of the petitions' challenge is the statement in the MTSG's justification that "the species is not expected to become extinct in the foreseeable future". The S&PS concludes that the petitioner's criticism on this point is not valid, because the listing is based on quantitative criteria rather than the qualitative beliefs of the RLA.

The petitions also argue that nesting females is not an appropriate index of abundance. For the reasons discussed under the Olive Ridley petition, the S&PS disagrees with this argument, but also considers "nesting females" only an index of abundance, not direct observation, and has therefore decided to change the listing under A1 to A1bd.

Future reduction:

The petitions also challenge the listing under A2 (future reduction), on the basis of reduced trade, increased conservation efforts, and some increasing or stable populations.

On the one hand, the current trends in trade bans and protected areas suggest a slowing in the rate of population decline. On the other hand, however, increases in the ease of access, availability of technology and size of the human population in developing countries, coupled with the potential transience of international and national trade agreements are also valid factors for consideration in determining the future reduction in the global population of the species. In addition, the depleting stockpile and retained industry infrastructure in Japan, and the dialogue from Cuba are significant points raised by the assessors.

In re-examining all of this relevant information, the S&PS concludes that a future reduction of 80% (in the next 3 generations) does not seem to be well justified. Clearly, it is difficult to make an A2 assessment in the face of such a long generation time, and such unpredictable trends with regard to the threats to the species. The S&PS believes, however, that an estimate of 80% reduction requires more justification, in the form of recent trends in both population numbers and the nature and magnitude of threats. Based on the evidence presented in the justification, the S&PS believes that there is not sufficient basis for a CR A2 listing and removes the listing criterion CR A2bcd. Although the species may qualify for listing under A2 at threat levels lower than CR, this would not change the current listing, because the species qualifies for CR under A1.