



A framework for prioritizing cetacean subpopulations and subspecies for Red List assessment

Objective: Agree a transparent prioritization process to facilitate the selection of cetacean subpopulations and subspecies for assessment to promote conservation planning and action.

Problem: The IUCN Red List Guidelines define subpopulations as follows (a species is referred to in the Guidelines as a ‘population’):

Subpopulations are defined as geographically or otherwise distinct groups in the Population [species] between which there is little demographic or genetic exchange (typically one successful migrant individual or gamete per year or less).

Using this definition there are likely many hundreds or even thousands of subpopulations of cetaceans. In addition, there are unassessed subspecies recognized by the Society for Marine Mammalogy’s taxonomy committee (the recognized taxonomic source used for CSG assessments). It would not be feasible, or useful for conservation, to assess all subpopulations and subspecies. To further support the effort of prioritizing subspecies and subpopulations, hereafter referred to as ‘units’¹, that most urgently need assessment, we add selection criteria related to the biological and ecological importance of the unit to the taxon.

The focus on selecting the units in most need of assessment is consistent with the Species Survival Commission (SSC) actively encouraging Specialist Groups to devote smaller proportions of their time doing Red List assessments and larger proportions of their time Planning and Acting. However, most assessments are for cetacean species. Most cetacean species have very large distributions with numerous subpopulations that are demographically independent, and hence, could face different levels of threat that would result in different listing categories. These large distributions also often span large numbers of countries with many stakeholders, which makes conservation planning difficult if not impossible. As a result, the most effective ‘planning’ and ‘acting’ for most cetaceans will be at the subpopulation level.

Solution: The solution is to develop a transparent process to select units for assessment that would benefit the species by promoting conservation actions. We envision an annual meeting of the CSG Red List Authority to evaluate petitions to assess subpopulations. This process would allow the CSG to develop subpopulation assessments strategically and to ensure that they are suitably updated to support the Planning and Acting phases. In committing itself to Assessing selected subpopulations, the CSG is not necessarily committing itself to doing all the Planning and Acting for them – many skilled groups, local, regional and international, are in position to do most of that. The Red List assessments should aid those groups and, in addition,

¹ We use the term ‘unit’ to refer to groups of animals where the degree of differentiation and separation from other groups is unknown. Thus, units can include demographically independent populations, evolutionarily significant units and even subspecies and species that have yet to be recognized as such. A demographically independent population is one where internal dynamics (births and deaths) are far more important to persistence than external dynamics (immigration and emigration).



the CSG can provide facilitators who have been trained in the use of the Conservation Planning Specialist Group's tools and are able to convey lessons learned from experience with a variety of cetacean conservation activities.

Proposal: Generally, units deemed worthy of assessment should:

- 1) meet the subpopulation definition or be a recognized subspecies,
- 2) meet significance conditions that indicate the biological and ecological importance of the unit to the taxon, and
- 3) warrant listing in a threatened category (CR, EN or VU).

In addition, drafters of petitions to assess a subpopulation should describe the potential that the threatened listing may spur conservation actions that improve the subpopulation's conservation status.

We go into each condition to prioritize unit petitions in more detail below and suggest a point system to facilitate the prioritization process.

1. *Subpopulation definition:* The description of a subpopulation should make a convincing argument that the unit is demographically independent of neighboring units. Evidence that a cetacean unit meets IUCN's definition of a subpopulation can consist of data on morphology, distribution, behavior or genetics. A distributional hiatus combined with evidence for relatively limited movements across the hiatus is sufficient to meet the subpopulation definition. An example is units found in different ocean basins or seas without any suitable habitat² connecting the unit to the nearest other unit. Behavioral evidence may include things like a finding that units migrate to different wintering areas (often on different sides of ocean basins or continents) or have unique prey specializations. Lack of photographic or genetic matches between well sampled units can also support demographic independence. Significant genetic differentiation is often sufficient evidence to meet the subpopulation definition, which allows for fairly high levels of gene flow (1 migrant per year).
2. *Significance to the species:* Here *significance* means the biological and ecological importance to the taxon to which the unit belongs (either a species or a subspecies). In other words, a significant unit is important to the evolutionary legacy of the species as a whole and if lost would likely not be replaced through natural dispersion. Prioritizing points are shown in parentheses following each significance condition and additional explanation of the conditions is given in footnotes. A subpopulation is considered significant to the species if it meets any of the following conditions: 1) persists in an ecological setting that is unusual or unique to the taxon³ (1 point), 2) loss of the unit would result in a significant gap⁴ in the

² Habitat constraints should be described and for cetaceans are often water depth or temperature.

³ Where 'unique or unusual ecological setting' refers to habitats with distinctive ecological features that would likely result in the unit's developing adaptations to its environment.

⁴ 'Gap' refers to any portion of the species' range and does not need to be in the middle of the range. 'Significant gap in the range' implies that the loss of the subpopulation from this area would result in the loss of resilience (ability to sustain itself while facing demographic and environmental stochasticity), redundancy (ability to



range of the species (1 point), 3) genetic characteristics are inferred to enhance the evolutionary resilience of the species⁵ (1 point), or 4) other factors important to the resilience of the species⁶ (1 point). The subpopulation must meet at least one of these conditions to merit assessment and can receive a maximum of 2 points for meeting multiple conditions.

3. *IUCN Red List Category*: A preliminary appraisal of the IUCN Red List category to which the unit is likely to be assigned can be useful both for determining whether the unit is in need of conservation Planning and Acting and/or for evaluating the urgency of that need. While these preliminary appraisals will need to be refined, eliminating Least Concern units should be relatively straightforward. Units likely to merit a CR listing should have priority for assessment over those likely to be assessed as VU. Point for threat categories are: CR (4 points), EN (2 points), VU (1 point).

Petitioners should also provide information on whether the subpopulation is already effectively protected. The objective of doing subpopulation assessments is to provide listings that may guide and promote active conservation efforts. If the subpopulation is already the object of conservation actions/protections through, for example, domestic legislation or international agreements, the Red List assessment could be superfluous and therefore not warranted. However, in some cases domestic legislation or international agreements fail to actually protect the unit, and in such cases the Red List assessment may be useful to spur actual conservation. The efficacy of such legislation or agreements could be evaluated using local expert opinion, taking care to cover key range states.

Because subpopulations are intentionally being selected as the cases in most urgent need of management actions, they must not be used in simplistic and inevitably misleading calculations that purport to characterize the overall state of risk to cetacean subpopulations.

withstand unforeseen catastrophes), and/or representation (ability to adapt over time to long-term changes in the environment) of the taxon as a whole, and where the importance of the range to the taxon considers its historical and future range.

⁵ Where 'evolutionary resilience' is understood to mean that the unit is inferred to contain components of genetic diversity that are associated with adaptation to its environment and that are unlikely to be present in high frequencies in other subpopulations. Direct evidence for adaptation to their environment is rare for cetaceans, but genetic evidence that the segment has been isolated from the rest of its taxon for a lengthy period of time can be used to infer localized adaptation. One example of such indirect evidence could be a large magnitude of differentiation in both mitochondrial and nuclear genetic markers. Statistically significant differences between groups alone are not necessarily sufficient evidence of genetic differences that would confer evolutionary resilience to the taxon. An example would be the island-associated false killer whales in Hawaii that have an mtDNA haplotype not found elsewhere and differ in nuclear DNA from neighboring pelagic false killer whales.

⁶ Other factors that could be important to the taxon include behavioral or cultural diversity, where culture refers to knowledge passed through learning from one generation to the next. For instance, learned migratory behavior could be considered under this condition.



The point-based system is aimed at ensuring that CR units with significance to the species are assigned the highest priority assuming that their conservation status would be improved as a result of the assessment. The rationale for the point system is that the CR subpopulations are in most urgent need of assessment even if they meet only a single significance condition (i.e. adding one point for an EN subpopulation for meeting multiple significance conditions does not raise its rank to that of a CR subpopulation). In contrast, a VU subpopulation that meets multiple significance conditions (and hence would get 2 total points) would end up with the same rank as an EN subpopulation that met only a single significance condition (2 total points, with 2 for EN and none for the significance condition).