



GUIDELINES FOR TERMS AND CONCEPTS USED IN THE SPECIES AT RISK PROGRAM



Figure 1: Department of Fisheries and Oceans' (DFO) six administrative regions.

Context :

When the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) assesses an aquatic species and recommends a status of Threatened or Endangered, DFO undertakes a number of actions required under the Species at Risk Act (SARA). Science information is required to support development of scenarios for evaluating the social and economic costs of recovery, to inform public consultations, and serve other jurisdictional functions regarding the decision to list a species on Schedule 1 of SARA.

A workshop was held in August 2007 to develop new guidelines for Recovery Potential Assessments (SAR 2007/039) and to provide advice on identifying and quantifying Critical Habitat (SAR 2007/038). During discussions at the workshop, many participants identified the need for clearer guidance on how to interpret and describe a number of terms and concepts that are discussed and identified in Recovery Potential Assessments (RPAs), recovery strategies, action plans and other SARA related documents. Additional guidance is needed for the Department (and Science Sector) to interpret these terms in a consistent way from Region to Region and from stock to stock. For many of these terms there are Policy, Habitat and Science aspects to their interpretation and these boundaries need to be clarified further. To address these concerns, a workshop was held in 2008 to provide guidance in interpreting a number of terms used within the SARA.

The contents of this SAR represent the best scientific and technical advice that can be provided on the interpretation of terms in the Species at Risk Act according their ecological and biological meanings. However, being found in the Species-At-Risk Act, the terms discussed in this Advisory Report are subject to interpretation by the judicial system. In considering the advice herein, practitioners should ensure that they are familiar with any subsequent (to June 2008) judicial statements that would bear on the application of the term.

SUMMARY

- Guidance on best practices for interpreting a number of terms within the SARA context is provided. These terms include: harm / harass; damage / destroy / destruction; residence; prey and hosts as a feature of Critical Habitat; acoustic environment as a feature of Critical Habitat; feasibility of recovery; threats to species at risk and their habitat; and recovery targets.

INTRODUCTION

One of the outcomes of the August 2007 workshop on Critical Habitat and Recovery Potential Assessment was the need for clearer guidance on how to interpret a number of different terms and concepts used in RPAs and SARA legislation. A workshop was held in June, 2008 to develop guidelines for the interpretation of specific concepts and terms used in the SARA program so that Sectors and Regions could implement these terms in a consistent manner.

The problems interpreting a number of terms and concepts used in the SARA program were reviewed and guidance on best practices for interpreting these terms in a SARA context was developed at a workshop in 2008. The terms and concepts under review were:

- harm / harass;
- damage / destroy / destruction;
- residence;
- prey and hosts (as a feature of Critical Habitat);
- acoustic environment (as a feature of Critical Habitat);
- feasibility of recovery;
- threats to species at risk; and
- recovery targets.

The proceedings of the workshop are posted on the Canadian Science Advisory Secretariat (CSAS) website (Proceedings Series 2009/043).

For each term under discussion, SARA experts were invited to prepare working papers that provided background information on the issue, the problem interpreting this term in the SARA context, factors to be considered in interpreting the term and possible solutions on how to interpret the term. The papers are posted in the CSAS Research Document Series.

ANALYSIS

Harm

The adverse result of an activity where a single or multiple events reduce the likelihood of survival or recovery of the species/population by impacting the fitness (survival, reproduction, growth, movement) of individuals.

Harass

An activity, associated with an individual or a population, which by means of its frequency and magnitude could reduce the likelihood of recovery or survival of the species by changing its behaviour and thus impacting a life history function.

It is sufficient to observe a direct change in behaviour in association with the activity, if a plausible case can be made that the change in behaviour may impact a life history function which could reduce the likelihood of recovery or survival of the species.

If direct behavioural change is not apparent, it would be necessary to reference scientific literature to support a line of plausible reasoning that the activity impacts a life history function. The supporting documents do not have to be for the same species under consideration.

Damage to residence

Any change to the species residence, temporarily or long term, that reduces its suitability to be occupied, or habitually occupied, by one or more individuals during all or part of their life. A “reduced suitability to be occupied” can be interpreted to include reduced capacity for the species to complete the life history function(s) directly associated with the residence, even if the residence can be physically “occupied” after the change.

Destruction of Critical Habitat

A more than temporary change to the physical, biological or chemical properties of any part of a species’ Critical Habitat that renders the habitat unsuitable for fulfilling one or more of the life history function(s) necessary for the survival or recovery of the species.

More than temporary should be interpreted relative to the life history of the population of concern. A change in Critical Habitat features that can reasonably be expected to be reversed within the lifespan of individuals currently part of the adult population is not a more than temporary change and would not jeopardize the survival or recovery of the species.

Destroy and Destruction should be interpreted relative to the impact on parts of the total designated Critical Habitat of a population, even if alternative habitat might exist.

Destruction to the residence

A more than temporary change to the dwelling place that eliminates the residence of one or more individuals, the use of the residence, or the suitability of the residence so that the life history function(s) associated with the residence and necessary for the survival or recovery of the species are not fulfilled.

A more than temporary change should be interpreted relative to the life history of the individual of concern. A change that can reasonably be expected to be reversed within the breeding cycle of the individuals using the residence would not constitute destruction.

Residence

SARA defines “residence” as a dwelling-place, such as a den, nest or other similar area or place, that is occupied or habitually occupied by one or more individuals during all or part of their life cycles, including breeding, rearing staging, wintering, feeding or hibernating.

Environment Canada (EC) guidelines (EC 2004) on defining residence include three criteria: 1. do individuals of the species use a specific, discrete dwelling place that is similar to a den or nest, 2. are these places occupied or habitually occupied by the individual(s), and 3. are these places crucially linked to the performance of a specific function, so if that location is not available, or has been impaired, the function will not be carried out successfully at that time. Based on these criteria, agreement was reached that hosts and spawning shoals are not residences (i.e., did not meet criterion #1) but redds and nests are residences (i.e., met all criteria). Although hosts are not a residence, the availability of a host and/or the threats to the host need to be managed.

To further describe residences for aquatic species, the following guidance is provided.

- Individuals (not a population) should make an investment (e.g., energy, time, defense) in the residence and/or invest in the protection of the place and structures that are the residence (and not just protecting the individual, its mate and/or its young).
- The location and features of the residence contribute to the success of the life history function (e.g., breeding, rearing stage, wintering, feeding, or hibernating) of the individual.
- For some species, the residence may be a central location within the individual’s larger home range, with repeated returns by the species to complete a specific life function.
- There should be some aspect of uniqueness associated with the residence, such that if the residence were “damaged” the individuals would usually not be able to immediately move the completion of the life history function(s) to another place without resulting in a loss in fitness.

Prey as Critical Habitat

The current position of DFO is that Critical Habitat is identified by geo-physical features that are limited to geo-spatial areas. This position has prompted the need for guidance on how to treat habitat features (e.g., food supply, sound) that are not physical properties of the environment.

Prey need not be defined as habitat to be included in the identification of Critical Habitat. Any description of Critical Habitat should include the features of that habitat that make it critical to the survival or recovery of the species. While this would not provide the protection to a prey species that defining them as Critical Habitat would provide, it is consistent with the legislated definitions of habitat and the body of scientific knowledge and theory about the behaviour and ecology of animals. It will require, however, that prey species be managed to maintain the features of Critical Habitat needed for the recovery and survival of species at risk.

Additional guidance is provided by the following.

- Critical Habitat must be defined as a geo-spatial area, but prey or other resources can be defined as a feature of Critical Habitat, with a biological rationale.

- For a particular prey to be considered as a feature of Critical Habitat, the prey has to be important to the fitness of the predator (i.e., the species at risk cannot readily compensate for the lack of prey by using an alternative food source, and there would be a noteworthy impact on the fitness of the species at risk).
- When prey are sedentary, measurable, and spatially identifiable, their presence and/or relative abundance can be considered a feature used in delineating Critical Habitat (e.g., occurrence of a specific aquatic plant or sessile benthic organism that is an important food source for the species at risk). It is not necessary to delineate Critical Habitat using the geo-chemical features of the land and water that make the area suitable for the sedentary prey.
- If prey are normally closely associated with specific abiotic or biotic features that are sedentary, those features can be considered in delineating Critical Habitat (e.g., the aquatic vegetation known to be a reliable indicator of presence of an aquatic insect that is important prey for a species can be a feature of Critical Habitat).
- The features that are associated with high aggregation of the prey may sometimes be mobile themselves (e.g., eddies or gyres in the sea or sand bars in a stream). In such cases, the delineation of Critical Habitat requires two steps.
 - The first step would be specifying the geo-referenced coordinates of a larger area within which these specific features would be likely to occur
 - The second step would be to specify the exact features within the larger area that are associated with the high concentration of prey. These features would be the Critical Habitat protected from destruction.
 - This approach might be used for features of Critical Habitat associated with life history functions other than feeding.
- Federal legislation, such as the *Fisheries Act*, provides diverse mechanisms to directly manage threats to prey and their habitats. Hence, it is not necessary for prey or areas important for prey to be defined as Critical Habitat, in order to be managed for the survival or recovery of the species at risk.
- Hosts are not Critical Habitat, they are an attribute of Critical Habitat.

Acoustic environment as an attribute of Critical Habitat

Marine mammals use the acoustic properties of water to assist in the passive reception of ambient sounds and in the transmission of produced sounds. The acoustical properties of a particular habitat can enhance or reduce its suitability or quality. The effects of anthropogenic noise on marine mammals include: short or long-term physiological effects; disruptive behavioural responses or auditory masking of individual's own signals or those of conspecifics; or of natural ambient sounds. The potential results of these effects are: reduced social contact and sensory integration within and between groups; changes to normal behaviours displacement from ensonified areas; reduced foraging efficiency; or increased rates of predation.

- For marine mammals, degradation of the acoustic environment often can have detrimental consequences for the fitness of individuals and populations, and may reduce the likelihood of the survival or recovery of the species.

- Changes to the acoustic environment of marine mammals may constitute a threat that must be managed to mitigate potential negative impacts to survival or recovery. Building on precedents for managing chemical threats (e.g. heavy metal pollutants) to populations, species and habitat, the following approach was considered appropriate for managing acoustic threats:
 - If the marine mammal shows direct behavioural responses to the anthropogenic sound, it will usually be most efficient to manage the source of sound as a threat. Even a short-term acoustic event should be evaluated relative to constituting Harm or Harassment of individuals.
 - If the anthropogenic sound reduces the quality of an area as a place to pursue specific life history functions, then it should be considered a habitat issue. It should be evaluated relative to the previous standards for Destruction of Critical Habitat; that is, relative to the survival or recovery of the species, taking into consideration the life history of the species and the likelihood that the anthropogenic sound would persist unless there is management intervention.
- The same logic and principles would apply for fishes, or any aquatic species, relative to anthropogenic activities that directly affect important sensory mechanisms (chemical, olfactory, gustatory).

Feasibility of recovery

Under SARA, the competent minister must determine whether the recovery of the listed wildlife species is technically and biologically feasible. Biological feasibility is defined as a function of the intrinsic ability of a population/species to achieve the status of a viable, self-sustaining population that persists in the wild for multiple generations without human intervention. Technical feasibility can be considered the ability of management to successfully implement any actions required to achieve species recovery, regardless of cost. The feasibility of recovery should, therefore, be based on the best available biological and technical information, and not socio-economic information.

Recovery is considered technically and biologically feasible if all of the following four criteria are met:

- individuals of the wildlife species that are capable of reproduction are available now, or in the foreseeable future, to sustain the population or improve its abundance;
- sufficient suitable habitat is available to support the recovery of the species or could be made available through habitat management or restoration;
- primary threats to the species or its habitat (including threats outside Canada) can be avoided or mitigated; and
- recovery techniques exist or can be developed to achieve recovery goal.

In general, there are three requirements for biological feasibility of recovery:

- correction or removal of the root cause(s) of decline;
- sufficient habitat to support a viable population; and
- sufficient number of breeding individuals to overcome the initial elevated extinction risk.

Technical feasibility is dependent upon the ability of the organizations and jurisdictions responsible for recovery to respond to the needs of a species such that its recovery can be achieved. Questions to be considered to determine if it is technically possible to provide the conditions required for a recovery include:

- can the root cause(s) of decline be determined and eliminated;

- can habitat loss be reversed, if it cannot be linked to a single cause which can be mitigated this may not be possible (e.g., global warming);
- have biotic changes occurred which cannot be reversed or which we are unlikely to reverse; and
- has an alternate stable population level been established which the population is unlikely to move beyond.

In addition to the above, the following guidance is also provided.

- If biological feasibility is assessed and it is concluded that recovery is not biological feasible, then it is not necessary to assess technical feasibility.
- In assessing biological feasibility, if causes of mortality or reduced productivity are unknown, some rationale must be provided to justify the assessment of feasibility.
- In assessing technical feasibility of recovery, cost to implement technically feasible measures is not a legitimate consideration. It does become relevant at later stages in the recovery planning process.
- In assessing technical feasibility, rationales must be provided if it is assumed that technologies can be developed to address threats for which mitigation technologies have not been proven.

Threats to species at risk and their habitats

Threat, as defined in the Environment Canada (2007) *Draft Guidelines on Identifying and Mitigating Threats to Species at Risk* is any activity or process (both natural and anthropogenic) that has caused, is causing, or may cause harm, death, or behavioural changes to a species at risk or the destruction, degradation, and/or impairment of its habitat to the extent that population-level effects occur. The threats impacting a species at risk must be identified at several points in the SARA listing process: pre-COSEWIC assessment; COSEWIC assessment; recovery potential analysis; regulatory impact assessment statement; and, recovery strategies and action plans. SARA places the initial responsibility of identifying threats on COSEWIC. The responsibility of the further identification of threats rests with the Minister through the implementation of recovery strategies, action plans and management plans. Because SARA is specific about threats of serious or irreversible damage to listed species, it is important to determine the magnitude (severity), extent (spatial), frequency (temporal) and causal certainty of each threat. For clarity and maximum utility, the distinction should be made between general threats (e.g. agriculture) and specific threats (e.g. siltation from tile drains). The causal certainty of each threat must be assessed and explicitly stated; threats may be identified based on hypothesis testing (lab or field), observation, expert opinion or speculation.

The assessment of threats would be improved if:

- standardized terminology was used;
- the assessment included the magnitude and impact of the threat;
- vague descriptions (e.g. agriculture, urbanization) were replaced with more specific wording (e.g., erosion from farming practices causing siltation and eutrophication).
- threats of serious or irreversible damage to listed species were identified and distinguished from chronic, background or landscape threats;

- threats are distinguished between those that can and cannot be addressed through SARA or recovery strategies and actions plans;
- cumulative threats are addressed; and
- threats are linked to the DFO Fish Habitat Management's Standard Operating Procedures (linking habitat-related threats to the Pathways of Effects).

Recovery targets: the Central & Arctic Region experience

After reviewing several population-based approaches to setting recovery targets, it was determined that demographic sustainability using PVA was the best approach. Demographic sustainability does meet the SARA requirements, can be estimated for data poor species, and is consistent with the 2005 DFO framework. Minimum viable population (MVP) size has been used often as the abundance target.

Due to the uncertainty associated with establishing recovery targets, further guidance could not be given. This guidance will have to be developed at a future workshop on recovery targets that would be held to update the current Framework for Developing Science Advice on Recovery Targets for Aquatic Species in the Context of the *Species At Risk Act* that was developed in 2005 (CSAS Science Advisory Report 2005/054).

CONCLUSION

Consensus was reached on the interpretation of a number of terms associated with the implementation of the *Species at Risk Act*. It must be recognized, however, that the interpretation of these terms is subject to the judicial system and to the posting of subsequent policy documents.

SOURCES OF INFORMATION

EC. 2004. The Environment Canada Species at Risk Recovery Program Federal Policy Discussion Paper: Residence, April 2004

FOR MORE INFORMATION

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ISSN 1919-5079 (Print)
ISSN 1919-5087 (Online)
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La version française est disponible à l'adresse ci-dessus.



CORRECT CITATION FOR THIS PUBLICATION

DFO. 2010. Guidelines for Terms and Concepts Used in the Species at Risk Program. DFO
Can. Sci. Advis. Sec. Sci. Advis. Rep. 2009/065.