



Northwest Territories Species at Risk Committee (SARC)
SPECIES ASSESSMENT PROCESS

BACKGROUND FROM THE *SPECIES AT RISK (NWT) ACT*

The *Species at Risk (NWT) Act* (2009; hereinafter referred to as “the Act”) includes the following guidance with respect to species assessment:

28 (1) (b) SARC shall develop and periodically review with the Conference... objective biological criteria for assessing the status of a species and for categorizing a species¹;

31 (1) SARC shall assess the status of a species based on

- (a) the approved species status report;
- (b) the objective biological criteria referred to in paragraph 28(1)(b); and
- (c) any information on the biological status of the species provided to SARC in writing by the Conference or a Management Authority after the species status report is approved.

(2) In assessing the status of a species, SARC shall not consider any socio-economic effects or any possible consequences of the assessment if it is implemented.

(3) Within one year after approving a species status report, SARC shall

- (a) assess the status of the species;
- (b) provide the assessment to the Management Authorities; and
- (c) make the assessment available to the public under section 33.

32 In an assessment of the status of a species, SARC

- (a) shall categorize the assessed species as
 - (i) a data deficient species,
 - (ii) a species not at risk,
 - (iii) a species of special concern,
 - (iv) a threatened species,
 - (v) an endangered species,
 - (vi) an extirpated species, or
 - (vii) an extinct species;
- (b) shall include existing or potential threats to and positive influences on the species and its habitat identified by SARC in making the assessment; and
- (c) may include measures to conserve the species and its habitat.

¹ In this document, ‘species’ refers to a species, subspecies or distinct population to which the Act applies.

STEPS IN THE ASSESSMENT PROCESS

To assess a species, SARC will follow these seven steps in order:

1. Determine if the species is eligible for assessment and what groupings (species, subspecies or distinct populations) should be assessed (see section 1).
2. Approve the species status report (see section 2).
3. Confirm that the species is eligible for assessment and that the appropriate groupings (species, subspecies or distinct populations) have been chosen for assessment (see section 3).
4. Apply the objective biological criteria². What status is suggested? (See section 4).
5. Consider the significance of immigration from populations elsewhere. This information may be used to modify the initial assessment (see section 5).
6. Consider the significance of other biological characteristics. This information may be used to modify the initial assessment (see section 6).
7. Consider whether the suggested status matches with the definition for the status category (see section 7). If they don't match, the status with the best definition will take precedence and any disagreement between the definition and the criteria will be explained.

The final assessment should include the following:

- The status category;
- An explanation of which of the objective biological criteria were met;
- Additional details on the criteria; for example, if one of the criteria is a population decline, specify:
 - whether the evidence for population decline is based on direct observation of numbers, an appropriate index of abundance, range, or habitat quality;
 - the probable cause(s) of the decline (if known); and
 - the percent decline (if known).
- An explanation of how the assessment was modified based on immigration (if applicable);
- An explanation of how the assessment was modified based on biological characteristics (if applicable);
- An explanation of how the assessment was modified based on disagreement between the criteria and the definition (if applicable);
- A description of existing and potential threats to the species and its habitat;
- A description of existing and potential positive influences on the species and its habitat; and
- Recommended measures to conserve the species and its habitat (optional).

² Criteria, thresholds and guidelines were developed by SARC to suit Northwest Territories (NWT) circumstances and conditions, using those of the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) as a starting point (Source: COSEWIC (2009) *COSEWIC's Assessment Process and Criteria*; approved by COSEWIC in April 2009; from www.cosewic.gc.ca, downloaded March 10, 2010). Those in turn were based on those of the International Union for the Conservation of Nature and Natural Resources (IUCN). The IUCN criteria were derived from wide review and consultation with an aim to consistency across a range of species and places. They are a world accepted standard (Source: IUCN (2001) *IUCN Red List Categories and Criteria: Version 3.1*. IUCN Species Survival Commission. IUCN, Gland, Switzerland and Cambridge, U.K. Available at <http://www.redlist.org/>).

SECTION 1

STEP 1: DETERMINE IF THE SPECIES IS ELIGIBLE FOR ASSESSMENT AND WHAT GROUPINGS (SPECIES, SUBSPECIES OR DISTINCT POPULATIONS) SHOULD BE ASSESSED

Guidance from the *Species at Risk (NWT) Act*

Regarding eligibility for assessment, the *Species at Risk (NWT) Act* says the following (sections 8 and 144):

In order to be eligible for assessment by SARC, a species must not be:

- a bacterium, virus, or single-celled organism;
- a fish (as defined in section 2 of the *Fisheries Act* (Canada)); unless there is an agreement between the Minister of Environment and Natural Resources and the Government of Canada that SARC should assess it;
- a marine plant (as defined in section 47 of the *Fisheries Act* (Canada)); unless there is an agreement as described above; or
- a migratory bird (as defined in subsection 2(1) of the *Migratory Birds Convention Act, 1994* (Canada)); unless there is an agreement as described above.

In order to be eligible for assessment by SARC, a species must be:

- wild by nature; **and**
- indigenous to the Northwest Territories (NWT), or has extended its range into the NWT without human intervention (note: a species can be indigenous even if it is extirpated); **and**
- a species, subspecies or distinct population of animal, plant or other organism.

'Distinct population' means either

- a geographically or biologically distinct population of a species, **or**
- a distinct population, other than a geographically or biologically distinct population, identified by the Conference of Management Authorities for referral to SARC under section 26 of the Act.

The Conference of Management Authorities (CMA) has discretion to refer distinct populations for assessment even if they are not geographically or biologically distinct (section 26):

- The CMA may refer a species (or a subspecies, geographically or biologically distinct population, or other distinct population) to SARC for assessment.
- The CMA shall provide reasons for requesting the assessment and, if it is a distinct population other than a geographically or biologically distinct population, reasons why that distinct population should be assessed.

- SARC is required to assess a species, subspecies or distinct population referred in this way.

Further interpretation by SARC

Before beginning the status report, SARC should consider whether the species is wild by nature and indigenous to the NWT or has extended its range into the NWT without human intervention. SARC should also consider whether the assessment should be done for the species as a whole, or whether it should be done by subspecies or distinct populations. Considering this ahead of time allows SARC to give appropriate instructions to the person preparing the status report.

Sometimes conserving diversity requires protecting groups below the species level, such as subspecies and distinct populations. The *Species at Risk (NWT) Act* recognizes this and gives SARC a mandate to assess these smaller groups when warranted.

SARC may use the following guidelines to help identify subspecies and distinct populations that are appropriate for assessment. The guidelines should be seen as tools, not as hard and fast rules.

Recognizing subspecies:

SARC may assess a subspecies that is named and generally accepted. SARC may choose not to recognize a subspecies for assessment if the best available information does not support its validity.

Recognizing distinct populations:

A population may be considered 'distinct' based on one or more of the following aspects:

BIOLOGICALLY DISTINCT

Genetically distinct

There is evidence that this group is genetically different from others of its kind. The evidence could be molecular (e.g. different DNA features, different forms of an enzyme) or it could be shown as differences in inherited traits (e.g. different life history, behaviour, or body form).

Evolutionary divergence

There is evidence that this group is genetically different from others of its kind, and the difference is thought to reflect a different evolutionary development and history (i.e. their group split off from the rest a long time ago).

Local adaptations

The group lives in an environment that is unusual or unique. Local adaptations are either known to exist or are likely to evolve in the future. 'Local adaptation' is when a group evolves traits that help them to survive or reproduce in their specific environment.

GEOGRAPHICALLY DISTINCT

Naturally disjunct

Substantial portions of the species' range are separate and disconnected from each other. Movement of individuals between the separate areas has been severely limited for a long time and is not likely in the foreseeable future. Local adaptations are likely to evolve over time.

Ecological regions

Groups live in different ecological regions (e.g. ecozones; boreal forest versus Mackenzie mountains). The different regions are relevant to the species. Some movement may occur between regions, but not very much. Local adaptations are likely to evolve over time.

Conference of Management Authorities' discretion

The *Species at Risk (NWT) Act* gives the CMA discretion to refer distinct populations for assessment, even if they are not geographically or biologically distinct. The CMA must provide reasons.

In such cases, preparing a status report for the full species in the NWT will allow SARC to assess the population of interest in context, so that the significance of immigration from other populations can be considered appropriately (see section 5).

SECTION 2

STEP 2: APPROVE THE SPECIES STATUS REPORT

Guidance on preparing species status reports is provided in a separate document, the '*SARC Guidelines for Species Status Reports*'.

On being satisfied with a species status report, SARC will approve it. SARC will approve a species status report before assessing the status of that species.

Consider the following:

- Does the status report have adequate information to decide if the species is eligible for assessment?
- Is the status report adequate and acceptable for assessment purposes?

SECTION 3

STEP 3: CONFIRM THAT THE SPECIES IS ELIGIBLE FOR ASSESSMENT AND THAT THE APPROPRIATE GROUPINGS (SPECIES, SUBSPECIES OR DISTINCT POPULATIONS) HAVE BEEN CHOSEN FOR ASSESSMENT

Before beginning the status report, SARC determined that the species is wild by nature and indigenous to the NWT or has extended its range into the NWT without human intervention. SARC also used the guidelines in Section 1 to help determine whether the assessment should be done for the species as a whole, or whether it should be done by subspecies or distinct populations.

As the best available information is gathered into a status report, information may come to light that could change these determinations. Therefore, after the status report is complete SARC will revisit the questions of eligibility and grouping for assessment (using Section 1) to confirm that the correct decisions were made, before proceeding with the assessment.

SECTION 4

STEP 4: APPLY THE OBJECTIVE BIOLOGICAL CRITERIA. WHAT STATUS IS SUGGESTED?

SARC uses objective biological criteria to assess and categorize species. The criteria are tools, not hard and fast rules. They are a way for SARC to show its work and explain how it determined the status.

Although definitions for Extinct, Extirpated, Endangered, Threatened, Special Concern and Data Deficient appear in the Act, SARC developed the following interpretations for the implementation of their objective biological criteria.

OBJECTIVE BIOLOGICAL CRITERIA FOR ASSESSING AND CATEGORIZING SPECIES

Extinct

The species no longer exists anywhere in the world.

A species may be assessed as Extinct if:

- a) There is no remaining habitat for the species anywhere and there have been no records of the species anywhere despite recent surveys;
or
- b) There is enough available information to document that no individuals of the species remain alive anywhere.

Extirpated

The species no longer exists in the wild in the NWT but it does exist in the wild outside the NWT.

A species may be assessed as Extirpated if:

- a) There is no remaining habitat for the species in the NWT and there have been no records of the species in the NWT despite recent surveys;
or
- b) There is enough available information to document that no individuals of the species remain alive in the NWT.

Endangered

The species could be gone from the NWT in our human lifetime.

A species may be assessed as Endangered if:

- a) There is available evidence that the population is declining in such a way that it could disappear from the NWT in our human lifetime;
or
- b) There is available evidence that the range is limited and there is a decline or change in range, population size or habitat which could cause it to disappear from the NWT in our human lifetime;
or

- c) There is available evidence that the population size is small and there is a decline or change in population size that could cause it to disappear from the NWT in our human lifetime;
or
- d) There is available evidence that the population size is very small and there are threats that could cause it to disappear from the NWT in our human lifetime.

Where appropriate, SARC may use numerical thresholds to help clarify these criteria. The thresholds are given in Appendix A. Simple illustrations of these concepts are given in Appendix B.

Threatened

If nothing is done, the species could be gone from the NWT in our children's lifetime.

A species may be assessed as Threatened if:

- a) There is available evidence that the population is declining in such a way that it could disappear from the NWT in our children's lifetime;
or
- b) There is available evidence that the range is limited and there is a decline or change in range, population size or habitat such that it could disappear from the NWT in our children's lifetime;
or
- c) There is available evidence that the population size is small and there is a decline or change in population size such that it could disappear from the NWT in our children's lifetime;
or
- d) There is available evidence that the population size is small or the range is limited and there are threats that could cause it to disappear from the NWT in our children's lifetime.

Where appropriate, SARC may use numerical thresholds to help clarify these criteria. The thresholds are given in Appendix A. Simple illustrations of these concepts are given in Appendix B.

Special Concern

The species is particularly sensitive to human activities or natural events but is not Endangered or Threatened.

A species may be assessed as being of Special Concern if:

- a) The species has declined to a level at which its survival could be affected by population characteristics, genetic factors or environmental factors but the decline is not sufficient to qualify the species as Threatened;
or
- b) The species may become Threatened if negative factors are neither reversed nor managed effectively;
or
- c) The species almost qualifies for Threatened status;
or

- d) The species qualifies for Threatened status but there is a clear indication of rescue effect from populations elsewhere.

Examples of reasons why a species may qualify for Special Concern:

- A species that is particularly susceptible to a catastrophic event (e.g., a seabird population near an oil tanker route)
- A species with very restricted habitat for which a threat to that habitat has been identified (e.g., a bird that forages primarily in old-growth forest, a plant that grows primarily on undisturbed sand dunes, a fish that spawns primarily in estuaries)
- A species with very restricted food requirements for which a threat to that food supply has been identified (e.g., a snake that feeds primarily on a crayfish whose habitat is threatened by siltation)
- A recovering species no longer considered to be Threatened or Endangered but not yet clearly secure

Examples of reasons why a species may not qualify for Special Concern:

- A species existing at low density in the absence of recognized threat (e.g., a large predatory animal with a large home range)
- A species existing at low density that does not qualify for Threatened status for which there is a clear indication of rescue effect from populations elsewhere

Data Deficient

There is not enough available information to assess the species.

A species may be assessed as being Data Deficient if:

- a) The status report has fully investigated all the best available information, but there is not enough information to assess the species or assign status.

Examples of reasons why a species may qualify for data deficient:

- Records are too infrequent or too widespread to make any conclusions about range, population size, threats, or trends.
- Surveys to verify occurrences have not been sufficiently intensive or extensive or have not been conducted at the appropriate time of the year or under suitable conditions to ensure reliable conclusions.
- The species' occurrence in NWT cannot be confirmed or denied with confidence.

Examples of reasons why a species may not qualify for data deficient:

- The choice between two status designations is difficult to resolve by SARC.
- The status report is inadequate and has not fully investigated all best available information (in which case the report should be rejected).
- The information available is minimally sufficient to assign status but inadequate for recovery planning or other such use.

Not at Risk

The species has been assessed and is currently not at risk of extinction.

A species may be assessed as being Not at Risk if:

- a) The species has been assessed and it does not qualify for designation as Extinct, Extirpated, Endangered, Threatened, Special Concern or Data Deficient.

SECTION 5

STEP 5: CONSIDER THE SIGNIFICANCE OF IMMIGRATION FROM POPULATIONS ELSEWHERE

In addition to the assessment criteria, SARC may consider the significance of immigration from populations outside the NWT (or from other populations within the NWT).

Potential for rescue from populations elsewhere

The “rescue effect” is the immigration of members of a species that have a high probability of reproducing successfully. The immigrants may include spores, seeds, fruit, eggs, larvae, parts of individuals or entire individuals. If the potential for rescue is high, the risk of extinction may be reduced, and the status category may be downgraded.

If the species is common outside the NWT and there are no signs of population decline outside the NWT, and if the species is capable of dispersing to the NWT and there is (or soon will be) available habitat in the NWT, downgrading the status category is appropriate.

Dependence on populations elsewhere

If there is regularly a substantial amount of immigration but the NWT population still has poor survival, it suggests that the NWT population may be dependent on immigration for its long-term survival. If so, and if there are indications that the immigration will soon end, upgrading the status category may be appropriate.

The following questions may help to determine the significance of immigration:

Likelihood of immigration

- Are there any populations elsewhere that are close enough that immigrants could reach the NWT?
- Are there any effective barriers preventing dispersal to and from these other populations?
- Is the species capable of dispersing over long distances?
- Is the species known to disperse over long distances?

If there are no populations elsewhere or the species cannot disperse to the NWT, the potential for rescue is low and the status category should be left unchanged.

Evidence for the existence of local adaptations

- Are there any known differences in local adaptation between regional populations and populations elsewhere?
- Is it likely that individuals from populations elsewhere are adapted to survive in the NWT?

If it is unlikely that individuals from elsewhere would be able to survive in the NWT, the potential for rescue is low and the status category should be left unchanged.

Availability of suitable habitat

- Are current environmental conditions, including climate, suitable for immigrants to successfully establish themselves?
- Are there suitable patches of habitat in the NWT?
- Did the species disappear from the NWT because conditions were not favourable?
- Is habitat expected to improve in the foreseeable future because of current conservation measures?

If there is not enough suitable habitat, the potential for rescue is low and the status category should be left unchanged.

Status of populations elsewhere

- How abundant is the species outside the NWT?
- Are the populations elsewhere stable, increasing or decreasing?
- Are there any important threats to the populations elsewhere?
- Is it likely that the populations elsewhere produce a substantial number of emigrants, and will continue to do so in the future?

If populations elsewhere are declining, the potential for rescue is lower and downgrading the status category may not be appropriate.

Dependence on sources elsewhere

- Are NWT populations self-sustaining (i.e. have they shown a positive reproductive rate over the years)?
- Are NWT populations dependent on immigration for long-term survival (i.e. are they 'population sinks')?

If NWT populations are dependent on immigration for long-term survival, and there are indications that the immigration will soon end, upgrading the status category may be appropriate.

SECTION 6

STEP 6: CONSIDER THE SIGNIFICANCE OF OTHER BIOLOGICAL CHARACTERISTICS

In addition to the assessment criteria, SARC may consider the significance of other biological characteristics that may not have been adequately captured by the criteria. If these are thought to be significant they may be used to modify the initial assessment.

SARC may consider the degree to which life-history characteristics of the species affect its extinction probability. Examples of life-history characteristics are:

- age and size at maturity
- dispersal strategy
- longevity.

All else being equal:

- species with delayed age at maturity tend to be at greater risk of extinction than species with early age at maturity;
- for species that continue to grow after attaining maturity, larger species tend to be at greater risk of extinction than smaller species;
- species with low dispersal tend to be at greater risk of extinction than species with high dispersal; and
- species with non-overlapping generations tend to be at greater risk of extinction than species with overlapping generations.

SARC may also consider the degree to which the species may be vulnerable to 'Allee Effects' – where lower densities lead to lower population growth rates. Under these conditions, a species is less able to rebound from low densities. When the population shrinks below a certain density threshold, it can lead to extinction.

There are many possible causes of Allee Effects. SARC may consider how these apply to the species being assessed, and how they may affect its extinction probability. If Allee Effects are thought to be significant they may be used to modify the initial assessment.

Some of the possible negative effects of 'undercrowding' include:

- Increased risk of being eaten (predation);
- Difficulty finding mates;
- Difficulty achieving successful fertilization or pollination;
- Difficulty regulating body temperature;
- Lower efficiency in getting food or defending resources;
- Lower efficiency in raising young;
- Lower efficiency in finding shelter; and
- Inbreeding.

SECTION 7

STEP 7: CONSIDER WHETHER THE SUGGESTED STATUS MATCHES WITH THE DEFINITION

As the final step in assessment, SARC will consider whether the suggested status matches with the definition for the status category. If they don't match, the status with the best definition will take precedence and any disagreement between the definition and the criteria will be explained.

Definitions of species assessment categories:³

Extinct species: a species that no longer exists anywhere in the world.

Extirpated species: a species that no longer exists in the wild in the NWT but exists in the wild outside the NWT.

Endangered species: a species that is facing imminent extirpation from the NWT or extinction.

Threatened species: a species that is likely to become endangered in the NWT if nothing is done to reverse the factors leading to its extirpation or extinction.

Species of Special Concern: a species that may become threatened or endangered in the NWT because of a combination of biological characteristics and identified threats.

Species Not at Risk: a species that has been evaluated and found to be not at risk of extinction given the current circumstances.

Data Deficient Species: a species in respect of which SARC does not have sufficient information to categorize as extinct, extirpated, endangered, threatened, special concern, or not at risk.

³ Definitions of species assessment categories are from section 1(1) of the Act, except for 'Species Not at Risk', which is not defined in the Act and for which the COSEWIC definition is used.

APPENDICES

APPENDIX A1: THRESHOLDS FOR ENDANGERED AND THREATENED CRITERIA

Where appropriate, SARC may use numerical thresholds to help clarify the criteria for 'Endangered' and 'Threatened'.

Criteria details	Endangered	Threatened
The species could be gone from the NWT	50% probability	10% probability
Our human lifetime	50 years in the future	(not applicable)
Our children's lifetime	(not applicable)	75 years in the future

APPENDIX A2: COMPARISON BETWEEN SARC, COSEWIC, AND IUCN PROBABILITY OF EXTINCTION/EXTIRPATION

The Species at Risk Committee uses primarily qualitative assessment criteria as described in the preceding pages. This differs from the primarily quantitative approach taken by the International Union for the Conservation of Nature and Natural Resources (IUCN) and the Committee on the Status of Endangered Wildlife in Canada (COSEWIC).

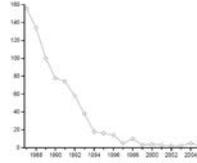
SARC's qualitative assessment criteria reflect a northern perspective in that criteria should be relevant and meaningful to people, who are part of the ecosystem they are working together to protect now and for future generations.

For better understanding of SARC's assessments of species as Endangered and Threatened in the Northwest Territories, the following table compares them with the respective probability of extinction or extirpation used by others in Canada and the world. Please note that these comparisons are provided only for convenience.

	SARC		IUCN		
	Endangered	Threatened	Critically Endangered	Endangered (=COSEWIC Endangered)	Vulnerable (=COSEWIC Threatened)
Probability of extirpation or extinction in the wild	≥50% in 50 years	≥10% in 75 years	≥50% in 10 years or 3 generations, whichever is longer (100 years max.)	≥20% in 20 years or 5 generations, whichever is longer (100 years max.)	≥10% in 100 years

APPENDIX B: ILLUSTRATIONS OF CONCEPTS IN ENDANGERED AND THREATENED CRITERIA

Criterion (A) Population is declining



Criterion (B) Range is limited + decline or change in range, population size or habitat

RANGE IS LIMITED



AND

DECLINE IN
POPULATION
SIZE



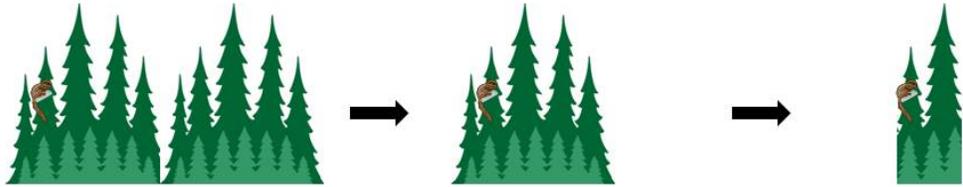
OR

DECLINE IN
RANGE



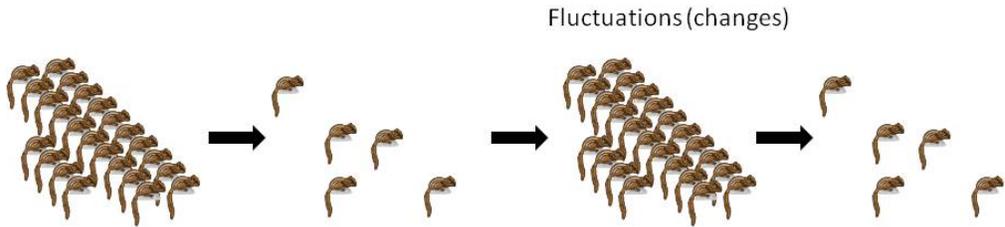
OR

DECLINE IN
HABITAT



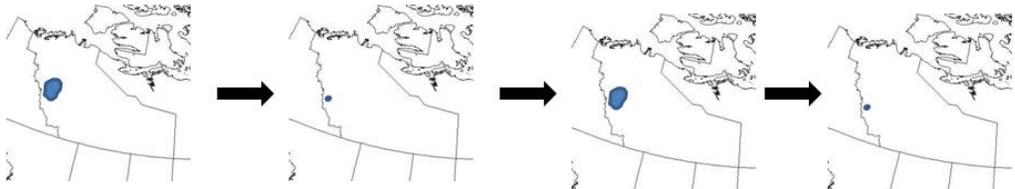
OR

CHANGE IN
POPULATION
SIZE



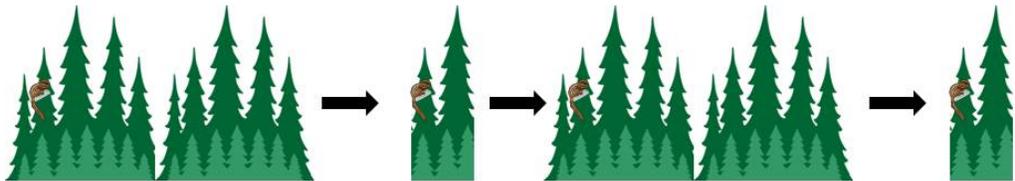
OR

CHANGE IN
RANGE



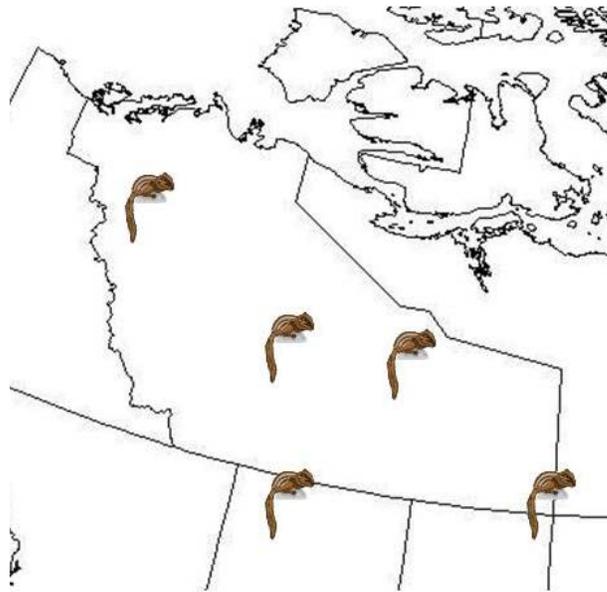
OR

CHANGE IN
HABITAT



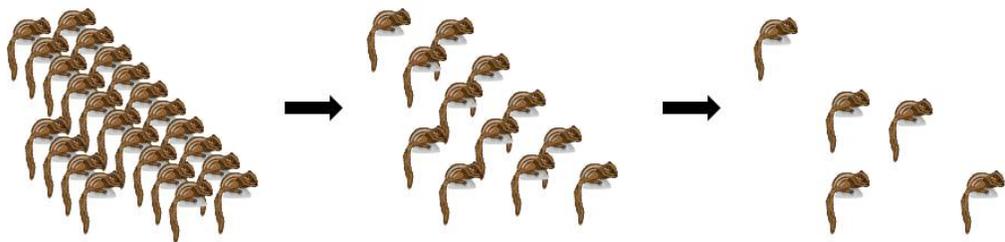
Criterion (C) Population size is small + decline or change in population size

POPULATION SIZE
IS SMALL



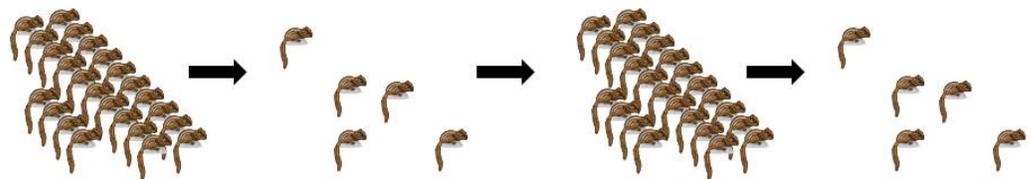
AND

DECLINE IN
POPULATION
SIZE



OR

CHANGE IN
POPULATION
SIZE



Criterion (D) Population size is small + threats



Criterion (D) Range is limited + threats (*Does not apply for 'Endangered')



GLOSSARY

DEFINITIONS OF TECHNICAL TERMS⁴ USED IN THRESHOLDS

Area of Occupancy: The area within 'extent of occurrence' that is occupied by a species, excluding cases of vagrancy. The measure reflects the fact that the extent of occurrence may contain unsuitable or unoccupied habitats. In some cases (e.g. irreplaceable colonial nesting sites, or crucial feeding sites for migratory species) the area of occupancy is the smallest area essential at any stage to the survival of existing populations of a species (in such cases, this area of occupancy does not need to occur within NWT). The size of the area of occupancy will be a function of the scale at which it is measured, and should be at a scale appropriate to relevant biological aspects of the species, the nature of threats and the available data. To avoid inconsistencies and bias in assessments caused by estimating area of occupancy at different scales, it may be necessary to standardize estimates by applying a scale-correction factor. Different types of species have different scale-area relationships. An index of area of occupancy may be calculated following Appendix F6 in the COSEWIC Operations and Procedures Manual, November 2009 version.

Continuing Decline: A recent, current or projected future decline (which may be smooth, irregular or sporadic), that is liable to continue unless remedial measures are taken. Fluctuations will not normally count as continuing declines, but an observed decline should not be considered as a fluctuation unless there is evidence for this.

Estimated: Information that is based on calculations that may include statistical assumptions about sampling, or biological assumptions about the relationship between an observed variable (e.g., an index of abundance) to the variable of interest (e.g., number of mature individuals). These assumptions should be stated and justified in the documentation. Estimation may also involve interpolation in time to calculate the variable of interest for a particular step (e.g., a 10-year reduction based on observations or estimations of population size 5 and 15 years).

Extent of Occurrence: The area included in a polygon without concave angles that encompasses the geographic distribution of all known populations of a species.

Extreme Fluctuation: Changes in distribution or in the total number of mature individuals of a species that occur rapidly and frequently, and are typically of more than one order of magnitude (tenfold).

Generation: Generation length is the average age of parents of a cohort (i.e. newborn individuals in the population). Generation length therefore reflects the turnover rate of breeding individuals in a population. Generation length is greater than the age at first breeding and less than the age of the oldest breeding individual, except in species that breed only once. Where generation length varies under threat, the more natural, i.e. predisturbance, generation length should be used.

⁴ Definitions of terms follow those of the COSEWIC, which in turn are based on those of the International Union for the Conservation of Nature and Natural Resources (IUCN), with minor adjustments for Northwest Territories (NWT) circumstances and conditions.

Inferred: Information that is based on indirect evidence, on variables that are indirectly related to the variable of interest, but in the same general type of units (e.g., number of individuals or area or number of subpopulations). Inferred values rely on more assumptions than estimated values. Inference may also involve extrapolating an observed or estimated quantity from known subpopulations to calculate the same quantity for other subpopulations. Whether there are enough data to make such an inference will depend on how large the known subpopulations are as a proportion of the whole populations, and the applicability of the threats and trends observed in the known subpopulations to the rest of the taxon. The method of extrapolating to unknown subpopulations depends on the criteria and on the type of data available for the known subpopulations.

Location: The term 'location' defines a geographically or ecologically distinct area in which a single threatening event can rapidly affect all individuals of the species present. The size of the location depends on the area covered by the threatening event and may include part of one or many subpopulations. Where a species is affected by more than one threatening event, location should be defined by considering the most serious plausible threat.

Mature Individuals (Number of): The number of mature individuals is the number of individuals known, estimated or inferred to be capable of reproduction. When estimating this quantity, the following points should be borne in mind:

- Mature individuals that will never produce new recruits should not be counted (e.g. densities are too low for fertilization).
- In the case of populations with biased adult or breeding sex ratios, it is appropriate to use lower estimates for the number of mature individuals that take this into account.
- Where the population size fluctuates, use a lower estimate. In most cases this will be much less than the mean.
- Reproducing units within a clone should be counted as individuals, except where such units are unable to survive alone (e.g. corals).
- In the case of species that naturally lose all or a subset of mature individuals at some point in their life cycle, the estimate should be made at the appropriate time, when mature individuals are available for breeding.
- Re-introduced individuals must have produced viable offspring before they are counted as mature individuals.

Observed: Information that is directly based on well-documented observations of all known individuals in the population.

Population: A geographically or otherwise distinct group within a species that has little demographic or genetic exchange with other such groups. Theoretically, populations maintain genetic distinction if there is typically less than one successful breeding immigrant individual or gamete per generation. Equivalent to the term "subpopulation" as employed by the IUCN. See also "Distinct Population".

Projected: Same as "estimated", but the variable of interest is extrapolated in time towards the future. Projected variables require a discussion of the method of extrapolation (e.g., justification of the statistical assumptions or the population model used) as well as the extrapolation of current or potential threats into the future, including their rates of change.

Reduction: A reduction is a decline in the number of mature individuals of at least the amount (%) stated under quantitative criterion A over the time period (years) specified, although the decline need not be continuing. A reduction should not be interpreted as part of a fluctuation unless there is reasonable evidence for this. The downward phase of a fluctuation will not normally count as a reduction.

Severely Fragmented: A situation where most individuals are found in small and relatively isolated populations (in certain circumstances this may be inferred from habitat information). Severe fragmentation results in a reduced probability of recolonization of habitat patches where populations go extinct, which increases extinction risk for the species.

Suspected: Information that is based on circumstantial evidence, or on variables in different types of units. For example, evidence of qualitative habitat loss can be used to infer that there is a qualitative (continuing) decline, whereas evidence of the amount of habitat loss can be used to suspect a population reduction at a particular rate. In general, a suspected population reduction can be based on any factor related to population abundance or distribution, including the effects of (or dependence on) other species, so long as the relevance of these factors can be reasonably supported.

Total Population: The total number of mature individuals of a species in NWT. Equivalent to the term "population" as employed by IUCN 2001.