NORTHWEST TERRITORIES
SPECIES AT RISK COMMITTEE

SPECIES AT RISK COMMITTEE (SARC) SPECIES ASSESSMENT PROCESS

BACKGROUND FROM THE SPECIES AT RISK (NWT) ACT

The *Species at Risk (NWT) Act* (2009; hereafter referred to as 'the Act') includes the following guidance with respect to species assessments:

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 species[1].

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.

31(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[2].

31(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,

[1] In this document, 'species' refers to a species, subspecies, or distinct population to which the Act applies.
[2] This clause ensures that SARC's assessments are independent, and that SARC members are not lobbied or pressured by outside interests. This does not imply that all socio-economic considerations, including, in particular, biocultural changes affecting a species (see section 4 for more details), must be absent from the status report or assessment; merely that potential future implications of an assessment must not be considered.

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(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.

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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 criteria (see section 4). What status is suggested?
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 decline in abundance, summarize information substantiating this decline, as appropriate to the knowledge system (Indigenous and community knowledge or scientific knowledge),
- 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).

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NORTHWEST TERRITORIES
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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 (defined in section 2 of the *Fisheries Act* (Canada)[3]),
- a marine plant (as defined in section 47 of the *Fisheries Act* (Canada)), or
- a migratory bird (as defined in subsection 2(1) of the *Migratory Birds Convention Act, 1994* (Canada)).

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

- wild by nature, **and**
- indigenous to the 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 (see 'Further interpretation by SARC', below, for additional guidance on distinct populations).

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.

[3] Unless there is an agreement between the Minister of Environment and Natural Resources and the Government of Canada that SARC should assess it. The same is true regarding the assessment of marine plants and migratory birds by SARC (an agreement is required).

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- 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 population. 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 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:

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).

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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:

As noted above, the 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).

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SECTION 2

STEP 2: APPROVE THE SPECIES STATUS REPORT

Guidance on preparing species status reports is provided in three separate documents:

- General Guidelines for Species Status Reports,
- Detailed Instructions for Preparation of a SARC Status Report: Indigenous[4] and Community Knowledge Component, and
- Detailed Instructions for Preparation of a SARC Status Report: Scientific Knowledge Component

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?

[4] This differs slightly from the term 'traditional and community knowledge' in the Act. In line with shifts in organizational terminology, SARC agrees that the term 'traditional' should be replaced with 'Indigenous'. The term 'traditional' is felt to limit the reader to interpretations of these knowledges as historical only. The term 'Indigenous' allows the reader to understand more clearly that these knowledges are relevant in the present tense as well, as they adapt and evolve over time. This is not intended to change the meaning of the term in the legislation, but simply to reflect evolving standards for language.

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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.

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SECTION 4

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

The Species at Risk Committee (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.

Overall, the appearance and application of these criteria now differ markedly from those used by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC)[5] and the International Union for the Conservation of Nature (IUCN)[6]. This reflects SARC's interest in, and mandate to, base its assessments on Indigenous[7], community, and scientific knowledge.

Globally, accepted standards for species at risk assessments are based strongly in western science, with Indigenous and community knowledge incorporated into that framework[8,9,10]. In this situation, wherein Indigenous and community knowledge is added to a structure determined by western science, it is likely to be misinterpreted or taken out of context; or, where it doesn't align with scientific results, pushed aside entirely[8,9].

Although expanding the role of Indigenous and community knowledge in species assessments has been contemplated[10,11], the use of western science in species assessments is thought to be necessary for maintaining high standards of scientific credibility[12] and defending against criticism and attacks from outside interest groups[10].

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[5] https://www.canada.ca/content/dam/eccc/migration/cosewic-cosepac/94d0444d-369c-49ed-a586-ec00c3fef69b/assessment_process_and_criteria_e.pdf

[6] https://www.iucnredlist.org/resources/categories-and-criteria

[7] This differs slightly from the term 'traditional and community knowledge' used in the Act. In line with shifts in organizational terminology, SARC agrees that the term 'traditional' should be replaced with 'Indigenous'. The term 'traditional' is felt to limit the reader to interpretations of these knowledges as historical only. The term 'Indigenous' allows the reader to understand more clearly that these knowledges are relevant in the present tense as well, as they adapt and evolve over time. This is not intended to change the meaning of the term in the legislation, but simply to reflect evolving standards for language.

[8] Nadasty, P. 2003. Reevaluating the co-management success story. Arctic 56(4): 367-380.

[9] Houde, N. 2007. The six faces of traditional ecological knowledge: challenges and opportunities for Canadian co-management arrangements. Ecology and Society 12(2): 34.

[10] Integrating Traditional Knowledge into Red List Assessments. Website: https://www.iucn.org/sites/dev/files/content/documents/tk_workshop_summary_draft_1.pdf

[11] Guidance for Integrating Indigenous and Local Knowledge in IUCN Red List Assessments. Website: https://www.iucn.org/sites/dev/files/final_guidance_for_ilk_-_for_commission_sign_off.pdf

[12] McNeely, J.E. and R.J. Hunka. 2011. Policy Critique of the Draft Species at Risk Act Overarching Policy Framework. Website: https://ikanawtiket.ca/pdf/SARAPolicy11.pdf

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As such, it has been difficult to gain significant traction in shifting species assessment criteria in a manner that provides room for Indigenous systems of knowledge.

SARC contends, however, that in accepting Indigenous and community knowledges as systems of knowing in their own right, the structure of species assessment systems must be reconsidered entirely. The parameters used for scientifically-based assessments make it difficult for Indigenous and community knowledge holders to participate on an equal footing with scientists. Indigenous and community knowledge holders' understandings of abundance, for instance, do not often translate well into percentage decline over time[13]. The assessment criteria must therefore be rethought and rebuilt in a manner that recognizes the local, holistic, eco-centric, and social-spiritual context of Indigenous knowledges.

This is the view from which these guidelines were developed, in line with the Two-eyed Seeing Approach[14], and consistent with Article 8(j) of the Convention on Biological Diversity[15] and the recommendations of McNeely and Hunka (2011)[16] in their critique of the federal *Species at Risk Act*'s policy framework.

In order to address the unique characteristics of each knowledge type, two separate sets of objective biological criteria are used by SARC, based in Indigenous and community knowledge and scientific knowledge, respectively[17]. The knowledge-specific

[13] Integrating Traditional Knowledge into Red List Assessments. Website: https://www.iucn.org/sites/dev/files/content/documents/tk_workshop_summary_draft_1.pdf

[14] "The advancement of the Two-Eyed Seeing Approach is largely accredited to Mi'kmaq Elder Albert Marshall to advance our collective (Aboriginal Peoples and non-Aboriginal Peoples) understanding about the natural world. Two-Eyed Seeing recognizes that both ATK and western science have valuable insights and contributions toward understanding the natural world. However, each is also limited in certain aspects. For example, benefits include: for ATK, a long-term and ecosystem based knowledge; and for western science, an ability to conduct controlled testing to achieve repeatable results. Drawbacks include: for ATK, a subjectivity of the ATK-holder to time and place; and for western science, the inability to grasp many cause and effect relationships existing simultaneously within a large living ecosystem. The approach of Two-Eyed Seeing is to recognize that each 'science' is different and cannot be directly compared to the other; but a person who understands both 'sciences' has a more holistic and more realistic view, better than what either 'science' can capture on its own." (McNeely and Hunka 2011)

[15] Subject to national legislation, respect, preserve, and maintain knowledge, innovations, and practices of Indigenous and local communities embodying traditional lifestyles relevant for the conservation and sustainable use of biological diversity and promote their wider application with the approval and involvement of the holders of such knowledge, innovations, and practices, and encourage the equitable sharing of the benefits arising from the utilization of such knowledge, innovations, and practices.

[16] McNeely, J.E. and R.J. Hunka. 2011. Policy Critique of the Draft Species at Risk Act Overarching Policy Framework. Website: https://ikanawtiket.ca/pdf/SARAPolicy11.pdf

[17] Indigenous and community knowledge criteria were developed by SARC for use in this document. Scientific knowledge criteria are consistent with that used by the Committee on the Status of Endangered Wildlife in Canada and the International Union for the Conservation of Nature.

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criteria are considered one at a time, allowing SARC to focus on each knowledge system in turn. All members of SARC, regardless of the knowledge system that best represents their expertise, participate throughout the process, allowing experts in different fields to learn from one another, while working towards a species assessment supported by all best available information. This reflects strong cross-cultural respect among SARC members and a willingness to work through difficult topics together. The final species assessment can be supported by criteria from either (or both) knowledge systems, as described below, as appropriate. In the case that the final status report includes only one component[18] (i.e., either the Indigenous and community knowledge component or the scientific knowledge component), then the assessment is completed using criteria from only that knowledge system.

In approaching assessments in this manner, SARC hopes that room is provided for both knowledge systems to exist and interact as equals. To ensure this is achieved, the effectiveness of these guidelines will be reviewed regularly by SARC.

In the application of these guidelines, it is important to understand that Indigenous and community knowledge is strongly linked to people and place, and is inherently context-specific[19]. In this sense, it cannot be thought of as a 'single' knowledge, and will vary within and among regions[20].

[18] This may be the case where documented information is largely or entirely available for only one component.
[19] Nadasty, P. 2003. Reevaluating the co-management success story. Arctic 56(4): 367-380.
[20] McNeely, J.E. and R.J. Hunka. 2011. Policy Critique of the Draft Species at Risk Act Overarching Policy Framework. Website: https://ikanawtiket.ca/pdf/SARAPolicy11.pdf

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OBJECTIVE BIOLOGICAL CRITERIA FOR ASSESSING AND CATEGORIZING SPECIES – INDIGENOUS AND COMMUNITY KNOWLEDGE

Extinct – The species[21] no longer exists anywhere in the world.

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 Extinct or Extirpated if:

Criterion	Extinct	Extirpated
ICK(a)[22]	There is enough information to know that *no individuals* of the species remain alive in the *world* **OR**	There is enough information to know that *no individuals* of the species remain alive in the *NWT* **OR**
ICK (b)	There is enough information to know that there is *no remaining habitat* for the species anywhere in the *world* **AND** there have been *no recent observations* of individuals of the species.	There is enough information to know that there is *no remaining habitat* for the species anywhere in the *NWT* **AND** there have been *no recent observations* of individuals of the species.

Extinct or Extirpated should be used in cases where the best available information indicates the species is gone from the world or the NWT, respectively. If the species hasn't been observed primarily because it is not commonly seen/looked for, then this status should not be used (Data Deficient is likely more appropriate).

Endangered – The species is facing imminent extirpation from the NWT or extinction.

This means, for example that:

- Knowledge holders frequently and strongly express fear that the species is likely to be gone from the NWT in the near-term future such that their grandchildren may not be able to observe them,

[21] Where the objective biological criteria refer to a 'species', this can be interpreted to mean 'species, subspecies, or distinct population', as appropriate, depending on the unit identified for assessment.
[22] This coding is used to simply presentation of supporting criteria in the final assessment report. 'ICK' means 'Indigenous and community knowledge'.

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- It is currently impossible to maintain cultural practices related to this species or its habitat (e.g., harvesting/sharing)[23],
- There aren't very many of the species left, or
- Decisive action needs to be taken immediately to prevent the disappearance of the species.

Threatened – The species is likely to become Endangered in the NWT if nothing is done to reverse the factors leading to its extirpation or extinction.

This means, for example that:

- Knowledge holders express concern that the species' medium- to long-term future may be uncertain,
- Knowledge holders are already observing a reduced ability for future generations to maintain their cultural practices related to the species or its habitat[24], or
- Interventions are required to support the species' recovery.

A species may be assessed as Endangered or Threatened if:

Criterion	Endangered	Threatened
ICK(a)	Knowledge holders have observed such *important and widespread declines* in abundance[25], habitat quality/quantity, movements, or range that *significant adverse impacts* to Indigenous cultures and traditional ways of life tied to the species or its habitat have advanced to a point that *continued cultural connection to this species has been made impossible or is extremely impaired*	Knowledge holders have observed *enough declines* in abundance, habitat quality/quantity, movements, or range use that *adverse impacts* to Indigenous cultures and traditional ways of life tied to the species or its habitat *are underway in most of the range* **OR**

[23] Tied to a change or decline in the species or its habitat, rather than a change in how people choose to participate in established cultural practices.
[24] Tied to a change or decline in the species or its habitat, rather than a change in how people choose to participate in established cultural practices.
[25] Abundance of the species in the NWT can be spoken about using terminology consistent with how knowledge holders characterize abundance (accessibility, observability, group sizes, harvest success).

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	OR	
ICK(b)	It is *generally agreed* that the species is observed *far less frequently* than in the past in a large portion of its range, such that it is a topic of *frequent conversation*[26] *and high concern* **AND** there is little indication that the species has simply moved elsewhere **OR**	There are *increasing reports* that the species is observed *less frequently* than in the past in a large portion of its range, such that it is an *increasingly common topic of conversation* and a *moderate concern* **AND** there is little indication that the species has simply moved elsewhere **OR**
ICK(c)	It is *generally agreed* that the species is observed *less frequently* than in the past in a large portion of its range **AND** is understood by knowledge holders to be *very sensitive* to natural or human-caused threats **AND** knowledge holders express *high* concern about *widespread threats* impacting the species **OR**	There are *increasing reports* that the species is observed *less frequently* than in the past in a large portion of its range **AND** is understood by knowledge holders to be *somewhat sensitive* to natural or human-caused threats **AND** knowledge holders *often* express concern about threats impacting the species **OR**
ICK(d)	It is *generally agreed* that the species' overall range has *contracted substantially*, such that the species is *not observed, or is largely not observed,* in areas where it was historically present, in a manner that is outside normal patterns **AND** there is little indication that the species has simply moved elsewhere **OR**	There are *increasing reports* that the species' range is *contracting noticeably*, such that it is *increasingly difficult to observe* in areas where it was historically present, in a manner that is outside normal patterns **AND** there is little indication that the species has simply moved elsewhere **OR**

[26] Note that this reflects not just simple conversation/topic frequency, but also an escalation in the conversation as relative importance increases. For example, there is typically a progression from family-level observations/ concerns, to the community level, then the regional level, culminating in concerns expressed at higher levels of governance (Indigenous governments communicating with their territorial/federal counterparts to address the concern).

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ICK(e)	There is concern expressed by knowledge holders that the species is *likely to disappear* from the NWT within their grandchildren's lifetimes.	There is concern expressed by knowledge holders that the species is *likely to experience severe declines* in the NWT, in its abundance, habitat quality/quantity, movements, and/or range, within their grandchildren's lifetimes.

Special Concern – A species that may become Threatened or Endangered in the NWT because of a combination of biological characteristics and identified threats.

This means, for example, that the species has few offspring[27], moves very slowly or not very widely[28], or has very specific, important habitat components[29], and is facing pressure from one or more threats (natural or human-caused) that, if not effectively addressed and managed, may result in the species becoming Threatened.

A species may be assessed as Special Concern if:

Criterion	Special Concern
ICK(a)	Knowledge holders are observing *changes* in abundance, habitat quality/quantity, movements, or range, but these changes are *not yet large enough to qualify the species for Threatened* **AND** knowledge holders express concern that the species is being *adversely impacted* by one or more natural or human-caused *threats* **OR**
ICK(b)	The species displays *characteristics* that are likely to negatively affect its response to decline **AND** knowledge holders express concern that the species is being *adversely impacted* by one or more natural or human-caused *threats* that could cause the species to become Threatened if *not effectively addressed and managed* **OR**
ICK(c)	The species almost qualifies for Threatened status, under any criterion.

[27] For example, reproduces relatively late in life, has few or very few offspring, only sets a small number of seeds, etc.
[28] For example, will have a hard time moving somewhere else if its habitat becomes unsuitable.
[29] For example, salt licks, ice patch habitat, karst habitat, hot spring habitat, has a very specific food that it eats, etc.

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<u>Data Deficient</u> - 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.

Data Deficient should be used for cases where the status report has fully investigated all best available information, yet that information is insufficient to satisfy any criteria or assign any status or resolve the species' eligibility for assessment.

Examples:

- Observations are typically (i.e., normally) too infrequent or patchy to make any conclusions about changes in abundance, range size, or threats.
- The species' occurrence in the NWT cannot be confirmed or denied with assurance.

Data Deficient should not be used if 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), or the information available is minimally sufficient to assign status but inadequate for recovery planning or other such use.

<u>Not at Risk</u> - A species that has been evaluated and found to be not at risk of extinction given the current circumstances.

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OBJECTIVE BIOLOGICAL CRITERIA FOR ASSESSING AND CATEGORIZING SPECIES – SCIENTIFIC KNOWLEDGE PRELIMINARY ASSESSMENT[30]

Extinct - A species that no longer exists anywhere in the world.

Extirpated - A species that no longer exists in the wild in the NWT but exists in the wild outside the NWT.

A species may be assessed as Extinct or Extirpated if:

Criterion	Extinct	Extirpated
SK(a)	There exists no remaining habitat for the species in the *world* **AND** there have been no records of the species despite recent surveys **OR**	There exists no remaining habitat for the species in the *NWT* **AND** there have been no records of the species despite recent surveys **OR**
SK(b)	50 years have passed since the last credible record of the species in the *world*, despite surveys in the interim **OR**	50 years have passed since the last credible record of the species in the *NWT*, despite surveys in the interim **OR**
SK(c)	There is sufficient information to document that no individuals of the species remain alive in the *world*.	There is sufficient information to document that no individuals of the species remain alive in the *NWT*.

[30] Criteria for scientific knowledge are drawn from the criteria used by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) and the International Union for the Conservation of Nature (IUCN).

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Endangered - A species that is facing imminent extirpation from the NWT or extinction.

Threatened - 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.

A species may be assessed as Endangered or Threatened if:

<table>
<tr><th colspan="4">A. Population size reduction (measured over the longer of 10 years or 3 generations) based on any of SK(A1 to A4).</th></tr>
<tr><th>Criterion</th><th>Endangered</th><th colspan="2">Threatened</th></tr>
<tr><td>SK(A1)</td><td>≥70%</td><td colspan="2">≥50%</td></tr>
<tr><td>SK(A2, A3, and A4)</td><td>≥50%</td><td colspan="2">≥30%</td></tr>
<tr><td>SK(A1) Population reduction[31] observed, estimated, inferred, or suspected in the past where the causes of the decline are clearly reversible AND understood AND have ceased.

SK(A2) Population reduction observed, estimated, inferred, or suspected in the past where the causes of the reduction may not have ceased OR may not be understood OR may not be reversible.

SK(A3) Population reduction projected or suspected to be met in the future (up to a maximum of 100 years) [(a) cannot be used for A3].

SK(A4) An observed, estimated, inferred, projected, or suspected population reduction where the time period must include both the past and the future (up to a max. of 100 years in future), and where the causes of the reduction may not have ceased OR may not be understood OR may not be reversible.</td><td>based on any of the following:</td><td colspan="2">(a) direct observation [except A3]
(b) an index of abundance appropriate to the taxon
(c) a decline in area of occupancy, extent of occurrence, or habitat quality
(d) actual or potential levels of exploitation
(e) effects of introduced taxa, hybridization, pathogens, pollutants, competitors, or parasites.</td></tr>
</table>

[31] For all SK(A) criteria, population reduction means a reduction in the total number of mature individuals.

B. Geographic range in the form of either SK(B1) (extent of occurrence) OR SK(B2) (area of occupancy).		
Criterion	**Endangered**	**Threatened**
SK(B1) Extent of occurrence =	<5,000km^2	<20,000km^2
SK(B2) Area of occupancy =	<500km^2	<2,000km^2
AND at least 2 of the following 3 conditions:		
(a) Severely fragmented **OR** number of locations =	≤5	≤10
(b) *Continuing decline,* observed, estimated, inferred, or projected, in any of: (i) extent of occurrence, (ii) area of occupancy, (iii) area, extent, or quality of habitat, (iv) number of locations or subpopulations, (v) number of mature individuals.		
(c) *Extreme fluctuations* in any of: (i) extent of occurrence, (ii) area of occupancy, (iii) number of locations or subpopulations, (iv) number of mature individuals.		
C. Small population size and decline		
Criterion	**Endangered**	**Threatened**
Number of mature individuals =	<2,500	<10,000
AND at least one of SK(C1) or (C2)		
SK(C1) An estimated *continuing decline* in total number of mature individuals of at least (up to a max. of 100 years in the future):	20% in 5 years or 2 generations (whichever is longer)	10% in 10 years or 3 generations (whichever is longer)
SK(C2) An observed, projected, or inferred *continuing decline* in the number of mature individuals **AND** at least one of (a)(i) or		

(a)(ii) or (b):			
(a)	(i) Number of mature individuals *in each subpopulation* =	≤250	≤1,000
	(ii) % of mature individuals *in one subpopulation* =	95-100%	100%
(b)	*Extreme fluctuations* in the number of mature individuals.		
D. Very small or restricted population			
Criterion		**Endangered**	**Threatened**
SK(D1) *Number* of mature individuals		<250	<1,000
SK(D2) *Restricted* area of occupancy or number of locations such that it is prone to the effects of human activities or stochastic events within a very short time period (1-2 generations) in an uncertain future, and is thus capable of becoming Extinct, Extirpated or Critically Endangered *[see text on next page for guidance]* in a very short period of time *[only applies to the Threatened category]*.		-	typically area of occupancy <20km^2 or number of locations ≤5
E. Quantitative analysis			
Criterion		**Endangered**	**Threatened**
SK(E) Indicating the *probability of extinction* in the wild to be:		≥20% in 20 years or 5 generations, whichever is longer (100 years max.)	≥10% in 100 years

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***Critically Endangered (used only to inform application of D2)**

The *Species at Risk (NWT) Act* does not allow for a possible status of Critically Endangered; however, these criteria are useful in understanding whether or not a species is facing the extremely high risk of extinction in the wild required by D2. Criteria thresholds for Critically Endangered are as defined by the IUCN. Threshold changes from Endangered are as follows:

A Criterion:

SK(A1), ≥90% population reduction.

SK (A2, A3, or A4), ≥80% population reduction.

B Criterion:

SK(B1), EOO <100 km^2.

SK(B2), IAO <10 km^2.

(a) severely fragmented or number of locations is changed to = 1.

C Criterion:

SK(C1), an estimated continuing decline in total number of mature individuals of at least 25% in 3 years or 1 generation, whichever is longer.

SK(C2), a continuing decline, observed, projected, or inferred, in numbers of mature individuals and at least one of the following:

a(i) no subpopulation estimated to contain <50 mature individuals.

a(ii) one subpopulation has 90-100% of mature individuals.

SK(D1) Criterion: population estimated to have <50 mature individuals.

SK(E) Criterion: quantitative analysis (population projections) showing the probability of extinction or extirpation in the wild is at least 50% within 10 years or 3 generations, whichever is longer, up to a maximum of 100 years.

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Special Concern – A species that may become Threatened or Endangered in the NWT because of a combination of biological characteristics and identified threats.

A species may be assessed as Special Concern if:

Criterion	Special Concern
SK(a)	The species has *declined* to a level of abundance at which its *persistence is increasingly threatened* by genetic, demographic, or environmental stochasticity, but the decline is *not sufficient to qualify the species as Threatened* **OR**
SK(b)	The species *may become Threatened* if factors suspected of negatively influencing the persistence of the species are *neither reversed nor managed* with demonstrable effectiveness **OR**
SK(c)	The species is *near to qualifying*, under any criterion, for Threatened status **OR**
SK(d)	The species qualifies for Threatened status but there is *clear indication of rescue effect* from extra-limital subpopulations.

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 or food requirements for which a threat to that habitat or food supply 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 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 defending a large home range or territory).

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- A species existing at low density that does not qualify for Threatened status, for which there is a clear indication of rescue effect.

<u>Data Deficient</u> - 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.

Data Deficient should be used for cases where the status report has fully investigated all best available information yet that information is insufficient to satisfy any criteria or assign any status, or resolve the species' eligibility for assessment.

Examples:

- Records of occurrence are too infrequent or too widespread to make any conclusions about extent of occurrence, population size, threats, or trends.
- Surveys to verify occurrences, when undertaken, have not be sufficiently intensive or extensive or have not been conducted at the appropriate time of the year or under suitable conductions to ensure the reliability of the conclusions drawn from the data gathered.
- The species' occurrence in the NWT cannot be confirmed or denied with assurance.

Data Deficient should not be used if 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), or the information available is minimally sufficient to assign status but inadequate for recovery planning or other such use.

<u>Not at Risk</u> - A species that has been evaluated and found to be not at risk of extinction given the current circumstances.

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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.

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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')?

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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.

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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 a maturity,
- Dispersal strategy, and
- 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, large 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.

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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[32]:

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

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

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

Threatened: 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.

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

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

Data Deficient: 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.

[32] Definitions of species assessment categories are from subsection 1(1) of the Act, except for Not at Risk, which is not defined in the Act and for which the COSEWIC definition is used.

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GLOSSARY

DEFINITIONS OF TECHNICAL TERMS[33] 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.

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[33] Definitions of terms follow those of the COSEWIC, which in turn are based on those of the International Union for the Conservation of Nature (IUCN), with minor adjustments for NWT circumstances and conditions. Many of these definitions apply only to the scientific knowledge criteria.

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., pre-disturbance, generation length should be used.

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 SK(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 the IUCN.

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