

COSEWIC Annual Report

presented to

The Minister of the Environment

and

**The Canadian Endangered
Species Conservation Council
(CESCC)**

from

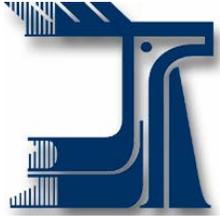
**The Committee on the Status
of Endangered Wildlife in Canada
(COSEWIC)**

2007



COSEWIC
Committee on the
Status of Endangered
Wildlife in Canada

COSEPAC
Comité sur la
situation des espèces
en péril au Canada



COSEWIC
(COMMITTEE ON THE
STATUS OF ENDANGERED
WILDLIFE IN CANADA)

COSEPAC
(COMITÉ SUR LA SITUATION
DES ESPÈCES EN PÉRIL
AU CANADA)

August 30, 2007

The Honourable John Baird
Minister of the Environment
Les Terrasses de la Chaudière
10 Wellington Street
28th Floor
Gatineau, Québec
K1A 0H3

Dear Minister Baird,

Please find enclosed the 2006-2007 Annual Report of the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) which I respectfully submit to you and to the Canadian Endangered Species Conservation Council (CESCC), thus fulfilling the obligations to COSEWIC under Section 25 and 26 of the *Species at Risk Act* (SARA). Please be advised that this report is available online at http://www.sararegistry.gc.ca/gen_info/cosewic_annual_e.cfm

COSEWIC has played a fundamentally important role as a catalyst to the conservation of Canada's biodiversity for three decades, the year 2007 marking 30 years since COSEWIC's inception in 1977. To date, COSEWIC has assessed 552 species in various risk categories, including 222 Endangered, 139 Threatened, 156 Special Concern, and 22 Extirpated Species. In addition, 13 species have been assessed as Extinct.

I would like to draw your attention to several items in the attached report provided for information and, where indicated, for approval.

Item I (COSEWIC Activities)

In November 2006, COSEWIC assessed/reassessed the status of 16 wildlife species. The species assessment results can be summarized as follows: Endangered – 8; Threatened – 2; Special Concern – 4. Two species were assessed as Not at Risk. Following previous assessment and deferral in 2006, COSEWIC submits herein its reassessment of eight designatable units of the Lake Sturgeon (*Acipenser fulvescens*) for inclusion in Schedule 1 of SARA. Following previous assessment and deferral in 2006, the British Columbia population (Special Concern) and the Alberta population (Threatened) assessments of the Westslope Cutthroat Trout (*Oncorhynchus clarkia lewisi*) have been confirmed. COSEWIC

submits these status assessments for inclusion in Schedule 1 of SARA. Scouler's Corydalis (*Corydalis scouleri*) was reassessed as a species no longer at risk, based on an unsolicited status report received by COSEWIC from the British Columbia Ministry of the Environment. This species had been previously assessed by COSEWIC as Threatened in 2001 and is on Schedule 1 of SARA.

In April 2007, COSEWIC assessed/reassessed the status of 48 wildlife species. The species assessment results can be summarized as follows: Extirpated – 1; Endangered – 14; Threatened – 10; Special Concern – 14. Four species were assessed as Not at Risk and 5 were examined and found to be Data Deficient. Following the assessment of the Purple Spikerush (*Eleocharis atropurpurea*), new information was presented to COSEWIC which indicated that the plants at the single locality at Osoyoos Lake had been incorrectly identified. These plants are reported to be the Bent Spike-rush (*E. geniculata*), a species very similar in appearance to the Purple Spikerush. COSEWIC requests that the status assessment of the Purple Spikerush be withdrawn from further action under SARA (please see Section 3).

With respect to Species Assessments returned to COSEWIC by the Governor-in-Council (GIC), given the delays that referrals confer upon the legal listing process, COSEWIC reiterates its recommendation that species referrals be accompanied by new information likely to lead to a change in species status. Ideally, questions of clarification concerning status reports should be directed to COSEWIC before the Minister of the Environment's listing recommendations to the GIC are published in Canada Gazette Part 1 (please see Section 4).

Regarding an Ecosystem Approach to Species Assessment, COSEWIC thanks the Minister for his encouragement of its initiatives (letter to COSEWIC dated 15 June 2007). COSEWIC requests that CESCC, or the Canadian Wildlife Directors Committee, provide COSEWIC with very explicit objectives and anticipated outcomes associated with the adoption of an Ecosystem Approach to species assessment, as opposed to species-at-risk management in general. Fulfilment of this request would increase the probability that COSEWIC's inclusion of an ecosystem approach meets the expectations of CESCC in this regard (please see Section 6).

COSEWIC has initiated or approved the continuation of work being undertaken by several working groups (please see Section 8).

Item II – COSEWIC Membership (for approval)

For approval are the names of individuals who have been nominated for membership on COSEWIC by jurisdictions, by the ATK Subcommittee and by COSEWIC. COSEWIC notes that on the date that this annual report was presented to the Minister of the Environment, many COSEWIC members from jurisdictions were still awaiting their letter of appointment for a term beginning June 5, 2007, and ending December 31, 2010.

Item III – Aboriginal Traditional Knowledge Subcommittee (ATK SC) Membership

In March 2006, COSEWIC submitted to the Minister of the Environment the names of 10 nominees for membership to the ATK SC. In April 2007, 9 of COSEWIC's 10 nominees were appointed to the ATK SC. COSEWIC expresses concern that the appointment of a member who was not nominated by COSEWIC may negatively affect the trust and goodwill that has been forged between COSEWIC, Environment Canada and aboriginal organizations with regard to ATK and its inclusion in species status assessments.

Item IV – COSEWIC Terms of Reference

For approval is the recommendation that the Plants & Lichens Specialist Subcommittee be split into two subcommittees: the Vascular Plants Specialist Subcommittee and the Mosses and Lichens Specialist Subcommittee. Upon approval, this would require a revision to the current Terms of Reference of COSEWIC.

ITEM V – COSEWIC Operations and Procedures

Please note the following changes in Operations & Procedures for information and approval:

For information:

COSEWIC communicates the results of each species assessment meeting to the National Aboriginal Council on Species at Risk in addition to the Canadian Wildlife Directors Committee, the Wildlife Management Boards, and CESSC.

For approval:

- New Guidelines for processing Species Referrals by Governor in Council to COSEWIC;
- COSEWIC procedure stemming from SARA definition and policy on range edge (or peripheral) species;
- Changes to COSEWIC Assessment Process, Categories and Guidelines.

ITEM VI – COSEWIC Communications Plan

Following a request by the Canadian Wildlife Directors Committee to work on developing an outreach strategy to explain COSEWIC to Canadians, a summary of presentations given by the Chair of COSEWIC is provided.

Item VII – Species Status Assignments

A list of species assessed since the last reporting is included, indicating status assigned, reasons for designation (including uncertainties, if applicable), and COSEWIC criteria with alphanumeric codes.

I wish to express my sincere appreciation for the support of your ministry to COSEWIC and to the conservation and protection of species at risk in Canada.

Yours sincerely,

A handwritten signature in black ink, appearing to read "Jeffrey A. Hutchings". The signature is fluid and cursive, with the first name "Jeffrey" being the most prominent.

Jeffrey A. Hutchings
Chair of COSEWIC

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ITEM I - COSEWIC ACTIVITIES

1. Species Assessment Meetings

Autumn, 2006

Date: November 22-24, 2006

Location: Gatineau, Quebec

Attendance:

Members - 39 members/alternates

Secretariat Staff – 9

Observers – 13 (1 from Canadian Wildlife Federation, 1 from World Wildlife Fund Canada, 1 from Nature Canada, 1 from the Canadian Wildlife Service, 1 from the Government of Nunavut, 1 from the David Suzuki Foundation and 3 undergraduate students from the Biology Department of McGill University; 4 new COSEWIC members whose ministerial appointments took effect subsequent to the meeting on January 1, 2007).

Spring, 2007

Date: April 23-27, 2007

Location: Duchesnay, Quebec

Hosted by the Province of Quebec

Attendance:

Members - 45 members/alternates

Secretariat Staff – 10

Additional Support - 3 (Federal Government Services who provided simultaneous translation during species assessment deliberations)

Observers – 18 (1 from World Wildlife Fund Canada, 1 from the Canadian Wildlife Federation, 2 from the Canadian Wildlife Service, 3 from Fisheries & Oceans Canada, 2 from Parks Canada, 1 from the Canadian Museum of Nature, 1 from the COSEWIC Aboriginal Traditional Knowledge (ATK) Subcommittee, 1 from the Government of Nunavut, 3 from the Province of Quebec, 1 from the Province of Newfoundland & Labrador, 1 from the University of Guelph and 1 from the Quebec Association for the Rehabilitation of Birds of Prey).

Teleconferences:

Following each of the above-noted COSEWIC Species Assessment Meetings, the Chair of COSEWIC chaired a teleconference with the Canadian Wildlife Directors Committee (CWDC), followed by another teleconference with representatives of the Wildlife Management Boards (WMBs) and members of the National Aboriginal Council on Species at Risk (NACOSAR). Documents detailing the species assessments resulting from the COSEWIC Species Assessment Meetings were provided in advance of these teleconferences.

2. Summary of the Species Assessment Meetings

In November 2006, COSEWIC assessed/reassessed the status of 16 wildlife species (species, subspecies and populations) based on seven Status Reports, one of which was an unsolicited report.

The species assessment results include the following:

Endangered: Lake Sturgeon, Winnipeg River - English River populations, Nelson River populations, Saskatchewan River populations, Western Hudson Bay populations and Red-Assiniboine Rivers - Lake Winnipeg populations; Misty Lake Lentic Stickleback; Misty Lake Lotic Stickleback; Nugget Moss.

Threatened: Lake Sturgeon, Great Lakes - Upper St. Lawrence populations; Westslope Cutthroat Trout, Alberta population.

Special Concern: Sowerby's Beaked Whale; Lake Sturgeon, Lake of the Woods - Rainy River populations and Southern Hudson Bay - James Bay populations; Westslope Cutthroat Trout, British Columbia population.

In addition, two species were reassessed as Not at Risk: the Scouler's Corydalis (see point 3 under Important Notes Regarding Status Assessment) and Greenside Darter).

In April 2007, COSEWIC assessed/reassessed the status of 48 wildlife species (species, subspecies and populations) based on 39 Status Reports, of which one was unsolicited.

The species assessment results include the following:

Extirpated: Pygmy Short-horned Lizard

Endangered: Western Harvest Mouse *dychei* subspecies; Prothonotary Warbler; Red Knot *rufa* subspecies; Gray Ratsnake, Carolinian population; Five-lined Skink, Carolinian population; Greater Short-horned Lizard; Allegheny Mountain Dusky Salamander, Carolinian population; Basking Shark, Pacific population; Nooksack Dace; Redside Dace; Eastern Pondmussel; Eastern Flowering Dogwood; Ogden's Pondweed; Purple Spikerush (see point 3 under Important Notes Regarding Status Assessments).

Threatened: American Marten, Newfoundland population; Chimney Swift; Common Nighthawk; Red Knot *roseaari* type; Red-headed Woodpecker; Ross's Gull; Gray Ratsnake, Great Lakes/St. Lawrence population; Allegheny Mountain Dusky Salamander, Great Lakes/St. Lawrence population; Great Basin Spadefoot; Blunt-lobed Woodsia.

Special Concern: Sea Otter; Western Harvest Mouse *megalotis* subspecies; Black-footed Albatross; Peregrine Falcon *anatum/tundrius*; Peregrine Falcon *pealei* subspecies; Red Knot *islandica* subspecies; Five-lined Skink, Great Lakes/St. Lawrence population; Bluntnose Sixgill Shark; Longspine Thornyhead; Northern Brook Lamprey, Great Lakes -Upper St. Lawrence populations; Rougheye Rockfish type I; Rougheye Rockfish type II; Roughhead Grenadier; Tope.

In addition, four species were assessed as Not at Risk (Big Skate, Longnose Skate, Sandpaper Skate and Parker's Pipewort) and five were examined and found to be Data Deficient (Bearded Seal, previously assessed as Not at Risk; Black Buffalo; Blackfin Cisco previously assessed as Threatened (see point 3 under Important Notes Regarding Assessments); Brown Cat Shark; and the Northern Brook Lamprey, Saskatchewan-Nelson population)

As of April 2007, the COSEWIC assessment results include 552 species in various categories, including 222 endangered species, 139 threatened species, 156 species of special concern, 22 extirpated species (no longer found in the wild in Canada but occurring elsewhere) and 13 extinct species.

See Appendix I for the COSEWIC Press Releases from the November 2006 and April 2007 Species Assessment Meetings.

3. Important Notes Regarding Status Assessments:

Lake Sturgeon (*Acipenser fulvescens*): following the previous assessment of this species, COSEWIC deferred this status reassessment in the 2006 Annual Report to CESC for the Minister's consideration for inclusion in Schedule 1 of the *Species at Risk Act* (SARA) until an update status report had been finalized. The species was later reassessed in November 2006 based on 8 designatable units, including 5 separate units for the western populations, 1 unit for the Great Lakes - Upper St. Lawrence populations, 1 unit for the Lake of the Woods - Rainy River populations and 1 unit for the Southern Hudson Bay - James Bay populations. This reassessment is included in this annual report for the Minister's consideration for inclusion in Schedule 1 of the SARA.

Westslope Cutthroat Trout (*Oncorhynchus clarkii lewisi*): following the previous assessment of this species, COSEWIC deferred this status assessment in the 2006 Annual Report to CESC for the Minister's consideration for inclusion in Schedule 1 of SARA until an update status report had been finalized. The species was later reassessed in November 2006. The status assessments for the British Columbia population and for the Alberta population were reconfirmed and are included in this year's annual report for the Minister's consideration for inclusion in Schedule 1 of SARA.

Scouler's Corydalis (*Corydalis scouleri*): This species (a vascular plant) was reassessed in November 2006 as a species no longer at risk, based on an unsolicited status report received by COSEWIC from the British Columbia Ministry of Environment. The species had been previously assessed by COSEWIC as Threatened in 2001 and is on Schedule 1 of SARA.

Purple Spikerush (*Eleocharis atropurpurea*): COSEWIC assessed Purple Spikerush (a vascular plant) as endangered at its April 2007 assessment meeting. Shortly after this assessment was made, new information came to light indicating that the plants at the single locality at Osoyoos Lake had been incorrectly identified. The plants are reported to be Bent Spike-rush (*E. geniculata*), a species very similar in appearance to Purple Spikerush and present in other localities.

Following the recommendation of the Plants and Lichens Subcommittee, COSEWIC requests that the status assessment of the Purple Spikerush be withdrawn from further action under SARA.

Peregrine Falcon (*Falco peregrinus*): Originally, the Peregrine Falcon was assessed by COSEWIC as three separate subspecies. In April 2007, the Peregrine Falcon in Canada was reassessed as two separate units: one unit is the *pealei* subspecies and the other unit is the *anatum/tundrius*. Both were assessed as Special Concern and are included in this annual report for the Minister's consideration.

Blackfin Cisco (*Coregonus nigripinnis*): This was the last species remaining on Schedule 2 of SARA. It was due for reassessment by COSEWIC before the June 5, 2007 deadline of the Extension Order in place for Schedule 2 species. During the April 2007 COSEWIC species assessment meeting, this species was placed in the Data Deficient category as there are taxonomic uncertainties to be resolved prior to any reassessment.

Emergency Assessments:

Nothing to report.

During the period covered in this report (August 31, 2006 - August 31, 2007), COSEWIC did not receive any requests for Emergency Assessment.

4. Regarding Species Assessments returned by the Governor in Council to COSEWIC for further information or consideration:

In 2006, the Canada Gazette reported the decision by the Governor in Council (GIC) to refer six aquatic species (16 April 2006) and one terrestrial species (15 August 2006) back to COSEWIC for further information or consideration, rather than to add or not add the species to Schedule 1 of SARA.

With respect to the six aquatic species, a letter was written to the Minister of the Environment on 24 May 2006 to communicate COSEWIC's initial decisions on Atlantic cod (Arctic Population), Bocaccio, Cusk, Harbour Porpoise (Northwest Atlantic Population), Lake Winnipeg Physa and Shortjaw Cisco. Rationales for these species referrals were received from the Department of Fisheries and Oceans (DFO) on 29 June 2006, more than six months after the Minister of the Environment's initial recommendation that these species be referred back to COSEWIC. These were communicated to the Marine Fishes, Freshwater Fishes, Marine Mammals, and Molluscs Specialist Subcommittees with the instruction that they consider Fisheries & Oceans Canada's (DFO's) rationales and

determine whether the rationales provided COSEWIC with new information that would likely lead to a change in species status.

In response to the August 2006 decision by GIC to refer back to COSEWIC one terrestrial species, the Verna's Flower Moth, the Arthropods Specialist Subcommittee carefully considered the reasons for the species referral, as described in the Canada Gazette and in a letter to the Chair of COSEWIC (30 October 2006) from Michele Brenning, Director General, Canadian Wildlife Service.

COSEWIC confirmed its original assessments of five species: Lake Winnipeg Physa as an Endangered species; Bocaccio, Cusk and Verna's Flower Moth as Threatened species; and Atlantic Cod (Arctic Population) as a Species of Special Concern. The original status reports for these species contain the information on which these assessments were based.

With respect to the Harbour Porpoise (Northwest Atlantic Population), COSEWIC reassessed this species as Special Concern in April 2006. It is anticipated that the Shortjaw Cisco will be reassessed at the April 2008 species assessment meeting. These two reassessments were initiated because of new information pertaining to species status obtained by the Species Specialist Subcommittees, independent of the rationales provided by DFO.

The primary reason for not reassessing Lake Winnipeg Physa, Bocaccio, Cusk, Verna's Flower Moth and the Arctic population of Atlantic Cod is that COSEWIC was not provided with new information that would likely lead to a change in the status of these species. In the absence of such information, it is unlikely that COSEWIC would reassess the status of a species at risk.

Given the delays that species referrals confer upon the legal listing process, COSEWIC reiterates the following recommendations:

- a) that species referrals be accompanied by new information likely to lead to a change in species status;
- b) that questions of clarification concerning species status reports be directed to COSEWIC before the Environment Minister's listing recommendations to GIC are published in Canada Gazette Part 1.

See Appendix II for detailed responses by COSEWIC to the rationales for these seven species referrals, sent to the former Minister of the Environment, the Honourable Rona Ambrose, on December 15, 2006, and currently posted on the COSEWIC website.

5. Species Selected for Status Report Preparation to be included in the Autumn 2007 Call for Bids

COSEWIC's process for determining species for which to commission status reports was described in the 2005 Report to CESCC. This procedure was followed again in 2006-2007. At the April 2007 COSEWIC meeting, 15 species from COSEWIC's prioritized

candidate list were chosen for status report commissioning in the Autumn of 2007, in addition to 45 species requiring update status reports. Additionally, one species that had been included in previous calls (but for which no bids were received) will be reposted.

See Appendix III for the list of species to be included in the Autumn 2007 call for bids.

Following a recommendation by COSEWIC members, and initiated with the Autumn 2006 Call for Bids for some species requiring update status reports, entitlement to reimbursement for travel expenses by status report writers for attending Recovery Team meetings is now included in status report writer's contracts where applicable.

6. Workshop – Ecosystem Approach to Species Assessment

November 21-22, 2006 a workshop organized by Environment Canada took place in Gatineau, Quebec to consider the potential utility of adopting an ecosystem-based approach applied to the assessment of species at risk. The impetus behind convening this workshop was a letter from the former Minister of Environment, the Honourable Rona Ambrose, to COSEWIC indicating that CESSC wanted COSEWIC to work toward adopting an ecosystem approach to species assessment. Most COSEWIC members were present at the workshop as well as a number of people from Environment Canada, Parks Canada and DFO.

As indicated in a letter from the chair of COSEWIC to Minister John Baird on January 11, 2007, the workshop demonstrated that there is a considerable breadth of perspectives on what is meant by an 'ecosystem approach' to species at risk management. As it pertains to species assessments, COSEWIC interprets an 'ecosystem approach' to refer to a means of undertaking assessments that groups species on the basis of shared geographical proximity, ecological interactions, threats, or some combination thereof.

COSEWIC's current practices have already contributed significantly to the adoption of an Ecosystem Approach (EA), as defined above. For example, maps showing the distribution of species assessed by COSEWIC match very closely the spatial distribution of many of Canada's ecosystems (e.g., Garry Oak Ecosystem, Sydenham River, Southern Okanagan, Native Prairie Grasslands, Carolinian Ecosystem, Scotian Shelf).

COSEWIC may be able to use an EA effectively to group species reassessments; it is exploring the logistics associated with such an approach.

Regarding new species status assessments, any modifications to existing prioritization procedures cannot compromise COSEWIC's legislated responsibilities. SARA (Section 15) makes it clear (a) that it is COSEWIC's responsibility to assess the status of each wildlife species that it considers to be at risk, (b) that COSEWIC decides when wildlife species are to be assessed, and (c) that priority is to be given to those species more likely to become extinct. Thus, the primary consideration when prioritizing new assessments is that species at the greatest apparent risk of extinction receive the highest priority, irrespective of the ecosystem they inhabit.

COSEWIC will use existing (e.g., Okanagan) and anticipated (e.g., Prairie sand dunes) historical habitat mapping projects to expand the use of an EA in species assessment. The COSEWIC Secretariat will construct a database of all species at risk and associated attributes (e.g., habitat, threats) so that future status reports can include a summary of species at risk co-occurring with the species being assessed. COSEWIC's Ecosystem Working Group (EWG) may consider developing instructions to report writers to enhance the communication of ecosystem considerations in status reports.

Further development of an EA by COSEWIC may also be facilitated by other initiatives, such as the estimation of historical changes in habitat, information about proposed or existing recovery strategy bundles, and ecosystem status reports undertaken by agencies external to COSEWIC.

COSEWIC's EWG will assess the general implications (financial, logistic, data requirements, communication demands) of further incorporating an EA into the species assessment process. However, before doing so, it would be very helpful if CESSC, or the CWDC, would provide COSEWIC with very explicit objectives and anticipated outcomes associated with the adoption of an EA to species assessment, as opposed to species at risk management in general. This information would increase the probability that COSEWIC's inclusion of an EA to species assessment meets the expectations of CESSC in this regard.

7. Annual Subcommittee Meetings:

Aboriginal Traditional Knowledge Subcommittee

The ATK Subcommittee members participated in several meetings and teleconferences to develop draft ATK process and protocol guidelines, to discuss status reports and also to plan an Elders Workshop in order to have the guidelines approved before they are implemented. As well, the development of a prioritized list of species of interest/concern for aboriginal people will be discussed at the Elders Workshop. During meetings of the Subcommittee, the draft guidelines were tabled for Elders' review and approval. A Case Study to translate the provisional update status report on the Polar Bear into Inuktitut was approved to ensure Inuit participation in the species assessment process. Local Elders participated in ATK meetings to offer guidance and provide information on local species at risk issues.

In November, 2006, some ATK Subcommittee members attended the NACOSAR Species at Risk workshop to present information on COSEWIC and the ATK Subcommittee and attended an information-sharing session on Polar Bear with Inuit participating in that workshop.

See also Item III for information related to ATK Subcommittee membership.

Species Specialist Subcommittees:

Species Specialist Subcommittee meetings take place annually in different locations in Canada or, alternatively, may be held via teleconference. During these meetings, observers are invited to attend and sometimes a public information session takes place.

Important topics of discussion during these meetings include reporting the results of recent COSEWIC Species Assessment Meetings, results of public calls for bids for the preparation of COSEWIC status reports, and results of public calls for membership. Additionally, subcommittees provide orientation to their new members, develop recommendations on species status assessment, review candidate lists of species proposed for assessment, discuss special projects and plans, and receive an update on COSEWIC Operations and Procedures.

Indicated below are the names of the COSEWIC Species Specialist Subcommittees and, where relevant, a summary of special activities, projects and plans undertaken by the subcommittee.

COSEWIC is very grateful for the important work of the Species Specialist Subcommittee members who provide their time and expertise on a volunteer basis.

Amphibians & Reptiles Specialist Subcommittee

No new projects.

Arthropods Specialist Subcommittee

A working group was struck to develop guidelines that would help to standardize arthropod status reports.

Birds Specialist Subcommittee

A first draft of a complete candidate list of bird species was prepared by the Canadian Museum of Nature. Finalization of the list, including prioritization of the species, is in progress.

Freshwater Fishes Specialist Subcommittee

A name change to the ecozone map was approved (i.e. National Freshwater Biogeographic Zones of Canada). A new map in landscape layout with provincial and territorial borders was approved. The production of background summaries for all species on the candidate list is underway and expected to be completed by the end of 2007.

Marine Fishes Specialist Subcommittee

A Working Group was struck on assessment criteria which held three teleconferences and contributed to the organization of a joint DFO-COSEWIC workshop to consider the relationship between assessment approaches based on criteria for assessing risk of extinction and approaches based on biological reference points for fisheries management.

The DFO-COSEWIC Workshop on Risk of Extinction Criteria and Biological Reference Points was held in Ottawa in March, 2007 and was attended by 25 participants from COSEWIC, including members of the Marine Fishes Specialist Subcommittee, and DFO.

The Subcommittee is continuing to work on the identification of ecozones for the Atlantic.

Marine Mammals Specialist Subcommittee

No special projects.

Molluscs Specialist Subcommittee

The Subcommittee continues to develop and document its methodologies for identifying and prioritizing candidate species. The Subcommittee is interested in developing French common names for all molluscs on the candidate list. A paper was submitted for publication and will provide a revised list of English, French and Latin names for all freshwater mussels in Canada. A glossary of terms and methodologies for sampling freshwater and terrestrial molluscs is in progress.

Plants & Lichens Specialist Subcommittee

The Subcommittee continues to develop and document its methodologies for identifying and prioritizing candidate vascular plants.

Terrestrial Mammals Specialist Subcommittee

No special projects.

8. Update on Progress of Working Groups within COSEWIC

NAME OF WORKING GROUP	SUMMARY OF PROGRESS
1. Ecosystem Approach	Workshop held (See paragraph 6, Item I above)
2. Okanagan Ecosystem Mapping Project	Work completed. Final report in preparation.
3. Sand Dunes Ecosystem	Report in preparation for November, 2007 meeting.
4. Designatable Units	Report in preparation for November, 2007 meeting.
5. FAQs	Work completed. Posted on COSEWIC public website. See Item VI.
6. Captive Bred / Hybrid Species	Report in preparation for November, 2007 meeting.
7. Instructions to Status Report Writers	Members tasked during April, 2007 meeting to ensure Instructions are revised to conform with current practices, procedures and protocols
8. Evaluation Grid for Member Selection	Members tasked during April, 2007 meeting to work on a new and improved version of the evaluation grid

NAME OF WORKING GROUP	SUMMARY OF PROGRESS
9. Criteria	Report prepared for November, 2006 meeting. Recommendations stemming from the report regarding method used to estimate Area of Occupancy were approved by COSEWIC for inclusion in the Operations & Procedures Manual.
10. SARA Parliamentary Review	Members tasked during April, 2007 meeting to formulate recommendations for the parliamentary review that pertain to COSEWIC and species assessment
11. Long-term Strategic Planning	Members tasked during April, 2007 meeting to formulate recommendations as to how COSEWIC might address its anticipated increased workload over the coming years.

ITEM II - COSEWIC MEMBERSHIP

Membership Changes:

For Information:

See **Appendix IV** for a list of current and proposed members.

For Approval:

a) Members from Jurisdictions (Provincial/Territorial/Federal)

- The Province of Manitoba has nominated for re-appointment Martin Erikson.
- DFO has nominated Cecilia Lougheed as a new member.

Curricula *vitae* for these nominees are on file with the COSEWIC Secretariat.

COSEWIC notes that at the time of submission of this report to CESSC that many proposed members from jurisdictions were awaiting their letters of appointment to COSEWIC for the period from June 5, 2007, to December 31, 2010.

b) Co-chair, Aboriginal Traditional Knowledge Subcommittee

Larry Carpenter was proposed by the ATK Subcommittee members for re-appointment to COSEWIC for a second term as co-chair of the ATK Subcommittee.

c) Co-chairs of Species Specialist Subcommittees / Non-government Science Member

New /Renewed members were selected as a result of a process that was initiated with the January 2007 public call for members.

Biosketches are herein provided for the following nominees submitted for consideration and review by CESSC and subsequent appointment by the Minister of the Environment effective January 1, 2008:

Co-chair, Freshwater Fishes Specialist Subcommittee – Dr. Eric Taylor
 Co-chair, Marine Fishes Specialist Subcommittee – Dr. Paul Bentzen
 Co-chair, Marine Mammals Specialist Subcommittee – Dr. Jane Watson
 Co-chair, Plants & Lichens Specialist Subcommittee – Dr. René Belland
 Co-chair, Terrestrial Mammals Specialist Subcommittee – Dr. Marco Festa-Bianchet

Non-government science member – Michael Bradstreet

All memberships are for a four year term (January 1, 2008 – December 31, 2011) except for Dr. Marco Festa-Bianchet. He has agreed to continue for only a one-year term (January 1, 2008 to December 31, 2008) during which time there will be another public call for membership in an effort to find a suitable replacement.

See Appendix V for biosketches of new/renewed COSEWIC members.

ITEM III - ABORIGINAL TRADITIONAL KNOWLEDGE SUBCOMMITTEE MEMBERSHIP

In April 2007, the following ATK Subcommittee members were appointed by the Minister for a term ending December 31, 2009 and a letter from the Minister of the Environment confirming these appointments was sent to the Chair of COSEWIC on May 9, 2007:

Membership

Dan Benoit
 Dean Trumbley
 Jason Harquail
 Dr. Donna Hurlburt
 Sue Chiblow
 Jeannette Armstrong
 Ron Gruben
 David Dickson
 Gabriel Nirlungayuk
 Josephine Mandamin

Henry Lickers and Larry Carpenter were appointed as co-chairs and as members of COSEWIC until December 31, 2010 and December 31, 2007, respectively. Larry Carpenter was proposed by the ATK Subcommittee for re-appointment to COSEWIC for a second term as co-chair of the ATK Subcommittee, from January 1, 2008 to December 31, 2011. (See Appendices IV & V)

COSEWIC welcomes the appointment of these members to the ATK Subcommittee.

In COSEWIC's capacity as an advisory body to the Minister and to CESSC, we are obliged to advise our concerns related to the appointment of an individual that was not among the nominees communicated to the Minister of the Environment by COSEWIC.

The precedent setting appointment may negatively affect the trust and goodwill that has been forged between COSEWIC, Environment Canada and aboriginal organizations with regard to ATK and its inclusion in COSEWIC's species status assessments. It may also influence COSEWIC's ability to fulfill its legislated responsibility to assess species at risk independent of the consequences of its assessments, as required by Section 16(6) of SARA.

ITEM IV - COSEWIC TERMS OF REFERENCE

For Approval:

Splitting of the Plants & Lichens Specialist Subcommittee and creation of one more vote within COSEWIC

Background:

In Canada, there are over 5000 recognized taxa in the vascular plants kingdom. This alone greatly exceeds all vertebrate groups combined in numbers of species. At the time of inception of COSEWIC in 1977, the purview of the Plants Subcommittee consisted of vascular plants only. In 1999, the mandate of the Plants Subcommittee expanded to include another sector of the plant kingdom, the bryophytes, which include both mosses and liverworts, as well as the lichens, which belong to a separate kingdom, the fungi. This added 3000 more species under the purview of the Plants & Lichens Subcommittee.

Each of the three groups of experts comprising the current Plants and Lichens Subcommittee – the vascular plant specialists, bryologists, and lichenologists – deal with organisms that are quite different in their structure and life histories.

Therefore -

Due to the huge responsibility of the Plants & Lichens Subcommittee and the existing division between the expertise of the two co-chairs and the species specialists for the vascular plants and the mosses and lichens within the Plants & Lichens Subcommittee and their very distinct way of dealing with these organisms and the dramatically increased workload of the Plants & Lichens Specialist Subcommittee anticipated over the coming years in order to prepare updates, new reports and to deal with unsolicited reports, particularly for vascular plants -

IT IS RECOMMENDED THAT

The Plants and Lichens Specialist Subcommittee be split into two distinct Specialist Subcommittees.

This would reflect the manner of report handling within the existing subcommittee, where, at present, one co-chair deals with vascular plants and the other co-chair deals with mosses and lichens.

The creation of two distinct subcommittees would result in the need for two additional co-chairs, one for each new subcommittee with the following titles:

Vascular Plants Specialist Subcommittee

Mosses & Lichens Specialist Subcommittee

As well, this would result in one additional vote for COSEWIC whose voting structure currently is as follows:

A total of 30 votes as identified below:

10 provinces

3 territories

4 federal agencies (Canadian Wildlife Service, Fisheries & Oceans Canada, Parks Canada and the Federal Biodiversity Information Partnership, currently chaired by the Canadian Museum of Nature)

10 Subcommittees (Aboriginal Traditional Knowledge, Amphibians & Reptiles Specialists, Arthropods Specialists, Birds Specialists, Freshwater Fishes Specialists, Marine Fishes Specialists, Marine Mammals Specialists, Molluscs Specialists, Plants & Lichens Specialists, Terrestrial Mammals Specialists)

3 non-government science members

See Appendix VI for the Revised Terms of Reference (revised with respect to the above) submitted for your approval.

ITEM V - COSEWIC OPERATIONS AND PROCEDURES

The COSEWIC Operations and Procedures Manual was updated since COSEWIC's previous report to reflect changes in COSEWIC's procedures.

Noteworthy procedural changes include the following:

- New Guidelines for processing Species referrals by the Governor in Council to COSEWIC.

See Appendix VII submitted for your approval

- A description of the assessment procedure with reference to range edge/peripheral species.

See Appendix VIII submitted for your approval

- The COSEWIC Assessment Process, Categories and Guidelines were revised again to indicate that COSEWIC includes peripheral species in its assessments. Other revisions were made to clarify the assessment process.

See Appendix IX submitted for your approval

- Communicating the results of each species assessment meeting to the National Aboriginal Council on Species at Risk in addition the Canadian Wildlife Directors Committee, the Wildlife Management Boards and CESSC.

ITEM VI - COSEWIC COMMUNICATION PLAN:

As of November 2006, COSEWIC has approved a new version of its web-based Frequently Asked Questions in a effort to better explain COSEWIC the public.

http://www.cosewic.gc.ca/eng/sct8/index_e.cfm

The November 2006 letter from the Canadian Wildlife Directors Committee (CWDC) encouraged COSEWIC to work to develop an outreach strategy to explain COSEWIC to Canadians. Subsequently, the Chair of COSEWIC has delivered a number of talks about various elements of COSEWIC. Between November 2006 and June 2007, these have included presentations made to the following:

- Bluenose Coastal Action Foundation (Lunenburg, NS; November 2006)
- Department of Fisheries and Oceans' scientists and managers (Dartmouth, NS; November 2006)
- Ecosystem Workshop, hosted by Environment Canada (Gatineau, QC; November 2006)
- Public session at Freshwater and Marine Fishes Specialist Subcommittee Meetings (Edmonton, AB; January 2007)
- Orillia Naturalists Club, Twin Lakes Conservation Club, Couchiching Conservancy, Camden Plains Naturalist Club (Orillia, ON; May 2007)
- Canadian Society for Ecology and Evolution (Toronto, ON; aided by Terrestrial Mammals SC Co-Chair Marco Festa-Bianchet and jurisdictional member for British Columbia Dave Fraser; May 2007)
- SARCEP (Species at Risk Coordination Espèces en Peril), DFO (Dartmouth, NS; May 2007)
- Canadian Wildlife Directors (Whitehorse, YK; May 2007)
- Maritime Aboriginal Peoples Council (Native Council of Nova Scotia, New Brunswick Aboriginal Peoples Council, Native Council of Prince Edward Island) (Sackville, NB; June 2007)

ITEM VII– SPECIES STATUS ASSIGNMENTS

List of Species assessed since the last reporting indicating status assigned, reasons (including uncertainties if applicable) and COSEWIC criteria with alphanumeric codes.

See Appendix X.

The status reports are available in English and French on the Public Registry at the following address: www.sararegistry.gc.ca

ITEM VIII - WILDIFE SPECIES ASSESSED BY COSEWIC SINCE ITS INCEPTION

See Appendix XI.

The Canadian Species at Risk publication (September 2007) is available on the Public Registry (<http://www.sararegistry.gc.ca>) and it includes all wildlife species assessed by COSEWIC since its inception.

APPENDIX I



COMMITTEE ON THE
STATUS OF ENDANGERED
WILDLIFE IN CANADA

COMITÉ SUR LA SITUATION
DES ESPÈCES EN PÉRIL
AU CANADA

A Living Fossil at Risk of Extinction: One Part of Canada's Decline in Biodiversity

GATINEAU, QC, November 28, 2006. One of Canada's largest freshwater fishes, the Lake Sturgeon, is at risk of extinction. This was one of the key findings of the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), which met in Gatineau, Quebec, on November 22–24, 2006.

The Lake Sturgeon, like all sturgeons, is a living fossil and retains the shark-like features of its ancestors of the Devonian Period. It is an enormous, long-lived fish with a maximum size of 185 kg and a recorded maximum age of 154 years. This species was found to be most at risk in the western parts of its range (Alberta to northwestern Ontario) where it was assessed as Endangered, and is considered to be at some level of risk throughout the remainder of its range in Canada. The Lake Sturgeon faces a variety of threats, including over-harvesting and habitat loss from the construction and operation of dams. Dams have been a significant threat to many other fish species assessed as "at risk" by COSEWIC in the past, including American Eel, White Sturgeon, and the Copper Redhorse.

Over 500 Species at Risk

Altogether, 521 species in Canada are now considered "at risk" by COSEWIC.

In addition to the Lake Sturgeon, seven other species were assessed at this meeting. Of these, native populations of the Westslope Cutthroat Trout, a popular freshwater sport fish in Western Canada, were assessed as Special Concern in British Columbia and Threatened in Alberta. The primary threat to these populations is hybridization and competition with introduced trout species, including non-native strains of Cutthroat Trout and Rainbow Trout. Loss and degradation of stream habitat throughout the range of Cutthroat Trout in Canada have also contributed to the decline.

The Misty Lake Sticklebacks, an endemic species pair found only in one small lake on Vancouver Island in British Columbia, are invaluable for the study of evolutionary processes in nature. They were assessed as Endangered due to the potential threat of illegal, accidental or deliberate release of exotic organisms that continue to be spread in freshwater ecosystems on Vancouver Island.

The Sowerby's Beaked Whale was assessed as being of Special Concern. This rarely observed Atlantic deepwater whale may be adversely affected by man-made noise generated by military sonar and seismic testing.

Among the plants, the Nugget Moss was assessed as Endangered. This globally rare moss occurs at only two locations in Canada, where it is found on steep silt banks in the southern interior of British Columbia. These banks are facing increased erosion often associated with development and road building.

COSEWIC also considered a number of aquatic species that were referred back to it through Governor in Council by Fisheries and Oceans Canada (DFO) for further consideration. After evaluating the information provided by DFO, COSEWIC reaffirmed its original assessments for the Arctic population of Atlantic Cod, Bocaccio, Cusk, and the Lake Winnipeg Physa snail.

Some good news...

There was some good news to report.

COSEWIC determined that Scouler's Corydalis, a large and showy perennial plant found only on Vancouver Island, similar in appearance to the cultivated Bleeding Heart, should be reassigned from Threatened to Not at Risk. Recent surveys indicated that the plant is much more abundant than previously thought. In addition, the Province of British Columbia has created eight new wildlife habitat areas specifically to protect this species under its Forest and Range Practices Act, thus further reducing the threats.

The Greenside Darter, a colourful, perch-like fish found in the Great Lakes area of southern Ontario, previously assessed as Special Concern, has since expanded its range into several new streams and was reassessed as Not at Risk.

About COSEWIC

COSEWIC assesses the national status of wild species, subspecies, varieties, or other important units of biological diversity, that are considered to be at risk in Canada. To do so, COSEWIC uses scientific, Aboriginal traditional and local or community knowledge provided by many experts from governments, academia and other organizations. Assessment summaries are currently available to the public on the COSEWIC website (www.cosewic.gc.ca) and will be submitted to the Federal Minister of the Environment in August 2007 for listing consideration under the Species at Risk Act (SARA). At that time, the full status reports will be publicly available on the Species at Risk Public Registry (www.sararegistry.gc.ca).

There are now 521 species in various COSEWIC risk categories, including 212 Endangered, 136 Threatened, 151 Special Concern, and 22 Extirpated Species (i.e. no longer found in the wild in Canada). In addition, 13 are Extinct and 41 are Data Deficient.

COSEWIC comprises members from each provincial and territorial government wildlife agency, four federal entities (Canadian Wildlife Service, Parks Canada Agency, Fisheries and Oceans Canada, and the Federal Biodiversity Information Partnership, chaired by the Canadian Museum of Nature), three non-government science members, and the co-chairs of the species specialist and the Aboriginal traditional knowledge subcommittees.

Definition of COSEWIC terms and risk categories:

- Wildlife Species:** A species, subspecies, variety, or geographically or genetically distinct population of animal, plant or other organism, other than a bacterium or virus, that is wild by nature and is either native to Canada or has extended its range into Canada without human intervention and has been present in Canada for at least 50 years.
- Extinct (X):** A wildlife species that no longer exists
- Extirpated (XT):** A wildlife species no longer existing in the wild in Canada, but occurring elsewhere
- Endangered (E):** A wildlife species facing imminent extirpation or extinction
- Threatened (T):** A wildlife species likely to become Endangered if limiting factors are not reversed
- Special Concern (SC):** A wildlife species that may become a Threatened or an Endangered species because of a combination of biological characteristics and identified threats
- Not at Risk (NAR):** A wildlife species that has been evaluated and found to be not at risk of extinction given the current circumstances
- Data Deficient (DD):** A category that applies when the available information is insufficient (a) to resolve a wildlife species' eligibility for assessment or (b) to permit an assessment of the wildlife species' risk of extinction.

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Further details on all species assessed, and the reasons for designations, can be found on the COSEWIC website at:

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COMMITTEE ON THE
STATUS OF ENDANGERED
WILDLIFE IN CANADA

COMITÉ SUR LA SITUATION
DES ESPÈCES EN PÉRIL
AU CANADA

Peregrine Falcon and Sea Otter No Longer Threatened with Extinction

April 27, 2007. The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) met at the Station écotouristique Duchesnay near Quebec City, Quebec, April 23-27, 2007 where the conservation status of 48 species was assessed.

Recovery Efforts Succeed

The Sea Otter was wiped out in British Columbia by the fur trade in the 1700s and 1800s. It was re-introduced in 1969, when otters were brought to the northwest coast of Vancouver Island from Alaska. Sea Otters have now re-populated a third of their historic range in British Columbia. Numbers are still small, but the population is growing and expanding.

Peregrine Falcons declined drastically in the 1950s and 1960s because of pesticide contamination that thinned their eggshells. After the pesticide DDT was banned in North America, re-introduction programs helped speed the recovery of populations in southern Canada. All three subspecies of the Peregrine Falcon in Canada were assessed and none are threatened.

“It is very satisfying to witness the successful recovery of species that were on the edge of extinction, such as the Peregrine Falcon and Sea Otter. It highlights the importance of endangered species legislation and associated recovery programs in protecting and recovering Canada’s wildlife.” said Jeff Hutchings, chair of COSEWIC.

Big Shark in Deep Trouble

Despite these successes, many species are still considered to be at risk of extinction in Canada. Species from all regions of the country from terrestrial, freshwater, and marine ecosystems are at risk of extinction.

The Pacific population of the Basking Shark, the largest fish in Canadian waters, was assessed as Endangered. Feeding on tiny plankton, it grows up to 12m in length – nearly the length of a city bus. This species is particularly susceptible to population declines because it takes up to 18 years to reach maturity and females are pregnant for up to 3.5 years, the longest of any animal. Populations on the BC coast have plummeted and only 6 individuals have been seen in BC waters since 1996. An eradication program was directed at these harmless sharks until 1970, in an attempt to protect the nets used in the commercial salmon fishery.

Bird Declines Unexplained

COSEWIC expressed alarm that aerial-feeding, insect-eating birds are disappearing. Both Common Nighthawk and the Chimney Swift were assessed as Threatened. Disturbingly, the cause of these global declines in these, and related birds, is unclear. Sharp declines over 70% in the Red Knot, a migratory shorebird, are also cause for concern – one North American population of this species was deemed Endangered.

Invasive Aliens Put Native Species at Risk

The introduced Zebra Mussel has decimated populations of the Eastern Pondmussel. This freshwater mussel, found in the Great Lakes, has undergone a massive decline. Formerly, it was estimated to occur in the billions. Only two small populations remain in Canada and these are considered Endangered.

The Eastern Flowering Dogwood, one of Canada's showiest native trees, was declared Endangered. Populations of this tree are being infected by Dogwood Anthracnose, an introduced fungus, similar to the disease that has virtually eliminated the American Chestnut.

About COSEWIC

COSEWIC assesses the national status of wild species, subspecies, varieties, or other important units of biological diversity, that are considered to be at risk in Canada. To do so, COSEWIC uses scientific, Aboriginal traditional and local or community knowledge provided by many experts from governments, academia, other organizations and individuals. Assessment summaries are currently available to the public on the COSEWIC website (www.cosewic.gc.ca) and will be submitted to the Federal Minister of the Environment in August 2007 for listing consideration under the *Species at Risk Act* (SARA). At that time, the full status reports will be publicly available on the Species at Risk Public Registry (www.sararegistry.gc.ca).

There are now [552] species in various COSEWIC risk categories, including [222] Endangered, [139] Threatened, [156] Special Concern, and 22 Extirpated Species (i.e. no longer found in the wild in Canada). In addition, 13 are Extinct and 45 are Data Deficient.

COSEWIC comprises members from each provincial and territorial government wildlife agency, four federal entities (Canadian Wildlife Service, Parks Canada Agency, Fisheries and Oceans Canada, and the Federal Biodiversity Information Partnership, chaired by the Canadian Museum of Nature), three non-government science members, and the co-chairs of the species specialist and the Aboriginal traditional knowledge subcommittees.

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Further details on all species assessed, and the reasons for designations, can be found on the COSEWIC website at: www.cosewic.gc.ca

APPENDIX II

COSEWIC's Response to the six Aquatic Species Referrals and to the Verna's Moth Flower Referral of 2006

This Appendix details the rationale, as communicated from the Department of Fisheries and Oceans (DFO) to the Chair of COSEWIC on 29 June 2006, for the six species referrals identified in the Canada Gazette on 19 April 2006. E

This Appendix details also the reasons for the referral of Verna's Flower Moth back to COSEWIC, as reported in the Canada Gazette (6 September 2006).

Each species referral begins with a section entitled **Supporting Rationale**, which provides a verbatim account of the rationale provided, and a section entitled **COSEWIC's Response**.

COSEWIC's Response to the six Aquatic Species Referrals:

Bocaccio

Supporting Rationale

Abundance & Distribution:

Re-examination of the West Coast Vancouver Island (WCVI) shrimp trawl survey index time series data since the COSEWIC status report was prepared, identified errors in the time series data used in the 2002 COSEWIC assessment (Stanley, R.D., P. Starr, and N. Olsen. Can. Research Advisory Secretariat Res. Doc. 2004/027). The difference appeared to be caused by a data input error. The difference in the index related mainly to the estimate for 1979, which was about one order of magnitude lower in the re-analysis.

Re-evaluation of the shrimp survey index time series noted that bocaccio abundances in BC waters had risen from a stable period in the late 1970's to higher levels in the early 1980's, and then declined in the late 1990's to levels similar to those observed in the 1970's. The corrected 1979 index value supports this. The presentation of the shrimp survey indices with the points connected (Figure 1, from Stanley *et al*, 2004) instead of presentation as a scatter plot with a regression line drawn through the data points (Figure 2, from COSEWIC 2002, Assessment and status report on the Bocaccio, *Sebastes paucispinis* in Canada) emphasized the structure in the time series and demonstrated that there had been a period of lower abundance prior to the 1980's.

The scatter-plot presentation used in the earlier document de-emphasized this structure in the time series. The COSEWIC status report focussed more on the decline since the 1980's and did not address the structure in the survey time series, which indicated an earlier, lower level of abundance.

Further examination of the structure of the shrimp survey indices time series portrayed the data in four steps from the mid 1970s through 2003 (Figure 3, from Stanley, R.D. and P. Starr. Can. Research Advisory Secretariat Res. Doc. 2004/098). Depending on the interpretation of the survey indices, it is plausible to argue that current biomass is anywhere

from 25% to 100% from a base level of abundance. It is not plausible to argue that the population has declined by 98% from an un-fished or “normal” state represented by the high abundance levels observed in the 1980’s given the existence of the lower levels observed in the 1970’s which was followed by the high levels of the 1980’s.

The emphasis on a decline beginning from 1980 in the status report relied on the assumption that the abundance observed in the early 1980’s represented a “beginning”, “normal” or “healthy” level of abundances. This hypothesis arises because it is the earliest data available from the NMFS survey. The WCVI shrimp survey, however, provides insight into an earlier period, which was not well developed in the initial reports on this species. The WCVI shrimp survey index time series indicates that the early 1980’s are more likely to be a period of peak abundance, given the available data spanning 28 years (1975-2003).

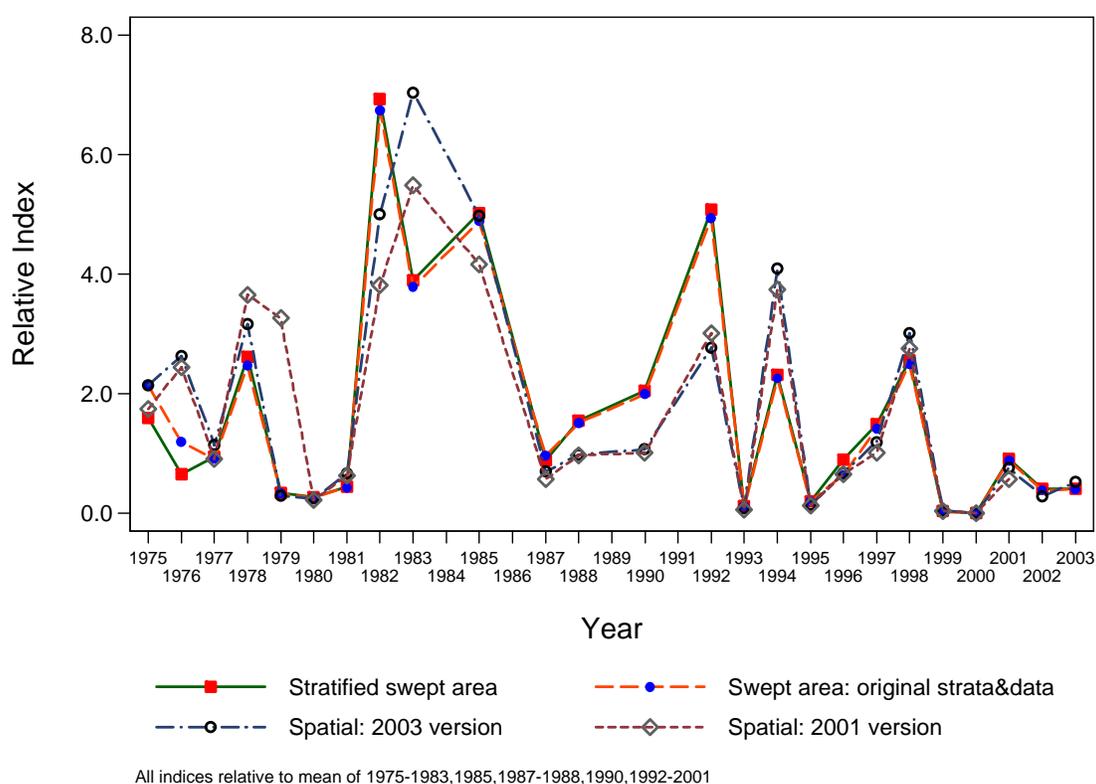


Figure 1. Comparison of a range of biomass indices using the WCVI shrimp trawl survey data: a) swept area using modified stratification; b) swept area using the original survey stratification and without dropping any tows; c) a recalculated spatial shrimp index and d) the original spatial index used in 2001 (from Stanley *et al.*, 2004).

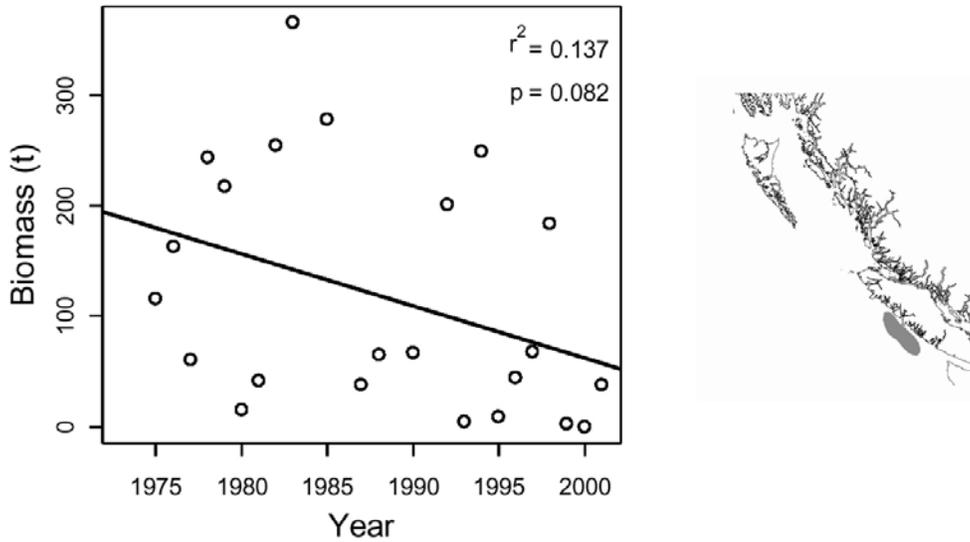


Figure 2. Bocaccio biomass estimates from the WCVI shrimp survey. The shaded region on the inset chart indicates the area that was surveyed (from Stanley, R. D., K. Rutherford, and N. Olsen Stanley 2001 Can. Research Advisory Secretariat Res. Doc. 2001/148 and COSEWIC 2002).

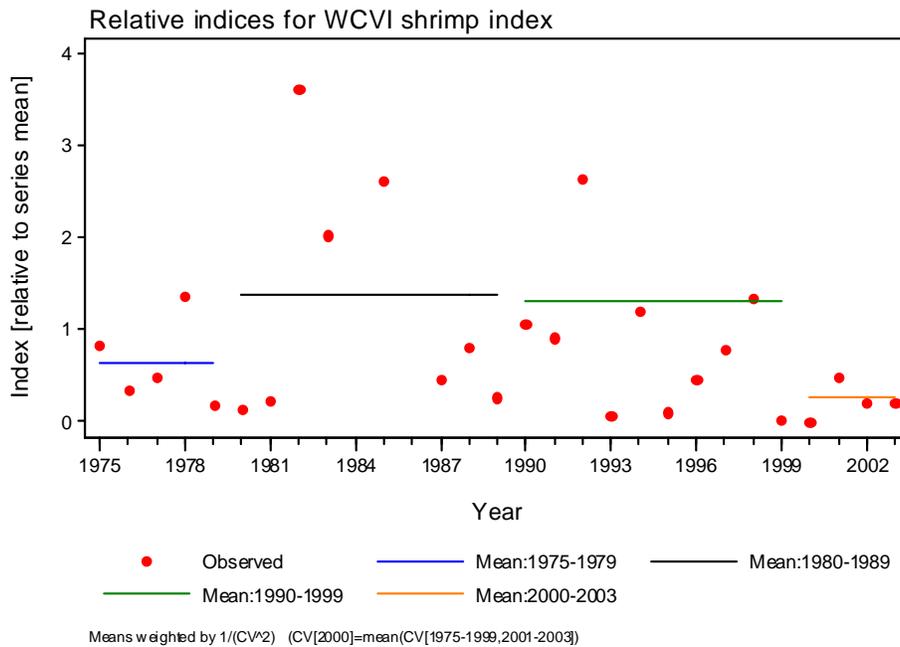


Figure 3. Four step function for the WCVI shrimp survey index, plotted relative to the mean 1975-79 survey estimates, weighted by the inverse of the CV^2 for each survey. The mean CV for the entire series (0.653) was used for the 2000 index because $CV_{2000}=0$ (from Stanley and Starr, 2004).

COSEWIC's Response

Prior to addressing government comments on the assessment, it appears appropriate to summarize the basis for COSEWIC's assessment of this species.

Several indices of abundance from surveys and commercial fisheries were available to support the COSEWIC assessment, covering varying periods of time. Biological information from fisheries and surveys was extremely limited as there has been little sampling of this relatively uncommon species over time. Most weight was given to information from a US research trawl survey that covers part of the southwestern part of Canada's Pacific continental shelf. The survey has been conducted with consistent methodology since 1980. Results from this survey showed an abundance decline of over 95% from 1980 to 2000. Although there is variability around the annual abundance estimates (typical for trawl surveys), the difference between abundance early and late in the series is statistically significant. COSEWIC also examined results from a shrimp trawl survey covering areas slightly further north on the southwestern continental shelf, covering the period 1975-2001. Variability around annual estimates was extremely high in this survey and there was no statistical difference between any of the annual estimates. Inspection of points suggested higher levels in the early 1980's than toward 2000. As indicated in the Status Report, the variability precludes inferring a decline but does not refute the decline observed in the US survey series. Bottom trawl assemblage surveys covering two areas in Hecate Strait from the early 1980's to early 2000's were also examined; although one survey showed two years of high values in the early 1980's, there was little trend otherwise. Both the latter indices (shrimp trawl survey and assemblage surveys) were given little weight relative to the US survey. Other indices were considered unreliable or covered time periods too short to be useful in assessing risk. Information on changes in distribution, size composition or other indicators that might be useful to the assessment was not available. Bocaccio in the USA, contiguous with the species in Canada, had shown serious abundance declines based on several independent abundance indices and had experienced recruitment failure in the period 1990-1998, resulting in an assessment of "critically endangered" by the IUCN Species Survival Commission.

Although the situation appeared relatively clear for the southwestern portion of the range in Canada, and was consistent with the status of the contiguous part of the distribution in the USA, there was essentially no clear information from the remainder of the range (other than some partial corroboration of a decline from one Hecate Strait survey). COSEWIC accordingly made the assumption that the available information represented the status of the species in Canada and assessed status based on the available information. Although the observed decline of over 95% would have been consistent with a status of "endangered" following COSEWIC's criteria, a status of "threatened" was assigned because the species remained widely distributed in Canadian waters and removals in the fishery (the primary identified threat) were apparently relatively low.

The "Supporting Rationale" from the federal government focuses on interpretation of the shrimp trawl series which, as noted above, was given relatively low weight in the COSEWIC assessment.

- 1) It is noted that the 1979 point in the series had been miscalculated in the COSEWIC Status Report and that the real value is an order of magnitude lower. COSEWIC considers that this change to a single point in the 28 year series would have little influence on interpretation of the series overall.
- 2) The document suggests that the shrimp trawl series shows periods of low values (late 1970's), high values (early 1980's) and low values (late 1990's), and argues that the pattern should be interpreted as an increase in abundance in the 1980's followed by a return to the 1970's abundance, rather than a decline from some "normal" value. A step function analysis which averages index values from four series of years is provided in support of this interpretation.

COSEWIC believes that, because of the high variability and the lack of statistically significant differences between points, detailed analysis of this series is not likely to be informative. The high variability is well demonstrated in Figure 5 of Stanley et al. (2004: Stanley, R. D., P. Starr and N. Olsen. 2004. Bocaccio update. Can. Sci. Advisory Secretariat Res. Doc. 2004/27) which shows the 95% confidence intervals around the individual points in the series. The step function approach is a good one and merits further consideration for assessments of this type. However, development of an objective protocol for selecting break points between steps and further examination of statistical comparison of the "levels" (for example basing analysis on a lognormal distribution) would be essential if this were to become a useful tool.

No biological or other information is provided to support the hypothesis of an increase in abundance (approximately a doubling if one takes the step function graph at face value) from the late 1970's to early 1980's. This could only result from an exceptional recruitment event occurring over a brief period between the late 1970s and early 1980s, as a result of which one would have expected to see marked changes in age or size distributions or perhaps some indication from fishermen's observations of an increase. From what is known to COSEWIC's marine fish specialists, such fluctuations in population biomass are not common for rockfishes, and this seems to be a dangerous assumption to make without additional supporting data.

Summary:

COSEWIC has considered the points raised in the "Supporting Rationale" and has reviewed the available information, and believes that there is no reason to change its assessment of "Threatened" for this species. A clear signal of serious decline is available in a relatively reliable survey index, and this is consistent with the very substantial decline in this species observed in the USA. Other indices available are given less weight but are not inconsistent with the US trawl survey index. The reliable information available covers only part of the species' distribution in Canada, so there is obviously some uncertainty regarding the overall situation. However, in the absence of complete information, COSEWIC considers that application of the precautionary approach justifies the assumption that the available information is applicable to the species in Canada.

Harbour Porpoise (Northwest Atlantic Population)

Supporting Rationale

Designatable Unit:

In the review of the status report, the appropriateness of the unit of assessment and the status were questioned. The outcome of the assessment (special concern for the entire Northwest Atlantic) was difficult to reconcile with the information provided in report. For example:

- While COSEWIC concluded that the appropriate unit of assessment for this species was at the scale of the Northwest Atlantic, their assessment summary states: “Harbour porpoise are widely distributed and can be divided into three populations that summer in the Gulf of Maine/Bay of Fundy, the Gulf of St. Lawrence, and Newfoundland-Labrador”. This suggests that there were three designatable units under consideration.
- While there is arguably sufficient data to assess one of the three purported populations (Gulf of Maine/Bay of Fundy), COSEWIC acknowledges that there is insufficient information to assess the status of the other two. The COSEWIC Status Report states that “Current knowledge is insufficient to determine the status of harbour porpoises in Newfoundland, Labrador and the Gulf of St. Lawrence; there are no estimates of total abundance or bycatch mortality from either area...”.

Abundance & Distribution:

With respect to the Gulf of Maine/Bay of Fundy population, COSEWIC reports (page 21 of the Status Report) that:

- Important conservation benefits have been derived from management measures underway;
- Current bycatch levels are less than that allowable under the *U.S. Marine Mammal Protection Act* and pose little or no threat to the future viability of this population; and
- The U.S. removed this population from the list of candidate species under their *Endangered Species Act*.

Further, COSEWIC’s assessment guidelines specify that status designations be applied to the entire species if the individual units have the same designation. The assessment for the Northwest Atlantic population of harbour porpoise as special concern seems at odds with this policy, as the COSEWIC status report indicates there is insufficient information to determine status and no estimates of abundance or mortality for two of the three sub-populations.

It should also be noted that although there is a bycatch of harbour porpoise from the Bay of Fundy herring weir fishery and the groundfish gillnet fisheries, approximately 93% of harbour porpoise captured in the Bay of Fundy herring weir fishery are released alive. Various time and area closures have been conducted in the gillnet groundfishery to, in part, minimize the level of impact on the harbour porpoise. Other bycatch mitigation measures

are being investigated and could include the use of acoustic deterrents or modified gear (i.e. barium sulfate coated nets that reflects sound waves back to the porpoises), such as that being tested by Dr. Ed Trippel (Canadian winner of the WWF Smart Gear competition). In conjunction with these efforts, bycatch monitoring has taken place.

COSEWIC's Response

Incorporating new information on bycatch and subpopulation structure, COSEWIC reassessed the Harbour Porpoise in eastern Canada at its April 2006 Species Assessment Meeting. COSEWIC reaffirmed its previous assessment of the Harbour Porpoise (Northwest Atlantic Population) as a Species of Special Concern in Canada and reconfirmed the appropriateness of assigning a single designation to the species throughout its range in Atlantic Canada. The results of this assessment were communicated to the Minister of the Environment in the 24 May 2006 letter sent by the Chair of COSEWIC and in COSEWIC's 2006 Annual Report to the Minister.

Atlantic Cod (Arctic Population)

Supporting Rationale

Aboriginal Traditional Knowledge:

During DFO's consultations in Nunavut, Aboriginal communities questioned why they were not contacted by someone from COSEWIC regarding the preparation of a status report. They did not agree with the data in the COSEWIC report. It is clear that use of Aboriginal Traditional Knowledge (ATK) was extremely limited in the assessment. Some reported that information on distribution was incorrect in the COSEWIC report. For example, numerous individuals residing on Broughton Island stated that, contrary to the COSEWIC report, there was no lake as referenced by COSEWIC. However, individuals from 3 different communities noted there were several other lakes they were aware of that contained landlocked cod but were not mentioned in the COSEWIC report meaning that the distribution of the landlocked form is greater than COSEWIC suggests. Because people in all communities stated that Inuit rarely if ever use Atlantic Cod from remote lakes, they wondered why the population was in danger.

Designatable Unit:

There was some confusion on whether the COSEWIC assessment encompassed the landlocked populations or both landlocked and marine populations; the COSEWIC assessment seems to apply to both. Little data is presented about the marine population. Consequently, the similarities of habitat and threats were questioned. Clarification is sought on the rationale for combining these groups.

Abundance & Distribution:

There was no evidence presented to support a supposed decline in the species in either or both of the marine and landlocked environments. Inuit sought information on when researchers had been to specific lakes to study this population; Inuit were unaware of such research and questioned the theory of declining populations presented in the COSEWIC

report. People in several communities reported that they knew of lakes which held landlocked populations of cod not identified in the COSEWIC report meaning that the distribution of the landlocked form has been underestimated.

COSEWIC's Response

COSEWIC responded to comments in the GIC orders returning this assessment to COSEWIC in the 24 May 2006 letter to Minister Ambrose, specifically on the collection and compilation of ATK, and on the fact that both marine and land-locked cod were included in the assessment. The response also noted the importance of differentiating Arctic cod (*Boreogadus saida*) and Atlantic cod (*Gadus morhua*) in discussions of “Arctic cod” in northern Canada. Responses to points raised in the “Supporting Rationale” are provided below.

1. The “Supporting Rationale” suggests that COSEWIC’s assessment means the population is “in danger” and is based on decline. Rather, the Special Concern category identifies species which may become Threatened or Endangered because of a combination of biological characteristics and identified threats. The COSEWIC assessment was not based on any indices of decline. The general lack of information on species status, the known sensitivity of the species to human activities, and the potential for unregulated fisheries were noted as reasons for the “Special Concern” designation. The existence of the Special Concern category in SARA and COSEWIC’s assessment protocols is an extremely important tool for identifying species that could become at risk, and, hopefully, initiating management action before further decline into the “at-risk” categories.
2. The “Supporting Rationale” provides some further unattributed observations from Aboriginal groups on distribution of cod in the Arctic. As noted in the 24 May 2006 letter to Minister Ambrose, appropriate contacts were made to obtain Aboriginal traditional knowledge for this assessment. With regard to communities that had identified additional lakes containing landlocked cod, it would be important to confirm that this refers to *G. morhua* rather than Greenland cod (*G. ogac*), a species known to inhabit coastal lakes on Baffin Island. Additional information on the species in this area would be valuable in support of improved knowledge and management action, but is unlikely to change the COSEWIC assessment given the reasons for assessment noted above.
3. The “Supporting Rationale” seeks clarification on the rationale for combining cod from marine and landlocked areas in a single unit for designation. This was essentially based on simplifying the approach to identifying designatable units for this species. As noted in the Status Report, Atlantic cod appear to be very uncommon in marine waters in this area and most of the available information is on the landlocked populations.

Summary:

COSEWIC has reviewed the government comments and the available information and sees no reason to change its designation of “Special Concern” for this population. COSEWIC strongly supports the efforts to obtain additional information on this little-known population, in particular knowledge from Aboriginal communities, and will certainly make use of this information when the species is reassessed.

Shortjaw CiscoSupporting Rationale*Aboriginal Traditional Knowledge:*

There was no incorporation of Aboriginal Traditional Knowledge in the COSEWIC status report or decision. Aboriginal communities questioned the validity of the science data that was used in the assessment.

Designatable Unit:

The COSEWIC designation is based on limited, and somewhat dated information that has been applied beyond the range of the original “type” specimens for the Great Lakes. Species taxonomy is still not reconciled particularly for specimens originating outside of the Great Lakes. The designated unit used by COSEWIC was applied to all “shortjaw cisco like” occurrences across Canada. The underlying assumption that all specimens are shortjaw cisco cannot be supported by definitive scientific information at this time including the identification of genetic markers. The COSEWIC default approach of treating Great Lakes and “inland” populations as the same species is based on the lack of evidence to the contrary but may be attributable to a deficiency of data.

Abundance & Distribution:

Identification problems may have resulted in under-reporting of the “species” from many locations where it is likely reported as cisco (*C. artedii*) or tullibee. Its status is unknown for many remote northern locations. Inclusion of recent preliminary, unsubstantiated, reports of occurrences from Great Bear Lake, NT and Lake Mistasinni QC has been questioned. There is little information on historical or current abundance of the species outside the Great Lakes.

COSEWIC's Response

Following a request from the Freshwater Fishes Species Specialist Subcommittee, COSEWIC has decided to initiate a reassessment of the Shortjaw Cisco and looks forward to receiving constructive assistance from DFO in obtaining Aboriginal Traditional Knowledge and any information that may be useful for the identification and assessment of designatable units below the species level.

Lake Winnipeg Physa

Supporting Rationale

Designatable Unit:

Concerns are related to eligibility of the “species”. The COSEWIC Assessment Process and Criteria outlines the conditions required for COSEWIC to consider a “species” for listing:

- 1) taxonomic validity (a true species in the taxonomic sense of the word);
- 2) must be native to Canada;
- 3) must regularly occur in Canada (excluding vagrants);
- 4) must require habitat in Canada (year round residents or those requiring Canadian habitat for a key life stage) and
- 5) special cases.

While it is clear that conditions 2 through 4 have been met by the Lake Winnipeg Physa, the same can not be said for condition 1 – taxonomic validity. The COSEWIC criteria state that COSEWIC will “normally only consider species and subspecies or varieties that have been established as valid in published taxonomic works or in peer-reviewed communications from taxonomic specialists”. The Lake Winnipeg physa (*Physella winnipegensis*) does not appear in the latest version of the *Code of Zoological Nomenclature* as a recognized species, subspecies or variety. Furthermore, the description of this “species” was published in a non peer-reviewed periodical, VISAYA, a publication of the commercial shell trading company Conchology Inc. Given the extremely limited number of individuals who have viewed a specimen, inherent problems in the taxonomy of the Physidae, and the lack of an examination of soft tissues or genetics in the VISAYA article, peer-review of this new species description is considered to be required.

On the basis of these two observations, it is our view that the Lake Winnipeg Physa does not meet tests required under the condition of taxonomic validity therefore that it does not meet the COSEWIC criteria for consideration. It is possible that this “species” could have been assessed under condition 5, special cases, however there is no justification provided in the status report for a special case designation.

COSEWIC does have guidelines for assessing designatable units at a level below the species level. However, it does not appear that the Lake Winnipeg Physa was assessed at a level below the true species level as no indication of this has been made in the status report. However, if the snail had been assessed using a designatable unit below the species level, COSEWIC identifies 4 conditions, any one of which could trigger a valid assessment as a designatable unit:

- 1) named subspecies or variety – published subspecies according to the *Code of Zoological Nomenclature* or
- 2) units identified as genetically distinct or
- 3) units separated by major range disjunction or
- 4) units identified as biogeographically distinct.

As outlined above the Lake Winnipeg Physa is not recognized by the *Code of Zoological Nomenclature* and has not been described in a peer-reviewed format making it ineligible under condition 1. The status report does not contain any information regarding the genetics of the Lake Winnipeg Physa or the other physa species within Lake Winnipeg leaving its genetic status ambiguous. Without this information it is impossible to determine if this “species” is genetically distinct. Without genetic analysis of this “species” it is also impossible to determine if it is a population separated by a major range disjunction or is biogeographically distinct. Consequently, until such time as the genetic analyses determine the appropriate reference population for comparison, conditions 3 and 4 can not be properly assessed. For example, if the Lake Winnipeg Physa is determined to be genetically indistinct from any of the three co-occurring physa species in Lake Winnipeg, little evidence can be provided to support the contention that it is spatially isolated or geographically distinct. If it is genetically similar to another species outside of the Lake Winnipeg drainage then it may still be eligible for listing under conditions 3 or 4. At this time it is impossible to determine if this is the case.

Abundance & Distribution:

The assessment inadequately described the threats to this “species”. The threats were hypothesized and there was a lack of clarity concerning the relationship between the general threats to Lake Winnipeg and their effects on the physa.

Total distribution and abundance within Lake Winnipeg, and perhaps nearby waters, may be underestimated although there has been extensive survey in most of the south basin. It was reported in 2004 that two areas in which the Physa had previously been found in Lake Winnipeg were now devoid of the species while one new location had been found. This new information provided by the report’s author should be included the assessment.

COSEWIC's Response

COSEWIC's identification of the Lake Winnipeg Physa as a Designatable Unit is based on the following rationale. The International Code of Zoological Nomenclature (4th edition, 1999), which outlines the rules to follow for the description of new taxa, does not require that the description of a new species appear in a peer-reviewed publication (see Articles 7-9). Nonetheless, the description of this species has been published (Pip. 2004. VISAYA II: 42-48) and the holotype deposited in the Canadian Museum of Nature. The holotype (CMNML 093695) was collected by E. Pip, 22 August 1976: length 10.7 mm, width 8.6 mm. The remaining specimens examined (spanning 43 years of collection) are in the E. Pip's collection and will be given in due time to the Canadian Museum of Nature. The Type Locality is Victoria Beach, Lake Winnipeg, Manitoba, Canada (N 5 degrees, 42', W 96 degrees 34').

The Mollusc Species Specialist Subcommittee is unanimous in its opinion that this is a distinct species and not a ‘variant’ of another species. The language of the Species at Risk Act is clear in what constitutes a Designatable Unit, as stated in Section 2 of the Act: “‘wildlife species’ means a species, subspecies, variety or geographically or genetically distinct population of animal, plant or other organism, other than a bacterium or virus, that is wild by nature”. COSEWIC affirms its conclusion that the Lake Winnipeg Physa (*Physella winnipegensis*) is a Wildlife Species and reaffirms its status as an Endangered species.

Regarding threats to this wildlife species, the Status Report makes it clear that the shoreline habitats where the Lake Winnipeg Physa (LWP) occurs have undergone significant alterations attributable to increased recreational use. The report also indicates that this deterioration in habitat quality can be attributable to a number of factors, but that the relative contribution of each factor to the persistence of the LWP is not known. The Status Report concludes that the limiting factors and threats to this species are those that affect the quality and quantity of the shallow, nearshore habitat where the species is located and those factors that affect lake eutrophication.

The rationale notes that sampling undertaken in 2004 was unable to locate the Physa in two areas where it had previously been reported and that one new location had been documented. COSEWIC looks forward to receiving this new information and will ensure that it is included when an update status report on the species is written.

Cusk

Supporting Rationale

Abundance & Distribution:

DFO Science concluded that the Halibut and 4VsW sentinel surveys (as opposed to the DFO bottom trawl survey) were a more appropriate information-source to estimate the abundance and survey trend for cusk. Cusk is considered common and widespread in commercial catches and industry longline surveys; abundance, as observed by the Halibut and 4VsW sentinel surveys, has fluctuated without trend since 1998 & 1995 respectively.

The main concerns with the DFO survey relate to the low catchability of cusk by the trawl gear and the lack of sampling in deeper waters. Cusk predominantly live in rough and rocky bottom, often hiding in crevices, areas intentionally avoided by the DFO survey even though these can be areas of cusk abundance (e.g., between Browns and German Banks where commercial landings of cusk are high). The areas sampled by the DFO survey may be considered marginal habitat for cusk. As cusk abundance declines, it is possible that these areas are relatively less occupied by cusk, implying a decline in the survey catchability for this species. This would lead to an exaggerated perspective of resource decline by the DFO survey. In addition to low catchability, the DFO survey samples only part of cusk's distribution, concentrating on the trawlable bottom and depths less than 150 m. The catch distribution of the Halibut Industry survey demonstrates that cusk occur in deeper waters. As stated above, the Halibut survey is considered a more appropriate indicator of abundance trends. Delaying the reassessment until after 2007/08 would allow consideration of 10 years of Halibut survey information in the assessment of status.

Studies are currently underway to both better document bycatch levels of cusk in invertebrate fisheries as well as their survival rates after being returned to the ocean. These studies will assist in the overall evaluation of the impacts of the fishery on cusk.

Aging studies will provide essential information on the species' growth characteristics. Studies are also underway to generate information on the sex and size composition of the population, maturity schedules, and spawning locations. These studies will lead to better estimates of the number of mature animals in the population. COSEWIC stated that in 2001, mature numbers were 314,250 which compares to an estimate of 1,033,280 individuals (500,000 + greater than 51 cm) landed in the commercial fishery, as calculated from landings and sampling information. Consequently, the total mature population abundance would have been significantly greater than that in the 2003 COSEWIC assessment.

COSEWIC's Response

The following response addresses specific points raised in the "Supporting rationale" that accompanied the referral of cusk back to COSEWIC.

1. *Halibut and 4VsW sentinel surveys are a more appropriate information source than the DFO bottom trawl survey.* These surveys may indeed cover cusk habitat (bottom type and depth) better than the trawl and probably have higher catchability. COSEWIC agrees that information from well-designed longline surveys over an appropriate period of time would be very valuable in increasing our knowledge of cusk status. However, the key weakness of the two longline surveys is their short time frame. Information from these surveys is only available from the mid to late 1990's, after the large decline in abundance observed in trawl surveys had taken place. Trawl and longline surveys are consistent in showing stable CPUE from the mid 1990's on. Commercial longline CPUE declined between 1998 and 2001 to a lesser extent but with a similar pattern to the trawl survey CPUE, which at least suggests that trawl and longline CPUEs may act in similar fashion for this species; however the commercial longline CPUE was given lower weight in the COSEWIC assessment because values for earlier values could have been affected by misidentification of cusk.
2. "...as cusk abundance declines, it is possible that these areas are relatively less occupied by cusk" ("these areas" referring to smooth bottom areas sampled by the trawl survey). The "supporting rationale" provides no evidence for a possible decline in catchability of the survey trawl with declining abundance, and we are unaware of this being a significant factor in assessments for other species. This statement seems speculative in the absence of supporting information.

While it is possible that the relative abundance trend from the trawl survey may be biased by density-dependent habitat selection, there is no evidence available to confirm that habitat selection by cusk is indeed density-dependent or to determine the extent of any bias in the trawl-survey trend. A 90% decline in survey catch rates indicates a substantial decline in cusk abundance even if habitat selection is density-dependent and optimal habitat is untrawlable. In the absence of any evidence on the existence and extent of the hypothesized bias in the survey trends, a precautionary approach would favour interpreting the 90% decline in survey catch rates as an indication of a very serious decline in cusk abundance.

3. *“..the DFO survey samples only part of cusk’s distribution, concentrating on ... depths less than 150 m”.* Figure 5 in Harris et al. (2002) shows survey coverage to depths greater than 200m. No additional information on survey depth distribution was available to COSEWIC for this assessment. COSEWIC was well aware that the trawl survey did not cover the full depth range for cusk. But, as explained in the 24 May 2006 letter from the Chair of COSEWIC to the Minister of the Environment, in the absence of information to the contrary, COSEWIC made the assumption that survey trends in the area sampled were representative of trends in the entire depth distribution.

Figure 23 in Harris et al. (2002) shows trend in non-zero catches of cusk at stations less than and greater than 150 m depth. The proportion of stations where cusk was found is greater at shallower stations throughout the time series (1970 – 2001), suggesting that cusk is generally more abundant at depths less than 150 m. Abundance in both shallow and deep stations declined in a similar pattern over this period; although a detailed analysis has not been done, inspection of the figure suggests that the decline was at least as great, and possibly greater, in deep stations than in shallow stations. In summary, this figure suggests that cusk are more commonly encountered in the depth range the “Supporting rationale” says was well-covered by the trawl than in deeper waters, and that abundance declined in a similar fashion both in shallower and deeper areas.

4. *“Delaying the reassessment until after 2007/8 would allow consideration of 10 years of Halibut survey information...”* As noted in the 24 May 2006 letter to Minister Ambrose, a long time series (30+ years) of what is considered a valid abundance index showed an abundance decline of greater than 90%, along with substantial contraction of range and decline in mean size of individuals. Surveys based on shorter time series and using different gear, while useful in providing additional information, are unlikely to provide information that would contradict the trawl survey information.
5. *Studies underway on bycatch and survival of individuals returned to the ocean.* These studies will be very useful in better defining fishery impacts on the species and in establishing recovery strategies. However, the COSEWIC assessment was primarily based on decline in abundance.
6. *Studies on age, growth, maturation, spawning and abundance.* These studies will be very useful in providing a better understanding of the species biology, and in establishing recovery protocols, and will be incorporated in the Update Status Report when COSEWIC next assesses this species. The abundance estimate (314,250 mature individuals) was identified in the COSEWIC Status Report as a minimal estimate from the trawl survey. Given the known low catchability of cusk in the trawl surveys, COSEWIC agrees that this was obviously a substantial underestimate. However, COSEWIC's assessment of cusk was based on the estimated magnitude of population decline, not on current estimates of population abundance.

Summary:

COSEWIC has considered the points raised in government responses to its assessment of cusk, and has reviewed the available information on this species. COSEWIC affirms its original status assessment of the cusk as a Threatened species.

COSEWIC's Response to the Referral of Verna's Flower Moth

Supporting Rationale

“The assessment for the Verna's Flower Moth (*Schinia verna*) is being recommended for return to COSEWIC based on several factors including lack of data on the species distribution, abundance, range, threats and suitable habitat.” (Canada Gazette Part 2 (Vol. 140, No. 18 – September 6, 2006) ANNEX 2)

COSEWIC's Response

Lack of data on species distribution:

All of the available and actual data on the distribution of Verna's Flower Moth are presented in the status report. All 55 records of the species were obtained from prairie grassland habitats. Prairie remnants are of particular interest to biologists. They have been surveyed and collected extensively by both moth and butterfly experts. The Arthropods Specialist Subcommittee does not expect any change in distribution as a result of increased search efforts although it is possible that the number of occurrences may increase.

Lack of data on the species abundance:

Although there is no information on this moth's population size or trends, it is reasonable to infer that the population declined when a historic massive conversion of native prairies to agriculture took place. The fact that the moth has been recorded so few times since its discovery suggests that it is truly rare and occurs in low numbers. That its scarcity is real is further supported by the fact that grasslands have been relatively well surveyed by entomologists and by the lack of discovery of the moth following repeated sampling efforts over a substantial period of time. Verna's Flower Moth has been found only intermittently. Repeated visits to the single known location suggest an unpredictable and ephemeral occurrence in low numbers.

Lack of data on the species range:

All records for Verna's Flower Moth are from the Canadian prairies. Despite inventories in the US prairies, this species has not been found there and is likely a Canadian endemic. As noted above, moth specialists believe that any additional records of this species will not change its currently known range.

Lack of data on threats:

More than 75% of native prairie habitats have been lost or degraded, and over extensive areas only a fraction of a percentage of certain types of prairie remain. Because much of this habitat decline took place during the nineteenth century, the population and distribution of Verna's Flower Moth were likely already reduced by the time the species was discovered. Prairie grasslands continue to be lost or degraded, and some are under management regimes that are detrimental to prairie lepidopterans. The information suggests that only certain kinds of prairie can support this moth and much of the prairie

is so fragmented that local disappearance of a rare species due to any factor is often unlikely to be followed by recolonization.

Lack of data on suitable habitat:

Although our knowledge of the exact habitat requirements of this species is limited, the information available suggests that this moth has specific habitat requirements and some of these, such as extensive blooming *Antennaria* and floristic biodiversity to provide adult foodplants, are understood.

Summary:

The best available information on the biological status of Verna's Flower Moth indicates that the moth is genuinely very rare and has specific habitat requirements. It is extant at one small prairie grassland site, is known from very few locations, occurs intermittently in low numbers, and its habitat -- remnant prairie grasslands -- is fragmented and continues to be lost and/or degraded. These factors combined meet criterion B2ab(iii) for Threatened.

APPENDIX III

Species Selected for Status Report Preparation to be included in the Autumn 2007 Call for Bids

Part A. Species selected from COSEWIC's Candidate List (15)

Species	Occurrence
1. Barndoor Skate, <i>Raja laevis</i>	NB, NS, NL, Atlantic Ocean
2. Atlantic Salmon, <i>Salmo salar</i>	ON, QC, NB, NS, PE, NL, Atlantic Ocean
3. Hungerford's Crawling Water Beetle, <i>Brychius hungerfordi</i>	ON
4. <i>Brotherella roellii</i>	BC
5. Rusty-tinged Bumble Bee, <i>Bombus affinis</i>	ON, QC, NB
6. Cuckoo Bee, <i>Epeoloides pilosula</i>	SK, MB, ON, NS
7. Atlantic Halibut, <i>Hippoglossus hippoglossus</i>	NB, NS, NL, Atlantic Ocean
8. Chestnut-collared Longspur, <i>Calcarius ornatus</i>	AB, SK, MB
9. Dolly Varden (Northern form) <i>Salvelinus malma malma</i>	Yt, NT
10. Eulachon, <i>Thaleichthys pacificus</i>	BC, Pacific Ocean
11. Threaded Vertigo Snail, <i>Nearctula</i> sp.	BC
12. Bobolink, <i>Dolichonyx oryzivorus</i>	BC, AB, SK, MB, ON, QC, NB, NS, PE, NL
13. Rocky Mountain Sculpin (Flathead pop.) <i>Cottus</i> sp.	BC
14. Laura's Clubtail Dragonfly, <i>Stylurus laurae</i>	ON
15. <i>Degelia plumbea</i>	NB, NS, NL

Part B. Species requiring updates status reports and species which need to be reposted for commissioning (46)

Species	Last assessment
Terrestrial Mammals	
Swift Fox (<i>Vulpes velox</i>)	Endangered, 2000 based on 1998 report
Eastern Mole (<i>Scalopus aquaticus</i>)	Special Concern, 2000 based on a 1998 report
Woodland Vole (<i>Microtus pinetorum</i>)	Special Concern, 2001 based on a 1998 report

Species	Last assessment
Birds	
Cerulean Warbler (<i>Dendroica cerulean</i>)	Special Concern, 2003 based on a new report
Whooping Crane (<i>Grus Americana</i>)	Endangered, 2000 based on a new report
Eskimo Curlew (<i>Numenius borealis</i>)	Endangered, 2000 based a new report
Mountain Plover (<i>Charadrius montanus</i>)	Endangered, 2000 based on a new report
Greater Prairie-Chicken (<i>Tympananuchus cupido</i>)	Extirpated, 2000 based on a 1990 report
Loggerhead Shrike, migrans subspecies (<i>Lanius ludovicianus migrans</i>)	Endangered, 2000 based on a new report
King Rail (<i>Rallus elegans</i>)	Endangered, 2000 base on a new report
Amphibians	
Great Plains Toad (<i>Bufo cognatus</i>)	Special Concern, 2002 based on a 1999 report
Spring Salamander (<i>Gyrinophilus porphyriticus</i>)	Special Concern, 2002 based on a 1999 report
Fowler's Toad (<i>Bufo fowleri</i>)	Threatened, 2000 based on a 1999 report with an addendum
Reptiles	
Queen Snake (<i>Regina septemvittata</i>)	Threatened, 2000 based on a 1999 report
Sharp-tailed Snake (<i>Contia tenuis</i>)	Endangered, 1999 based on a 1999 report
Molluscs	
Northern Riffleshell (<i>Epioblasma torulosa rangiana</i>)	Endangered, 2000 based on a 1999 report with an addendum
Wavy-rayed Lampmussel (<i>Lampsilis fasciola</i>)	Endangered, 1999 based on a 1999 report
Rayed Bean (<i>Villosa fabalis</i>)	Endangered, 2000 based on a 1999 report
Rocky Mountain Ridged Mussel (<i>Gonidea angulata</i>)	Special Concern, 2003 based on a new report

Species	Last assessment
Vascular Plants & Lichens	
Vascular Plants	
15 vascular plants	Reports yet to be determined / and to follow COSEWIC streamlining process where applicable
Mosses	
Rigid Apple Moss (<i>Bartramia stricta</i>)	Endangered, 2000 based on a new report
Freshwater Fishes	
Aurora Trout (<i>Salvelinus fontinalis timagamiensis</i>)	Endangered, 2000 based on a new report
Atlantic Whitefish (<i>Coregonus huntsmani</i>)	Endangered, 2000 based on a new report
Pugnose Minnow (<i>Opsopoedus emiliae</i>)	Special Concern, 2000 based on a new report
Columbia Mottled Sculpin (<i>Cottus bairdii hubbsi</i>)	Special Concern, 2000 based on a new report
Gravel Chub (<i>Erimystax x-punctatus</i>)	Extirpated, 2000 based on a 1987 report
Paddlefish (<i>Polyodon spathula</i>)	Extirpated, 2000 based on a 1987 report
Bridle Shiner (<i>Notropis bifrenatus</i>)	Special Concern, 2001 based on a 1999 report.
Shorthead Sculpin (<i>Cottus confuses</i>)	Threatened, 2001 based on new report
Silver Chub (<i>Macrhybopsis storerian</i>)	Special Concern, 2001 based on a new report
Blackstripe Topminnow (<i>Fundulus notatus</i>)	Special Concern, 2001 based on a new report
Reposting following no bidders from Call of Autumn 2006 & Call of Winter 2007	
Widow Rockfish (<i>Sebastes entomelas</i>)	Pacific Ocean

APPENDIX IV

COSEWIC MEMBERSHIP

Table 1. Members and Alternates from Provinces, Territories and Federal Agencies

Names of new members provided to COSEWIC and recommended for ministerial nomination are indicated in bold and underlined where applicable.

It is recommended that members be appointed effective January 1, 2008 and continue for a four-year period ending December 31, 2011

Jurisdiction	Member	Member
Alberta	Dr. Gordon Court Provincial Wildlife Status Biologist Resource Data and Species at Risk Fish and Wildlife Division Dept. of Sustainable Resource Development Government of Alberta 7th Floor, O.S. Longman Building 6909 - 116 Street Edmonton AB T6H 4P2	Steve Brechtel Head Resource Data and Species at Risk Fish and Wildlife Division Dept. of Sustainable Resource Development Government of Alberta 7th Floor, O.S. Longman Building 6909 - 116 Street Edmonton AB T6H 4P2
British Columbia	David F. Fraser Endangered Species Specialist Biodiversity Branch Terrestrial Ecosystem Science Section Ministry of Water, Land and Air Protection Government of British Columbia P.O. Box 9338 - Station Prov Govt Victoria BC V8V 9M1	Susan Pollard Endangered Species Specialist Biodiversity Branch Aquatic Ecosystem Science Section B.C. Ministry of Water, Land and Air Protection Government of British Columbia P.O. Box 9338 - Station Prov Govt Victoria BC V8W 9M1
Manitoba	William George Watkins Wildlife and Ecosystem Protection Branch Manitoba Conservation P.O. Box 24 200 Saulteaux Crescent Winnipeg MB R3J 3W3	<u>Martin Erickson</u> Fisheries Biologist Aquatic Ecosystem Section Fisheries Branch Manitoba Water Stewardship Box 20, 200 Saulteaux Crescent Winnipeg MB R3J 3W3

Jurisdiction	Member	Member
New Brunswick	Dr. Maureen Toner Biologist Species at Risk Program Fish and Wildlife Branch Department of Natural Resources Hugh John Flemming Forestry Centre P. O. Box 6000 Fredericton NB E3B 5H1	Pascal Giasson Manager Species at Risk Program Fish and Wildlife Branch Department of Natural Resources Hugh John Flemming Forestry Centre P. O. Box 6000 Fredericton NB E3B 5H1
Newfoundland and Labrador (For all Species other than Marine Fish)	Dr. Isabelle Schmelzer Ecosystem Management Ecologist Wildlife Division Department of Environment & Conservation Government of Newfoundland and Labrador P.O. Box 2007 117 Riverside Drive Corner Brook NL A2H 7S1	Shelley Moores Senior Wildlife Biologist Wildlife Division Department of Environment & Conservation Government of Newfoundland and Labrador P.O. Box 2007 117 Riverside Drive Corner Brook NL A2H 7S1
Newfoundland and Labrador (Marine Pelagic and Demersal Fish Species)	Tom Dooley Director Sustainable Fisheries Resources & Oceans Policy Department of Fisheries and Aquaculture Government of Newfoundland and Labrador P.O. Box 8700 St. John's NL A1B 4J6	David Coffin Resource Planning Supervisor Sustainable Fisheries Resources & Oceans Policy Department of Fisheries and Aquaculture Government of Newfoundland and Labrador P.O. Box 8700 St. John's NL A1B 4J6
Northwest Territories	Dr. Suzanne Carrière Ecosystem Management Biologist Wildlife Division Department of Environment and Natural Resources Government of the Northwest Territories P.O. Box 1320 Yellowknife NT X1A 2L9	Tom Lakusta Manager, Forest Resources Forest Management Department of Environment and Natural Resources Government of the Northwest Territories PO Box 1320 Yellowknife NT X1A 2L9

Jurisdiction	Member	Member
Nova Scotia	Dr. J. Sherman Boates Manager Biodiversity Department of Natural Resources Government of Nova Scotia 136 Exhibition Street Kentville NS B4N 4E5	Mark F. Elderkin Species at Risk Biologist Nova Scotia Dept. of Natural Resources Government of Nova Scotia 136 Exhibition Street Kentville NS B4N 4E5
Nunavut Territory	Chris Hotson Senior Legislation and Management Biologist Department of Environment Government of Nunavut PO Box 209 Iglulik NU X0A 0L0	Vacant
Ontario	Alan Dextrase Senior Species at Risk Biologist Biodiversity Section Fish & Wildlife Branch Natural Resource Management Division Ontario Ministry of Natural Resources P.O. Box 7000 Peterborough ON K9J 8M5	Michael Oldham Botanist/Herpetologist Ontario Natural Heritage Information Centre (NHIC) Ontario Ministry of Natural Resources P.O. Box 7000 Peterborough ON K9J 8M5

Jurisdiction	Member	Member
Prince Edward Island	<u>For Terrestrial Species</u> Rosemary Curley Program Manager Protected Areas and Biodiversity Conservation Forests, Fish and Wildlife Division Department of Environment, Energy and Forestry P.O. Box 2000 Charlottetown PE C1A 7N8	<u>For Marine Species</u> Barry MacPhee Manager, Marine Fisheries Fisheries & Aquaculture Division Department of Agriculture, Fisheries & Aquaculture P.O. Box 2000 Charlottetown PE C1A 7N8
	<u>For Freshwater Species</u> Rosanne MacFarlane Freshwater Fisheries Biologist Forests, Fish and Wildlife Division Department of Environment, Energy and Forestry P.O. Box 2000 Charlottetown PE C1A 7N8	
Quebec (Plants)	Jacques Labrecque Botaniste Ministère du Développement durable, de l'Environnement et des Parcs Direction du patrimoine écologique et des parcs 4e étage 675, boul. René-Lévesque Est Québec QC G1R 5V7	Vacant
Quebec (Fauna)	Daniel Banville Biologiste Ministère des Ressources naturelles et de la Faune Secteur Faune Québec 2 ^e étage 880, chemin Ste-Foy Québec QC G1S 2L4	Jacques Jutras Biologiste Ministère des Ressources naturelles et de la Faune Secteur Faune Québec 2 ^e étage 880, chemin Ste-Foy Québec QC G1S 2L4

Jurisdiction	Member	Member
Saskatchewan	Jeanette Pepper Zoologist Biodiversity Conservation Section Fish & Wildlife Branch Department of Environment Government of Saskatchewan 2 nd Floor, 3211 Albert Street Regina SK S4S 5W6	Dr. Robert Wright Forest Plant Ecologist Forest Practices and Accountability Unit Forest Service Branch Department of Environment Government of Saskatchewan 3211 Albert Street Regina SK S7N 5W6
Yukon Territory	Thomas Jung Senior Biologist Fish and Wildlife Branch Department of Environment Government of Yukon P.O. Box 2703 Whitehorse YT Y1A 2C6	Syd Cannings NatureServe Yukon Yukon Department of the Environment Box 2703 Whitehorse YT Y1A 2C6
Federal Biodiversity Information Partnership (Canadian Museum of Nature)	Dr. Lynn Gillespie Research Scientist Canadian Museum of Nature P.O. Box 3443 - Station D Ottawa ON K1P 6P4	Jennifer Doubt Chief Collection Manager - Botany Canadian Museum of Nature P.O. Box 3443 - Station D Ottawa ON K1P 6P4
Environment Canada (Canadian Wildlife Service)	Dr. Theresa Fowler Science Advisor / Species Assessment Biologist Population Conservation & Management Division Canadian Wildlife Service Environment Canada Ottawa ON K1A 0H3	Alain Branchaud (December 2010) Species at Risk Biologist Centre Saint-Laurent Environment Canada 105 McGill Street Montreal QC H2Y 2E7
Department of Fisheries and Oceans	Dr. Jake Rice Director Canadian Science Advisory Secretariat Department of Fisheries and Oceans 200 Kent Street - Station 8W129 Ottawa ON K1A 0E6	Lara Cooper, M.Sc. Canadian Science Advisory Secretariat Fisheries and Oceans Canada St Andrews Biological Station 531 Brandy Cove Road St. Andrews NB E5B 2L9 <u>Cecilia Lougheed</u> Fish Population Science Ecosystem Science Fisheries and Oceans Canada 200 Kent Street Station 12S035 Ottawa ON K1A 0E6

Jurisdiction	Member	Member
Parks Canada	Dr. Gilles Seutin Coordinator Species at Risk Program Parks Canada 25 Eddy Street, 4 th Floor Gatineau QC K1A 0M5	Dr. Patrick Nantel Conservation Biologist Species at Risk Program Parks Canada 25 Eddy Street, 4th Floor Gatineau QC K1A 0M5

Table 2. Co-chairs of the Aboriginal Traditional Knowledge Subcommittee and Species Specialist Subcommittees, with dates of appointment and the ending date of their terms of office.

Names of new/renewed members recommended by COSEWIC for ministerial appointment for a term starting January 1st, 2008 are indicated in **Bold** and underlined where applicable.

Dr. Marco Festa-Bianchet is, by exception, recommended for a term of one year starting January 1, 2008 and ending **December 31, 2008**.

Subcommittee	Name	Date Appointed	Term Ending
Aboriginal Traditional Knowledge	Henry Lickers Mohawk Council of Akwesasne Department of the Environment P.O. Box 579 Cornwall ON K6H 5T3	05/06/2003	31/12/2010
	<u>Larry Carpenter</u> Wildlife Management Advisory Council - Northwest Territories P.O. Box 2120 Inuvik NT X0E 0T0	05/06/2003	31/12/2011
Amphibians and Reptiles Specialist	Dr. Ronald J. Brooks Department of Zoology College of Biological Science University of Guelph Guelph ON N1G 2W1	05/06/2003	31/12/2010
	Dr. David M. Green Redpath Museum McGill University 859 Sherbrooke Street West Montréal QC H3A 2K6	05/06/2003	31/12/2008

Subcommittee	Name	Date Appointed	Term Ending
Arthropods Specialist	Dr. Laurence Packer Department of Biology York University 4700 Keele Street Toronto ON M3J 1P3	01/01/2007	31/12/2010
	Dr Paul M. Catling Research Scientist and Curator Biodiversity, National Program on Environmental Health Agriculture and Agri-food Canada, Research Branch Wm. Saunders Bldg., Central Experimental Farm Ottawa ON K1A 0C6	01/01/2005	31/12/2008
Birds Specialist	Richard Cannings 1330 East Debeck Road R.R. 1, Site 11 - Comp. 96 Naramata BC V0H 1N0	01/01/2005	31/12/2008
	Dr. Marty L. Leonard Department of Biology Dalhousie University 1355 Oxford Street Halifax NS B3H 4J1	05/06/2003	31/12/2010
Freshwater Fishes Specialist	Dr. Robert Campbell 983 Route 800 E R.R. #1 St. Albert ON K0A 3C0	05/06/2003	31/12/2009
	Dr. Claude Renaud Adjunct Professor, University of Ottawa Research Scientist – Ichthyology Canadian Museum of Nature P.O. Box 3443 – Station D Ottawa ON K1P 6P4	05/06/2003	31/12/2007
	<u>Dr. Eric B. Taylor</u> Associate Professor Department of Zoology University of British Columbia 6270 University Boulevard Vancouver BC V6T 1Z4	01/01/2008	31/12/2011

Subcommittee	Name	Date Appointed	Term Ending
Molluscs Specialist	Robert Forsyth P.O. Box 3804 Smithers BC V8T 3Y7	01/01/2007	31/12/2010
	Janice L. Smith Aquatic Ecosystem Impacts Research Branch National Water Research Institute Environment Canada Burlington ON L7R 4A6	01/01/2005	31/12/2008
Marine Fishes Specialist	Dr. Howard Powles 53 rue Lortie Gatineau QC J9H 4G6	01/01/2006	31/12/2009
	<u>Dr. Paul Bentzen</u> Professor Department of Biology, Dalhousie University Halifax NS B3H 4J1	01/01/2006	31/12/2011
Marine Mammals Specialist	Dr. Andrew Trites Director Marine Mammal Research Unit Fisheries Centre University of British Columbia 2204 Main Mall Vancouver BC V6T 1Z4	05/06/2003	31/12/2007
	<u>Dr. Jane Watson</u> Malaspina University College 900 5 th Street Nanaimo BC V9R 5S5	01/01/2008	31/12/2011
	Dr. Randall R. Reeves Okapi Wildlife Associates Hudson QC J0P 1H0	01/01/2005	31/12/2008
Plants and Lichens (Vascular Plants)	Dr. Erich Haber c/o National Botanical Services 604 Wavell Avenue Ottawa ON K2A 3A8	05/06/2003	31/12/2009
Plants and Lichens (Mosses and Lichens)	<u>Dr. René Belland</u> Devonian Botanic Garden University of Alberta Edmonton AB T6G 2E1	05/06/2003	31/12/2011

Subcommittee	Name	Date Appointed	Term Ending
Terrestrial Mammals	<u>Dr. Marco Festa-Bianchet</u> Department of Biology Sherbrooke University Sherbrooke, QC J1K 2R1	05/06/2003	31/12/2008
	Dr. Mark Brigham Department of Biology University of Regina Regina, SK S4S 0A2	01/01/2006	31/12/2009

Table 3. COSEWIC Non-government Science Members with dates of appointment and the ending date of their terms of office.

Names of new/renewed members recommended by COSEWIC for ministerial appointment for a term starting January 1, 2008 are indicated in **Bold** and **underlined** where applicable.

Name	Date Appointed	Term Ending
<u>Michael Bradstreet</u> Nature Conservancy of Canada Ontario Administrative Centre 115 Front Street P.O. Box 520 Port Rowan ON N0E 1M0.	05/06/2003	31/12/2011
Dr. Jeannette Whitton Associate Professor and Director, UBC Herbarium Department of Botany University of British Columbia 3529-6270 University Boulevard Vancouver BC V6T 1Z4	01/01/2007	31/12/2010
Dr. Jeffrey Hutchings Department of Biology Dalhousie University 1355 Oxford Street Edsell Castle Circle Halifax NS B3H 4J1	01/01/2005	31/12/2008

APPENDIX V

Biosketches of new/renewed COSEWIC members

Co-chair, Terrestrial Mammals Specialist Subcommittee

Re – appointment for one year term (January 1 – December 31, 2008)

Dr. Marco Festa-Bianchet

After receiving a Ph.D. from the University of Calgary in 1987, Dr. Festa-Bianchet was a postdoc at the Large Animal Research Group of the University of Cambridge and then joined the Université de Sherbrooke in 1990. He has been a Professeur titulaire (Full Professor) since 1999. He has supervised 27 graduate students and postdocs and is currently supervising seven. He has published over 100 refereed papers, mostly on mammals. Dr. Festa-Bianchet's research program currently includes projects on bighorn sheep in Alberta and British Columbia, mountain goats in Alberta, ibex in Italy and France. He also supervises students working on huemul deer in Patagonia and meerkats in Africa. In the past, Dr. Festa-Bianchet has worked with wolves in Québec, ground squirrels in Alberta and fallow deer in Italy (see <http://pages.usherbrooke.ca/mfesta/marco.htm>).

Dr. Festa-Bianchet has been a member of the Terrestrial Mammals Specialist Subcommittee since 1996, and co-chair since 1998. He was Chair of COSEWIC from 2002 to 2006.

Dr. Festa-Bianchet has chaired the Caprinae Specialist Group of the IUCN since 2001. He has been an Associate Editor of *Wildlife Biology* since 2001 and of *Behavioral Ecology and Sociobiology* since 2004. Although his career has been mostly in academia, he also worked for the Alberta Government in 1981-1983. Having worked in different parts of the country, Dr. Festa-Bianchet has a good understanding of the Canadian wildlife management and conservation community.

Co-chair, Freshwater Fishes Specialist Subcommittee

Dr. Eric B. Taylor

Dr. Taylor received a Ph.D. from the University of British Columbia (UBC) in 1989 and is currently a full Professor at UBC in Vancouver where he is Curator of the UBC Fish Museum and Associate Director of the Biodiversity Research Centre. His research has focussed on the conservation and genetics of western freshwater and marine fishes. Dr. Taylor has published over 80 papers in the primary literature including several papers on listed Canadian fishes.

Dr. Taylor has considerable knowledge and experience with respect to the biology and conservation of Canadian marine, anadromous and freshwater fishes. He is most knowledgeable regarding western and northwestern Canadian marine and freshwater environments. Dr. Taylor has been a member of the COSEWIC Freshwater Fishes Specialist Subcommittee since 2001. This has given him a good background in the COSEWIC species assessment process and in formulating recommendations with respect to biological status. Dr. Taylor also authored the original COSEWIC status report on Lake Utopia smelt populations and prepared the Designatable Unit Key that has been considered by COSEWIC. He is also a member of the American Fisheries Society's Endangered Species Committee and is an Associate Editor or on the Editorial Review Board of several journals.

Co-chair, Marine Fishes Specialist Subcommittee

Dr. Paul Bentzen

Dr. Bentzen's professional experience has been primarily in the university environment, first as Assistant and Associate Professor in the School of Aquatic and Fishery Sciences at the University of Washington (Seattle), and now as full Professor in the Department of Biology at Dalhousie University. Since July 2001, he has held the Fisheries and Oceans Canada (DFO) Chair in Fisheries Resource Conservation Genetics, which was created by DFO and Dalhousie University to foster genetic research on fisheries and conservation related issues and to increase the amount of fisheries genetics expertise in the region. Although the position involves no obligations to DFO other than the expectation that he will be active in research, the position provides Dr. Bentzen with the opportunity for extensive interaction and collaboration with DFO colleagues.

Dr. Bentzen's research encompasses population, evolutionary and conservation genetics and biology of marine fishes and other aquatic organisms. His population studies have included many species of Atlantic fishes, including Atlantic cod, Atlantic salmon, rainbow smelt, haddock, redfish, striped bass, American shad, alewife, Atlantic whitefish, herring, white hake, shorthorn sculpin, and Atlantic, northern and spotted wolffish. He has also conducted research on a variety of Pacific species including salmonids, herring, rockfishes and walleye pollock. In the broader context, he has also conducted research on sea otters, northern fur seals, geoduck clams and Dungeness crabs, and is currently collaborating on research on two species of deep-sea corals. Thus Dr. Bentzen has extensive experience with the fishes of both the Atlantic and the Pacific and he has begun to get first-hand experience of some Arctic fishes. He is generally knowledgeable about North America, including both its marine and freshwater ecosystems.

Since January 2004, Dr. Bentzen has been a member of the Marine Fishes Subcommittee, and its Co-chair since 2006. He has participated in two COSEWIC species assessment meetings and has participated in many of DFO's Atlantic species reviews for COSEWIC. He has considerable intellectual knowledge of concepts and techniques that could be applied to the assessment of the conservation status of species at risk, especially concerning the topic of Evolutionarily Significant Units. He has participated in two National Advisory Process meetings conducted by DFO to develop and review summary information on the status of marine fishes for the purpose of briefing COSEWIC.

Co-chair, Marine Mammals Specialist SubcommitteeDr. Jane Watson

Dr. Watson has a B.Sc. from the University of British Columbia and a Ph.D. from the University of California at Santa Cruz. She is currently a Professor of the Department of Biology at Malaspina University-College. Over the last 20 years, Dr. Watson has conducted research on the community ecology and population biology of sea otters. She has also been involved in population assessments of a variety of Pacific marine mammal species. Dr. Watson has a broad knowledge of the natural history and biology of the marine mammals of the Pacific coast of North America and has a strong background in the biology and taxonomy of marine macro-invertebrates, fish, birds and vegetation of the same region.

Dr. Watson has experience in assessment techniques and in formulating status recommendations. She has been a member of the COSEWIC Marine Mammal Specialist Subcommittee for six years, where she is a diligent and well-respected member. She has also served on the sea otter recovery team and the Marine Life Working Group, a committee formed by Fisheries & Oceans Canada and local non-government organizations to assess the status of marine species in the Strait of Georgia. Dr. Watson is also well versed in the concepts and techniques related to the assessment and conservation of species at risk through her own research on marine mammals.

Dr. Watson has extensive reviewing experience, including reviews of COSEWIC status reports for the Marine Mammal Specialist Subcommittee, articles for peer-reviewed journals, grant and scholarship applications and graduate student theses.

Co-chair, Plants & Lichens Specialist SubcommitteeDr. René J. Belland

Dr. Belland is Assistant Director (Research)/Data Systems Manager of the Devonian Botanic Garden at the University of Alberta in Edmonton, Alberta. He received his M.Sc. (1981) and Ph.D. (1985) in Biology from Memorial University where he studied the distribution, ecology and phytogeography of the mosses of the Gulf of St. Lawrence Region. He then spent 2 years as a post-doctoral fellow and a further 5 years as a research scientist in the Department of Botany at the University of British Columbia in Vancouver where he studied the distribution of British Columbia mosses and continued to work on the bryophyte flora of Atlantic Canada. He became a research associate in the Department of Botany at the University of Alberta in Edmonton in 1993 and has been in his current position of Assistant Director of the Devonian Botanic Garden since 1996.

Dr. Belland has over 30 years of experience as a bryologist, with expertise in the mosses of Atlantic Canada, British Columbia, Alberta and the Arctic. His research focuses on the distribution, ecology and phytogeography of bryophytes, with a particular interest in rare species. He has experience in teaching and research and is an active field botanist. He has taught courses on bryology, plant biology, and general biology/conservation, has co-supervised two Ph.D. students, and has been on the supervisory committee for eight other graduate students. His research on the distribution and ecology of the mosses and liverworts in Canada has resulted in 30 peer-reviewed articles, one book chapter and 22 reports. He is without a doubt a recognized authority on the bryophyte flora of Canada. His membership on several World Conservation Union (IUCN) committees is evidence of his influence at the international level.

Dr. Belland has extensive experience in the assessment and conservation of species at risk at the federal, provincial and international levels. He has been Co-Chair of the Plants and Lichens Specialist Subcommittee of COSEWIC since 1999. He also chairs the Endangered Species Assessment Subcommittee for the Province of Alberta, is a member of two IUCN committees (one dealing with bryophytes and the other with Arctic plants), and has been involved in recovery activities for Haller's Apple Moss in British Columbia and Alberta and Porsild's bryum in Newfoundland and Labrador. He has also worked with the provincial heritage programs of Alberta, British Columbia and Atlantic Canada, helping them to develop their tracking lists. He has authored three COSEWIC status reports and has brought 28 reports on mosses and lichens to COSEWIC for assessment. He has also developed the working moss prioritization list for Canada.

Co-chair, Aboriginal Traditional Knowledge Subcommittee

Larry Carpenter

Mr. Carpenter was raised on Banks Island in what is now part of the Inuvialuit Settlement Region. He is a hunter and guide who enjoys being out on the land.

Mr. Carpenter is serving a third term as Chair of the Wildlife Management Advisory Council (NWT), a co-management board, established under the Inuvialuit Final Agreement, responsible for the conservation of wildlife and wildlife habitat in the Inuvialuit Settlement Region.

He has served in numerous capacities on behalf of the Inuvialuit including chair of the Inuvialuit Game Council (IGC), a position he held until his resignation in late 1997.

As chair of the IGC, his portfolios included the official signing ceremony establishing Tuktu Nogait National Park, Convention on International Trade of Endangered Species and North Atlantic Marine Mammal Commission.

Mr. Carpenter has taken on these responsibilities willingly with the understanding that he would be away from his family and the land which he enjoys so much to help implement and manage the Inuvialuit land claim.

He has many achievements to his credit which include establishing discussions between the Inupiaq of Alaska and the Inuvialuit in the development of an international beluga whale agreement. This has led to the formation of the Inupiat/Inuvialuit Beluga Whale Commission. He presently serves on the Polar Bear Technical Committee.

Mr. Carpenter has represented the Inuvialuit regionally, nationally and internationally at numerous gatherings, and he has presented papers on wildlife management in Canada and elsewhere.

He is currently co-chair of the Aboriginal Traditional Knowledge Subcommittee of the Committee on the Status of Wildlife Endangered in Canada (COSEWIC) and sits as a member of COSEWIC.

Mr. Carpenter is also a member of the National Aboriginal Council on Species at Risk.

Non-government Science Member

Michael Bradstreet

Mr. Bradstreet is a biologist employed by the Nature Conservancy of Canada. His biology degree is from the University of Toronto. He has field experience conducting research for 14 years in the Canadian Arctic on seabirds, fish and marine mammals. He has extensive experience in recovery programs for songbirds in southern Ontario. He has published twenty papers in primary journals. From 1989 to 2004 he was the president of Bird Studies Canada. He currently is the Vice President of Conservation for the Nature Conservancy of Canada. He has worked in every province and territory in Canada, and has a very good knowledge of Canadian species and ecosystems.

Mr. Bradstreet has been a voting member of COSEWIC since 2001. He has chaired COSEWIC's Operations & Procedures Subcommittee for the past three years. He has clearly demonstrated his ability to work in a consensus based organization and clearly understands the value of a clear and well documented process.

APPENDIX VI

Terms of Reference Committee on the Status of Endangered Wildlife in Canada (COSEWIC)

Last approved by CESSC in September 2003
Revised (April 2007)

Submitted for approval by CESSC
(revisions are indicated in **bold and underlined** in the text)

Role:

To assess the conservation status of species that may be at risk in Canada, to report the results of its assessments, including their reasons and uncertainties, to the Canadian Endangered Species Conservation Council (CESSC) and to the Canadian public. COSEWIC uses the best available scientific, Aboriginal and community knowledge to assess species. The assessment process is independent and transparent.

Context:

On behalf of the CESSC, the Canadian Wildlife Directors Committee provides general direction to COSEWIC on matters of organization and procedures, such as membership, structure and criteria. Within this framework, COSEWIC's assessments are carried out and reported in an independent and transparent manner. To determine candidate species for assessment, COSEWIC uses, among other sources of information, the evaluations provided by the National General Status Working Group. COSEWIC documentation is provided to the National Recovery Working Group as a starting point for recovery planning.

Structure and Composition:

COSEWIC includes scientific experts in conservation biology, ecology, taxonomy, wildlife management, stock assessment, population biology, Aboriginal or community knowledge, and related fields. It is composed of experts from each of the provinces and territories (1 each for a total of 13), one from each of four federal agencies/departments (Canadian Wildlife Service, Department of Fisheries and Oceans, Parks Canada, and the Museum of Nature on behalf of the **Federal Biodiversity Information Partnership**¹), their alternates, the Co-Chairs of the Species Specialist Subcommittees, the Co-Chairs of the Aboriginal Traditional Knowledge Subcommittee, and three Non-government scientific experts. All members are appointed under federal legislation to four-year, renewable terms. Details of member selection are provided in Annex 1. The Chair of COSEWIC is a two-year appointment elected by COSEWIC from among its members by secret ballot.

Species Specialist Subcommittees – Species Specialist Subcommittees (SSCs, Annex 2) include two Co-Chairs and a minimum of five members. They develop status reports for COSEWIC assessments. The need for new Species Specialist Subcommittees is assessed by COSEWIC in consultation with CESSC.

¹ The Federal Biosystematics Partnership changed its name in 2004;

Aboriginal Traditional Knowledge Subcommittee - The Aboriginal Traditional Knowledge Subcommittee facilitates the incorporation of Aboriginal traditional knowledge into the COSEWIC status assessment process. It is led by two Co-Chairs, selected by the Subcommittee from among its members.

Co-Chairs Subcommittee - The COSEWIC Co-Chairs Subcommittee includes the Co-Chairs of the Species Specialist and Aboriginal Traditional Knowledge Subcommittees, and is chaired by the chair of COSEWIC. It deals with technical aspects of the work of the SSCs and provides advice on such matters to COSEWIC.

Emergency Assessment Subcommittee - The Chair of COSEWIC may set up an Emergency Assessment Subcommittee to deal specifically with a request for Emergency Assessment. An Emergency Assessment Subcommittee includes the Chair of COSEWIC, COSEWIC members from the species' range jurisdictions, the Co-Chairs of the appropriate SSC and other COSEWIC members at the Chair's discretion. The Subcommittee assesses the available evidence and may classify the species into an appropriate risk category. As soon as possible, a report on the species will be examined by COSEWIC at a Species Assessment Meeting and the species will be re-assessed.

Operations and Procedures Subcommittee – This Subcommittee is composed of COSEWIC members and updates the COSEWIC Operations and Procedures Manual as requested by COSEWIC. All substantive changes to the Manual must be approved by COSEWIC.

Secretariat - Administration services and technical support will be provided by a Secretariat funded and staffed by the Canadian Wildlife Service.

Mode of Operation:

Assessments are made on the basis of the best available biological information, including scientific, Aboriginal and community knowledge.

COSEWIC will be guided by the precautionary approach as set out in the Accord for the Protection of Species at Risk in Canada.

COSEWIC meets at least once a year. Quorum is two thirds of the voting membership.

COSEWIC develops its own operations and procedures, including the creation of subcommittees and working groups, recognizing its accountability to the Canadian Wildlife Directors Committee.

Assessment decisions are made on the basis of consensus whenever possible. When unanimity is not possible, decisions are based on a two-thirds majority vote.

COSEWIC provides to CESSC and to the public the complete reasons for each status assessment and identifies any uncertainties noted during the assessment.

The Chair of COSEWIC may seek advice from appropriate members on any issue of concern to COSEWIC.

Functions:

COSEWIC

To review and approve candidate and priority lists of species for assessment as submitted by the Co-Chairs Subcommittee.

To assess the status of species using accepted criteria and definitions.

To report its assessments and findings to the CESSC, and to publish its assessments and status reports.

To develop and periodically review scientific definitions, guidelines, standards and criteria to assess the status of wildlife species, to forward them to CESSC for endorsement and to publish them.

To review plans, annual reports, budgets, and activities of COSEWIC and its Subcommittees.

To establish working groups to deal with specific issues.

To provide direction to the Secretariat.

To prepare an annual report of all COSEWIC activities.

To receive unsolicited reports that have been reviewed by the appropriate SSC.

Species Specialist Subcommittees

To establish, with input from the Co-Chairs Subcommittee, priority lists of species to be assessed.

To commission status reports on eligible candidate species

To review unsolicited reports and ensure that they meet the standards of commissioned reports.

In cooperation with COSEWIC members from range jurisdictions, wildlife management boards and outside experts, to review draft status reports to ensure accuracy, completeness, quality of analysis and application of relevant listing criteria.

To recommend a status to COSEWIC.

Aboriginal Traditional Knowledge Subcommittee

[The roles and functions of the Aboriginal Traditional Knowledge Subcommittee are currently being developed.]

Co-Chairs Subcommittee

To recommend priorities for assessments within and among each taxonomic group.

To establish guidelines for the selection of competing bids for status reports, the drafting of status reports, and for the assessment of the quality and suitability of unsolicited reports

To undertake actions requested by COSEWIC.

To provide advice to COSEWIC on matters related to the work of SSCs.

Secretariat

To provide administrative services, such as organizing and servicing meetings.

To provide administrative and technical support to subcommittees.

To administer financial support for status reports.

To maintain financial records.

To maintain files, records and other archival materials.

To disseminate information to the public, including the publication of status reports in both official languages.

Responsibilities

Members

To perform their duties in an independent manner.

To attend COSEWIC meetings, including Emergency Assessment meetings as requested by the Chair.

To review draft and interim status reports and contribute to status assessment deliberations to the best of their knowledge and ability.

For jurisdictional members, to advise writers of status reports of known sources of information, suggest species for the priority list and for status reports, guide report writers to appropriate contacts within their jurisdictions, review draft and interim reports, and provide regional expertise on the status of, and threats to species within their jurisdiction.

Chair

To ensure that meetings proceed in an orderly fashion maintaining the principles of independence, transparency, and scientific integrity upon which COSEWIC is based.

To head the Co-Chairs subcommittee.

To initiate Emergency Status Assessments.

To serve as contact person and spokesperson to CESSC, news media, and the general public.

Observers

At the discretion of the Chair, observers may attend COSEWIC meetings with advance special permission if their presence assists COSEWIC in fulfilling its mandate. Observers will maintain confidentiality over the proceedings and decisions of COSEWIC.

ANNEX 1

Selection of COSEWIC membership:

Species Specialist Subcommittee Co-Chairs and Non-government scientific experts are recommended **after an open competition by COSEWIC for appointment to the Minister after consultation with the CESSC**. SSC members are selected by the SSC through an open competition. Jurisdictional members are recommended by their jurisdiction **for appointment by the Minister after consultation with the CESSC**. All jurisdictional members of COSEWIC have one Alternate, also recommended by their jurisdiction. Alternates are members of COSEWIC. The Co-Chairs of the ATK Subcommittee **are selected by the Subcommittee from among its members and are recommended by COSEWIC for appointment by the Minister after consultation with the CESSC²**.

ANNEX 2

COSEWIC Species Specialist Subcommittees:

There are **ten*** Species Specialist Subcommittees representing birds, terrestrial mammals, freshwater fishes, marine fishes, marine mammals, **vascular plants, mosses and lichens**, amphibians and reptiles, molluscs and arthropods.

*** Contingent upon approval by CESSC of COSEWIC's request to split the current Plants and Lichens Specialist Subcommittee into a Vascular Plants Specialist Subcommittee and a Mosses and Lichens Specialist Subcommittee. All current vascular plants expert members will henceforth be considered for the new Vascular Plants Specialist Subcommittee and all current mosses and lichens expert members will henceforth be considered for the new Mosses and Lichens Specialist Subcommittee.**

² Changes are proposed from the content of Annex 1 to reflect more accurately Section 16 of Species at Risk Act;

ANNEX 3COSEWIC Membership and voting structure:

Members of COSEWIC include 3 Non-government **scientific** experts, **20**** Co-Chairs of Species Specialist Subcommittees, 2 Co-Chairs of the Aboriginal Traditional Knowledge Subcommittee, one Member and one Alternate of the following Federal Agencies: Parks Canada, Fisheries and Oceans Canada, Canadian Wildlife Service, and the Canadian Museum of Nature on behalf of the **Federal Biodiversity Information Partnership**.

Membership from each of the following Provincial and Territorial agencies is as follows:

Yukon:	Department of Environment
Northwest Territories:	Department of Environment and Natural Resources
Nunavut:	Department of Environment
British Columbia:	Ministry of Water, Land and Air Protection
Alberta:	Department of Sustainable Resource Development
Saskatchewan:	Saskatchewan Environment
Manitoba:	Manitoba Conservation
Ontario:	Ontario Ministry of Natural Resources
Québec:	(1) Ministère des Ressources naturelles et de la Faune du Québec (for animals) and (2) Ministère du Développement durable, de l'Environnement et des Parcs du Québec (for plants, mosses and lichens)
New Brunswick:	Department of Natural Resources
Nova Scotia:	Department of Natural Resources
Prince Edward Island:	(1) Department of Environment, Energy and Forestry (for terrestrial species) and (2) Department of Agriculture, Fisheries and Aquaculture (for marine species)
Newfoundland and Labrador:	(1) Department of Environment and Conservation (for plants and animals except marine fishes) and (2) Department of Fisheries and Aquaculture (for marine, pelagic and demersal fish species)

There are 31voting members:** the 3 Non-government **scientific** experts, 1 Co-Chair for each of the **10**** Species Specialist Subcommittees, 1 Co-Chair of the Aboriginal Traditional Knowledge Subcommittee, 1 for each of the 4 Federal agencies and 1 for each of the 10 provinces and 3 territories.

**** One of the Co-chairs of the current Plants and Lichens Specialist Subcommittee will become a Co-chair of the Vascular Plants Specialist Subcommittee and the other Co-chair will become a Co-chair of the Mosses and Lichens Specialist Subcommittee. Contingent on approval, a call for applications for the remaining two Co-chair positions and any additional members required by the two subcommittees will take place in the autumn of 2007 or winter of 2008.**

APPENDIX VII

Guidelines for Processing Species Referrals by the Governor in Council to COSEWIC

**Approved by COSEWIC, April, 2007
Submitted for approval by CESCC**

Species referrals to COSEWIC

In accordance with Section 27(1.1) of the Species At Risk Act (SARA), the Governor in Council (GIC), within nine months after receiving an assessment of the status of a species by COSEWIC, may review that assessment and may, on the recommendation of the Minister of the Environment:

- (a) accept the assessment and add the species to the List;
- (b) decide not to add the species to the List;
- (c) refer the matter back to COSEWIC for further information or consideration.

Information requirements

COSEWIC will consider species referrals to constitute requests for re-assessments. In accordance with Section 24 of the Act, COSEWIC must review the classification of each species at risk, i.e., undertake a re-assessment:

- (a) at least once every 10 years; or
- (b) at any time if it has reason to believe that the status of the species has changed significantly.

Thus, excluding those undertaken every 10 years, species re-assessments by COSEWIC will be predicated by the presentation to COSEWIC of information likely to significantly affect the status of a wildlife species and lead to a change in its status assessment. Species referrals that are not accompanied by such additional information are unlikely to result in a re-assessment by COSEWIC.

Timelines for the communication of new information

In accordance with Section 27(1.2) of SARA, when GIC decides to refer species assessments back to COSEWIC, it must include a statement setting out the reasons for doing so in the Public Registry. However, because of their brevity, these statements often lack the detailed rationale that would allow COSEWIC to determine whether a re-assessment of the species is warranted.

To ensure an expeditious transfer of information, the rationale for species referrals, including all new information pertaining to the status of the species, would ideally be communicated to COSEWIC either:

- (a) at the time that the Minister's recommendations to GIC, as they pertain to Section 27(1.1), are first published in the SARA Public Registry and Canada Gazette Part 1,
- (b) or at the time that GIC's decisions regarding species referrals are published in the Public Registry and Canada Gazette part 2.

COSEWIC's response to species referrals

Upon receipt by COSEWIC of the rationale for the species referrals from the department(s) of the responsible Minister(s), the Chair of COSEWIC communicates the rationale to COSEWIC. After consultation with their SSCs, the Co-Chairs will provide COSEWIC with one of two recommendations for each of the referred species:

- (a) recommend that the species be reassessed by COSEWIC (based on a new report that incorporates the new information); or
- (b) recommend that COSEWIC confirm its original status assessment for the species.

The Chair of COSEWIC will then communicate the recommendation, and the SSC's rationale for its recommendation, to COSEWIC. If a motion for re-assessment passes, a revised status report that incorporates the new information will be prepared, and the Minister of the Environment will be informed accordingly. This report will normally be a 2-month Interim Report. Once prepared, the re-assessment will take place at the next Species Assessment Meeting. If a motion not to undertake a reassessment is passed by COSEWIC, the rationale for doing so will be communicated to the Minister of the Environment within one month of COSEWIC having reached the decision. COSEWIC's decisions and the rationales will be posted on its website at the same time they are communicated to the Minister.

APPENDIX VIII

COSEWIC Procedure Stemming from SARA Definition and Policy on Range Edge (or Peripheral) Species

Approved by COSEWIC in April 2007
Submitted for approval by CESSC

Range edge or peripheral species in Canada are not mentioned in Species at Risk Act (SARA), the Accord for the Protection of Species at Risk in Canada (Accord) or the National Framework for the Conservation of Species at Risk (Framework). The language of these documents, as well as SARA's definition of "wildlife species", indicate that all wildlife species within Canada are equally subject to the Act.

Background:

SARA: SARA (Section 2) defines a "wildlife species" as "a species, subspecies, variety or geographically or genetically distinct population of animal, plant or other organism, other than a bacterium or virus, that is wild by nature and (a) is native to Canada; or (b) has extended its range into Canada without human intervention and has been present in Canada for at least 50 years." SARA does not distinguish between wildlife species based on extent or proportion of range within Canada. SARA's only admonition to COSEWIC concerning trans-boundary species is that it must "indicate in the assessment whether the wildlife species migrates across Canada's boundary or has a range extending across Canada's boundary" (Section 15 [1, c.1]).

The Accord and the Framework: The stated goal of the Accord is to prevent species in Canada from becoming extinct as a consequence of human activity. The Accord acknowledges that species do not recognize jurisdictional boundaries and that the conservation of species at risk is a key component of the Canadian Biodiversity Strategy, which aims to conserve biological diversity in Canada. Signers of the Accord agree to establish complementary legislation and programs that provide for effective protection of species at risk throughout Canada, and that will address all native wild species. In support of the Accord, the Framework adds that COSEWIC will assess the status of species which may be at risk across their Canadian range. Neither the Accord nor the Framework consider any differential treatment of species according to the extent of their range inside or outside of Canada.

COSEWIC Terms of Reference and Procedures: The Terms of Reference for COSEWIC give the committee the role to assess the conservation status of species that may be at risk in Canada. No mention is made of peripheral or range edge species. The COSEWIC Operations and Procedures Manual, however, concedes that prioritization for assessment may consider, as a guideline, the relative extent of a species range in Canada in comparison to other eligible species.

COSEWIC Procedure, with reference to range edge species:

Accordingly, in making its assessments, COSEWIC considers without prejudice all wildlife species as defined by SARA, notwithstanding the extent of their extra-limital range, i.e. the range of the species outside of Canadian territorial jurisdiction, except

insofar as COSEWIC may assign higher priority for assessment to species that have a significant portion of their range or of their numbers in Canada over those that have a very small proportion of their range or numbers in Canada, all else being equal.

Supporting documentation

Following are relevant excerpts from the Species at Risk Act, Accord, Framework, COSEWIC Terms of Reference and COSEWIC Operations and Procedures Manual.

Species at Risk Act.

2. (1) The definitions in this subsection apply in this Act.

“wildlife species” means a species, subspecies, variety or geographically or genetically distinct population of animal, plant or other organism, other than a bacterium or virus, that is wild by nature and

- (a) is native to Canada; or
- (b) has extended its range into Canada without human intervention and has been present in Canada for at least 50 years.

15. (1) The functions of COSEWIC are to
(a) assess the status of each wildlife species considered by COSEWIC to be at risk [...]

(c.1) indicate in the assessment whether the wildlife species migrates across Canada’s boundary or has a range extending across Canada’s boundary;
[...]

Loi sur les espèces en péril.

2. (1) Les définitions qui suivent s’appliquent à la présente loi.

« espèce sauvage » Espèce, sous-espèce, variété ou population géographiquement ou génétiquement distincte d’animaux, de végétaux ou d’autres organismes d’origine sauvage, sauf une bactérie ou un virus, qui, selon le cas :

- a) est indigène du Canada;
- b) s’est propagée au Canada sans intervention humaine et y est présente depuis au moins cinquante ans.

15. (1) Le COSEPAC a pour mission :
a) d’évaluer la situation de toute espèce sauvage qu’il estime en péril [...]

c.1) de mentionner dans l’évaluation le fait que l’espèce sauvage traverse la frontière du Canada au moment de sa migration ou que son aire de répartition chevauche cette frontière, le cas échéant;

[...]

ACCORD FOR THE PROTECTION OF SPECIES AT RISK IN CANADA
September 30, 1996 (revised October 15, 1998)

Federal, provincial and territorial ministers responsible for wildlife commit to a national approach for the protection of species at risk. The goal is to prevent species in Canada from becoming extinct as a consequence of human activity.

We recognize that:

- i. species do not recognize jurisdictional boundaries and cooperation is crucial to the conservation and protection of species at risk;
- ii. the conservation of species at risk is a key component of the Canadian Biodiversity Strategy, which aims to conserve biological diversity in Canada; [...]

We agree to:

- iii. establish complementary legislation and programs that provide for effective protection of species at risk throughout Canada, and that will:
 - a. address all native wild species; [...]
-

A NATIONAL FRAMEWORK FOR THE CONSERVATION OF SPECIES AT RISK
September 30, 1996
(Supporting document to the National Accord)

APPROACH

1. COOPERATION AND MANAGEMENT AT THE APPROPRIATE SCALE
Species do not respect jurisdictional boundaries. [...]
 4. ASSESSMENT AND DESIGNATION OF SPECIES AT RISK NATIONALLY
COSEWIC will assess the status of species which may be at risk across their Canadian range, [...]
-

TERMS OF REFERENCE
COMMITTEE ON THE STATUS OF ENDANGERED WILDLIFE IN CANADA
(COSEWIC)
Approved by CESCC, September 2003

Role:

To assess the conservation status of species that may be at risk in Canada, to report the results of its assessments, including their reasons and uncertainties, to the Canadian Endangered Species Conservation Council (CESCC) and to the Canadian public. COSEWIC uses the best available scientific, Aboriginal and community knowledge to assess species. The assessment process is independent and transparent.S

COSEWIC OPERATIONS and PROCEDURES MANUAL
March 2006

Appendix E1: Guidelines for Developing, and Documenting the COSEWIC Candidate List and Priority List (2005)

[...]

The following guidelines are common to all prioritization schemes:

- [...]
- When all else is equal, species that have a significant portion of their range or of their numbers in Canada will be given higher priority than those that have a very small proportion of their range or numbers in Canada.
- [...]

ACCORD FOR THE PROTECTION OF SPECIES AT RISK IN CANADA
September 30, 1996
(revised October 15, 1998)

Federal, provincial and territorial ministers responsible for wildlife commit to a national approach for the protection of species at risk. The goal is to prevent species in Canada from becoming extinct as a consequence of human activity.

We recognize that:

- i. species do not recognize jurisdictional boundaries and cooperation is crucial to the conservation and protection of species at risk;
- ii. the conservation of species at risk is a key component of the Canadian Biodiversity Strategy, which aims to conserve biological diversity in Canada; [...]

We agree to:

- iii. establish complementary legislation and programs that provide for effective protection of species at risk throughout Canada, and that will:
 - a. address all native wild species; [...]

**A NATIONAL FRAMEWORK FOR THE
CONSERVATION OF SPECIES AT RISK
September 30, 1996
(Supporting document to the National Accord)**

APPROACH

1. COOPERATION AND MANAGEMENT AT THE APPROPRIATE SCALE
Species do not respect jurisdictional boundaries. [...]
 4. ASSESSMENT AND DESIGNATION OF SPECIES AT RISK NATIONALLY
COSEWIC will assess the status of species which may be at risk across their Canadian range, [...]
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**TERMS OF REFERENCE
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APPENDIX IX

COSEWIC Assessment Process, Categories and Guidelines

Revised and Approved by COSEWIC in April 2007
Submitted for approval by CESCC

Table 1. Determining eligibility of species for status assessment.

COSEWIC considers without prejudice all wildlife species as defined by SARA, notwithstanding the extent of their extra-limital range (i.e., the range of the species outside Canada), subject to the following criteria:

A) Taxonomic validity

COSEWIC would normally only consider species and subspecies or varieties that have been established as valid in published taxonomic works or in peer reviewed communications from taxonomic specialists. COSEWIC would not normally consider other designatable units unless they can be shown to be genetically distinct, separated by a major range disjunction, or biogeographically distinct (refer to Guidelines for Designatable Units Below the Species Level, Appendix F5). Justification for considering designatable units below the species level must be provided.

B) Native species

COSEWIC would normally only consider native species. A native species is a wild species that occurs in Canada naturally, or that has expanded its range into Canada without human intervention from a region where it naturally occurred, has produced viable populations, and has persisted in Canada for at least 50 years.

A wildlife species is, in the absence of evidence to the contrary, presumed to have been present in Canada for at least 50 years.

C) Regularity of occurrence

COSEWIC would normally only consider species which occur or formerly have occurred regularly in Canada, including regular or seasonal migrants but excluding vagrants.

D) Special cases

Notwithstanding the above guidelines, a taxon may be considered eligible if there are clear conservation reasons for consideration (for example high risk of extinction). In particular, a species which does not meet the eligibility criteria but which is at risk in its primary range outside of Canada could be considered for designation.

Reasons for considering a special case must be presented and supporting information must be provided; this should normally be reviewed and agreed to by COSEWIC before a status report is prepared.

Table 2. COSEWIC quantitative criteria and guidelines for the status assessment of species.

COSEWIC's revised criteria to guide the status assessment of species. These were in use by COSEWIC by November 2001, and are based on the revised IUCN Red List categories (IUCN 2001³). An earlier version of the quantitative criteria was used by COSEWIC from October 1999 to May 2001. For definitions of terms marked in bold italics, see COSEWIC's Glossary of Definitions and Abbreviations (Appendix C).

	Endangered	Threatened
A. Declining Total Population		
Reduction in population size based on any of the following 4 options and specifying a-e as appropriate:		
	≥ 70 %	≥ 50 %
(1) population size reduction that is observed, estimated, inferred, or suspected in the past 10 years or 3 generations, whichever is longer, where the causes of the reduction are clearly reversible AND understood AND ceased, based on (and specifying) one or more of a-e below.		
	≥ 50 %	≥ 30 %
(2) population size reduction that is observed, estimated, inferred or suspected over the last 10 years or 3 generations, whichever is longer, where the reduction or its causes may not have ceased OR may not be understood OR may not be reversible, based on (and specifying) one or more of a-e below.		
(3) population size reduction that is projected or suspected to be met within the next 10 years or 3 generations, whichever is longer (up to a maximum of 100 years), based on (and specifying) one or more of b-e below.		
(4) population size reduction that is observed, estimated, inferred, projected or suspected over any 10 year or 3 generation period, whichever is longer (up to a maximum of 100 years in the future), where the time period includes both the past and the future, AND where the reduction or its causes may not have ceased OR may not be understood OR may not be reversible, based on (and specifying) one or more of a-e below.		
	a) direct observation	
	b) an index of abundance appropriate for the taxon	
	c) a decline in area of occupancy, extent of occurrence and/or quality of habitat	
	d) actual or potential levels of exploitation	
	e) the effects of introduced taxa, hybridisation, pathogens, pollutants, competitors or parasites	
B. Small Distribution, and Decline or Fluctuation		
1. Extent of occurrence	< 5,000 km ²	< 20,000 km ²
or		
2. Area of occupancy	< 500 km ²	< 2,000 km ²

³ IUCN 2001. *IUCN Red List Categories and Criteria: Version 3.1*. Prepared by the IUCN Species Survival Commission. IUCN, Gland, Switzerland and Cambridge, UK.

	Endangered	Threatened
For either of the above, specify at least two of a-c:		
(a) either severely fragmented or known to exist at # locations	≤ 5	≤ 10
(b) continuing decline observed, inferred or projected in one or more of the following:	i) extent of occurrence ii) area of occupancy iii) area, extent and/or quality of habitat iv) number of locations or populations v) number of mature individuals	
(c) extreme fluctuations in one or more of the following:	> 1 order of magnitude	> 1 order of magnitude
	i) extent of occurrence ii) area of occupancy iii) number of locations or populations iv) number of mature individuals	

C. Small Total Population Size and Decline

Number of mature individuals	< 2,500	< 10,000
and 1 of the following 2:		
(1) an estimated continuing decline rate of at least:	20% in 5 years or 2 generations whichever is longer (up to a maximum of 100 years in the future)	10% in 10 years or 3 generations whichever is longer (up to a maximum of 100 years in the future)
(2) continued decline, observed, projected, or inferred, in numbers of mature individuals and at least one of the following (a-b) :		
a) population structure in the form of one of the following:	(i) no population estimated to contain >250 mature individuals (ii) at least 95 % of mature individuals in one population	
	(i) no population estimated to contain >1,000 mature individuals (ii) all mature individuals are in one population	
b) extreme fluctuations in the number of mature individuals		

D. Very Small Population or Restricted Distribution

(1) number of mature individuals estimated to be	< 250	< 1,000
or		
(2) Applies only to threatened: Population with a very restricted area of occupancy (area of occupancy typically < 20 km ²) or number of locations (typically 5 or fewer) such that it is prone to the effects of human activities or stochastic events within a very short time period in an uncertain future, and thus is capable of becoming highly endangered or even extinct in a very short time period.		

	Endangered	Threatened
E. Quantitative Analysis		
Indicating the probability of extinction in the wild to be at least:	20% in 20 years or 5 generations, whichever is longer (up to a maximum of 100 years)	10% in 100 years

Special Concern:

those species that are particularly sensitive to human activities or natural events but are not endangered or threatened species.

Species may be classified as being of Special Concern if:

- 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
- 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
- the species is near to qualifying, under any criterion, for Threatened status; or
- the species qualifies for Threatened status but there is clear indication of rescue effect from extra-limital populations.

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

Guidelines for use of Extinct or Extirpated

A species may be assessed as extinct or extirpated from Canada if:

- there exists no remaining habitat for the species and there have been no records of the species despite recent surveys; or
- 50 years have passed since the last credible record of the species, despite surveys in the interim; or
- there is sufficient information to document that no individuals of the species remain alive.

Guidelines for use of Data Deficient

Data Deficient should be used for cases where the status report has fully investigated all best available information yet that information is insufficient to: a) satisfy any criteria or assign any status, or b) 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 been sufficiently intensive or extensive or have not been

conducted at the appropriate time of the year or under suitable conditions to ensure the reliability of the conclusions drawn from the data gathered.

- The species' occurrence in Canada cannot be confirmed or denied with assurance.

Data Deficient should **not** be used if: a) the choice between two status designations is difficult to resolve by COSEWIC, or b) the status report is inadequate and has not fully investigated all best available information (in which case the report should be rejected), or c) the information available is minimally sufficient to assign status but inadequate for recovery planning or other such use.

Table 3. Guidelines for modifying status assessment based on rescue effect.

COSEWIC's approach to assigning status is, first, to examine the Canadian status of a species or other Designatable Unit in isolation and then, if deemed appropriate, to consider the potential for "rescue" from extra-regional populations (e.g., from across an international boundary or from another Designatable Unit within Canada). The rescue effect is the immigration of gametes or individuals that have a high probability of reproducing successfully, such that extirpation or decline of a species, or some other Designatable Unit, can be mitigated. If the potential for rescue is high, the risk of extirpation may be reduced, and the status may be downgraded. COSEWIC addresses this by applying the following guidelines developed by IUCN for this purpose (Gardenfors et al. 1999⁴).

Likelihood of propagule migration

Are there any extra-regional populations within a distance from which propagules could reach the region? Are there any effective barriers preventing dispersal to and from extra-regional populations? Is the species capable of long-distance dispersal? Is it known to do so?

If there are no extra-regional populations or propagules are not able to disperse to the region, the regional population behaves as an endemic 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 and extra-regional populations, i.e. is it probable that individuals from extra-regional populations are adapted to survive within the region?

If it is unlikely that individuals from extra-regional populations would be able to survive within the region, the status category should be left unchanged.

Availability of suitable habitat

Are current conditions of habitats and/or other environmental (including climatological) requirements of the taxon

If there is not enough suitable habitat and current conservation measures are not leading to an improvement of the habitat within a foreseeable future,

⁴ Gardenfors, U., J.P.Rodriguez, C. Hilton-Taylor, C. Hyslop, G. Mace, S. Molur and S. Poss. 1999. *Draft guidelines for the application of Red List criteria at national and regional levels*. Species 31-32:58-70.

in the region such that immigrating propagules are able to successfully establish themselves (i.e. are there inhabitable patches), or has the taxon disappeared from the region because conditions were not favourable?

immigration from outside the region will not decrease extinction risk and the status category should be left unchanged.

Status of extra-regional populations

How abundant is the taxon in neighbouring regions? Are the populations there stable, increasing or decreasing? Are there any important threats to those populations? Is it probable that they produce an appreciable number of emigrants, and will continue to do so for the foreseeable future?

If the taxon is more or less common outside the region and there are no signs of population decline, and if the taxon is capable of dispersing to the region and there is (or soon will be) available habitat, downgrading the category is appropriate. If the population size of extra-regional populations is declining, the 'rescue effect' is less likely to occur, hence downgrading the status category may not be appropriate.

Degree of dependence on extra-regional sources

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

If there is evidence that a substantial number of propagules regularly reach the region and the population still has a poor survival, the regional population may be a sink. If so, and there are indications that the immigration will soon cease, upgrading the status category may be appropriate.

Table 4: Policy for modifying status assessment based on quantitative criteria

COSEWIC, IUCN and other groups recognize the need for additional assessment tools. Specifically, there is a need to consider life-history variation amongst species and other taxa. COSEWIC has developed the following guideline:

In addition to the quantitative guidelines, COSEWIC will base its assessment on the degree to which various life-history characteristics (e.g., age & size at maturity, dispersal strategy, longevity) affect extinction probability and the likelihood that the species is vulnerable to the Allee effects of density dependence.

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 indeterminately growing organisms (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.*

Table 5. COSEWIC status categories.

Extinct (X) -	A wildlife species that no longer exists.
Extirpated (XT) -	A wildlife species no longer existing in the wild in Canada, but occurring elsewhere.
Endangered (E) -	A wildlife species facing imminent extirpation or extinction.
Threatened (T) -	A wildlife species likely to become endangered if limiting factors are not reversed.
Special Concern (SC) -	A wildlife species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats.
Data Deficient (DD) -	A category that applies when the available information is insufficient (a) to resolve a wildlife species' eligibility for assessment or (b) to permit an assessment of the wildlife species' risk of extinction.
Not At Risk (NAR) -	A wildlife species that has been evaluated and found to be not at risk of extinction given the current circumstance

APPENDIX X

Detailed COSEWIC Species Assessments, November 2006

Results are grouped by taxon and then by status category. A reason for designation is given for each species. A short history of status designations follows. The range of occurrence in Canada for each species (by province, territory, or ocean) is provided.

Mammals

Sowerby's Beaked Whale *Mesoplodon bidens* **Special Concern**
Assessment Criteria not applicable

Reason for Designation

This small beaked whale is endemic to the North Atlantic Ocean where it is found mainly in deep, offshore temperate to subarctic waters. Little is known about its biology, fine-scaled distribution, and abundance. It belongs to a family of whales (Ziphiidae) in which acute exposure to intense sounds (especially from military sonar, but also from seismic operations) has led to serious injury and mortality. Seismic operations are currently widespread and military activities involving the use of mid- and low-frequency sonar likely occur at least occasionally in the habitat of this species off Canada's East Coast. Although there is no direct evidence that such sound sources have affected this species, there is strong evidence for lethal effects on individuals of related species. Thus there is reasonable cause for concern about the potential effects on individuals of this species. The potential population-level impacts of this type of mortality are unknown.

Range Atlantic Ocean

Status History

Designated Special Concern in April 1989 and in November 2006.

Fishes

Lake Sturgeon *Acipenser fulvescens* **Endangered**
Winnipeg River - English River populations
Assessment Criteria A2bcd

Reason for Designation

Historically, populations in this designatable unit supported a large commercial fishery. However, there are limited historical and recent data. The limited recent data available show that populations are declining in the Winnipeg River above Seven Sisters Dam, and essentially have disappeared below the dam. Historically, overexploitation probably was the primary threat; now dams and poaching probably are the most important threats.

Range MB ON

Status History

The species was considered a single unit and designated Not at Risk in April 1986. When the species was split into separate units in May 2005, the "Western populations" unit was designated Endangered. In November 2006, when the Western populations unit was split into five separate populations, the "Winnipeg River - English River populations" unit was designated Endangered.

Lake Sturgeon	<i>Acipenser fulvescens</i>	Endangered
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Nelson River populations

Assessment Criteria A2b

Reason for Designation

Portions of this designatable unit sustained large commercial fisheries from the early to mid-1900s, during which time there were dramatic declines in landings. More recently, a fishery at Sipiwesk Lake exhibited an 80-90% decline in landings from 1987-2000; and groups of 5-6 spawning fish were observed in the Landing River in 1990 compared to 100s observed several decades ago. Historically, overexploitation probably was the primary threat; more recently, dams probably are the most important threat.

Range MB

Status History

The species was considered a single unit and designated Not at Risk in April 1986. When the species was split into separate units in May 2005, the "Western populations" unit was designated Endangered. In November 2006, when the Western populations unit was split into five separate populations, the "Nelson River populations" unit was designated Endangered.

Lake Sturgeon	<i>Acipenser fulvescens</i>	Endangered
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Saskatchewan River populations

Assessment Criteria A2b

Reason for Designation

Seventy-six of 111 historic sites in Saskatchewan and Alberta have been lost and there has been an 80% decline reported in the Cumberland House area from 1960-2001. A 50% decline from 1998 to 2003 has also been reported in the lower Saskatchewan River from Cumberland House to The Pas in Manitoba.

Range AB SK MB

Status History

The species was considered a single unit and designated Not at Risk in April 1986. When the species was split into separate units in May 2005, the "Western populations" unit was designated Endangered. In November 2006, when the Western populations unit was split into five separate populations, the "Saskatchewan River populations" unit was designated Endangered.

Lake Sturgeon	<i>Acipenser fulvescens</i>	Endangered
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Western Hudson Bay populations

Assessment Criteria A2ad; C1+2a(ii)

Reason for Designation

A precipitous > 98% decline from 1929-1939 has been followed by a slow, steady decline in the Churchill River to the point that records of mature individuals are almost non-existent in the past five years. Historically, overexploitation probably was the primary threat; more recently, dams are probably the most important threat.

Range SK MB

Status History

The species was considered a single unit and designated Not at Risk in April 1986. When the species was split into separate units in May 2005, the "Western populations" unit was designated Endangered. In November 2006, when the Western populations unit was split into five separate populations, the "Western Hudson Bay populations" unit was designated Endangered.

Lake Sturgeon	<i>Acipenser fulvescens</i>	Endangered
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Red-Assiniboine Rivers - Lake Winnipeg populations

Assessment Criteria A2bc; C2a(i)

Reason for Designation

A very large commercial fishery existed between the late 1800s and early 1900s. Since then (i.e. in the last 3-5 generations), the species has virtually disappeared from the Red-Assiniboine River and Lake Winnipeg. This was primarily the result of overfishing, although dams probably also affect remnant populations.

Range SK MB ON

Status History

The species was considered a single unit and designated Not at Risk in April 1986. When the species was split into separate units in May 2005, the "Western populations" unit was designated Endangered. In November 2006, when the Western populations unit was split into five separate populations, the "Red-Assiniboine Rivers - Lake Winnipeg populations" unit was designated Endangered.

Misty Lake Lentic Stickleback	<i>Gasterosteus sp.</i>	Endangered
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Assessment Criteria A3e

Reason for Designation

This lake-dwelling fish is part of an endemic, highly divergent species pair restricted to a single stream-lake complex on Vancouver Island with an extremely small area of occurrence. This species pair could quickly become extinct due the introduction of non-native aquatic species or perturbations to the habitat. Proximity of this complex to a major highway and public access makes an introduction likely. Logging activities in the watershed, as well as highway use and related maintenance, could impact habitat quality to some degree.

Range BC

Status History

Designated Endangered in November 2006.

Misty Lake Lotic Stickleback	<i>Gasterosteus sp.</i>	Endangered
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Assessment Criteria A3e

Reason for Designation

This stream-dwelling fish is part of an endemic, highly divergent species pair restricted to a single stream-lake complex on Vancouver Island with an extremely small area of occurrence. This species pair could quickly become extinct due the introduction of non-native aquatic species or perturbations to the habitat. Proximity of this complex to a major highway and public access makes an introduction likely. Logging activities in the watershed, as well as highway use and related maintenance, could impact habitat quality to some degree.

Range BC

Status History

Designated Endangered in November 2006.

Lake Sturgeon *Acipenser fulvescens* **Threatened**

Great Lakes - Upper St. Lawrence populations

Assessment Criteria Meets criteria for Endangered A2abcd, but designated Threatened A2abcd because although a quarter of the populations have been lost, more than half of the remaining populations are either stable or recovering.

Reason for Designation

A very large commercial fishery existed in the Great Lakes between the mid-1800s and early 1900s (i.e. 2-3 generations ago) during which time populations of this species were reduced to a small fraction of their original size, and appear to be still at very low levels. Populations appear to be declining in parts of the Ottawa River, and disappearing from many of its tributaries due to dams. There has been a recent decline in the population in the St. Lawrence River probably due to over-exploitation despite recovery efforts. The direct and indirect effects of dams, chemical control of sea lamprey, contaminants and invasive species currently threaten populations.

Range ON QC

Status History

The species was considered a single unit and designated Not at Risk in April 1986. When the species was split into separate units in May 2005, the "Great Lakes - Upper St. Lawrence populations" unit was designated Special Concern. Status re-examined and designated Threatened in November 2006.

Westslope Cutthroat Trout *Oncorhynchus clarkii lewisi* **Threatened**

Alberta population

Assessment Criteria B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v); C2a(i)

Reason for Designation

Native populations have been reduced by almost 80% through over-exploitation, habitat degradation, and hybridization / competition with introduced, non-native trout. Remaining, genetically pure, individuals persist as mainly severely fragmented, remnant headwater populations. It should be noted that this assessment includes only genetically pure, native populations of the species occurring within their historical range. Any populations known either to be hybridized significantly (i.e. >1%) with other trout species, or to have been introduced into a system previously free of native populations, were not assessed.

Range AB

Status History

Designated Threatened in May 2005 and in November 2006.

Lake Sturgeon *Acipenser fulvescens* **Special Concern**

Lake of the Woods – Rainy River populations

Assessment Criteria not applicable

Reason for Designation

Historically, populations in this designatable unit supported a substantial commercial fishery. Although this led to a severe decline, recovery has been sustained since 1970. Dams have not impeded access to important stretches of suitable habitat, but do restrict immigration from the adjacent Winnipeg River.

Range ON

Status History

The species was considered a single unit and designated Not at Risk in April 1986. When the species was split into separate units in May 2005, the "Lake of the Woods – Rainy River populations" unit was designated Special Concern. Status re-examined and confirmed in November 2006.

Lake Sturgeon	<i>Acipenser fulvescens</i>	Special Concern
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Southern Hudson Bay - James Bay populations

Assessment Criteria not applicable

Reason for Designation

There are limited population data available for populations in this designatable unit and there have been declines in habitat and possibly abundance for some population components related to exploitation and the multitude of dams. The increased access to relatively unimpacted populations and the likelihood of increased hydroelectric development in some areas are causes for concern for this designatable unit.

Range MB ON QC

Status History

The species was considered a single unit and designated Not at Risk in April 1986. When the species was split into separate units in May 2005, the "Southern Hudson Bay - James Bay populations" unit was designated Special Concern. Status re-examined and confirmed in November 2006.

Westslope Cutthroat Trout	<i>Oncorhynchus clarkii lewisi</i>	Special Concern
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British Columbia population

Assessment Criteria not applicable

Reason for Designation

Populations are stressed by hybridization and competition with introduced species. Furthermore, expanding urban development, agricultural activities and resource-based industries are expected to lead to additional stresses associated with habitat loss and degradation, as well as increased exploitation. It should be noted that this assessment includes only genetically pure, native populations of the species occurring within their historical range. Any populations known to be hybridized significantly (i.e. >1%) with other trout species, or to have been introduced into a system previously free of native populations, were not assessed.

Range BC

Status History

Designated Special Concern in May 2005. Status re-examined and confirmed in November 2006.

Greenside Darter	<i>Etheostoma blennioides</i>	Not at Risk
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Assessment Criteria not applicable

Reason for Designation

Recent surveys have shown that the species is widespread and abundant in the Ausable, Sydenham and Thames rivers as well as Lake St. Clair. The total Canadian population has also increased through the recent colonization of the Bayfield River, Big Otter Creek, Detroit River and Grand River. Rescue of greenside darter populations in Canada is possible from Michigan populations.

Range ON

Status History

Designated Special Concern in April 1990. Status re-examined and designated Not at Risk in November 2006.

Vascular Plants

Scouler's Corydalis

Corydalis scouleri

Not at Risk

Assessment Criteria not applicable

Reason for Designation

A conspicuous perennial herb of riverside habitats that is restricted to a small region of south-western Vancouver Island. The species was previously assessed as threatened but is now known to be present at additional locations and is much more abundant than previously documented. There is no evidence of population decline or fluctuation and no significant threats appear to affect the species. More than one-half of the population is now in protected areas specifically managed for this species and, since extensive areas of suitable habitat remain to be surveyed, additional populations will likely be discovered.

Range BC

Status History

Designated Threatened in May 2001. Status re-examined and designated Not at Risk in November 2006.

Mosses

Nugget Moss

Microbryum vlassovii

Endangered

Assessment Criteria D1

Reason for Designation

In North America, this globally rare moss is known from only three localized sites. Two of these sites are in semi-arid areas of south-central British Columbia. Recent surveys have re-located the species at only one of these. This moss grows on fine soils on the steep portions of silt banks in early stages of plant community development. The extremely small populations render this moss vulnerable to disturbance. Threats include potential road development and maintenance of existing roads, and collection of specimens.

Range BC

Status History

Designated Endangered in November 2006.

* The status reports on Wood Turtle (*Glyptemys insculpta*) and Chimney Swift (*Chaetura pelagica*) were withdrawn. These species will be re-considered by COSEWIC in April 2007. The status report on the Loggerhead Seaturtle (*Caretta caretta*) was rejected and a revised version of the status report will be prepared.

11/12/2006

Detailed COSEWIC Species Assessments, April 2007

Results are grouped by taxon and then by status category. A reason for designation is given for each species. A short history of status designations follows. The range of occurrence in Canada for each species (by province, territory, or ocean) is provided.

Mammals

Western Harvest Mouse *dychei* subspecies ***Reithrodontomys megalotis dychei*** **Endangered**

Assessment Criteria B1ab(iii)+2ab(iii)c(iv)

Reason for Designation

This subspecies has a limited range and has been found at only one location in the past 40 years; this location is isolated from others. Dispersal distance is limited and the population fluctuates. This species is commonly found in owl pellets in the USA, but none have been reported in owl pellets (including burrowing owls) in Suffield or other areas in southeast Alberta, despite substantial sampling. Owl pellet analysis is an excellent means of sampling for these mice.

Range AB

Status History

Species considered in April 1994 and placed in the Data Deficient category. Re-examined in April 2007 and designated Endangered.

American Marten ***Martes americana atrata*** **Threatened**
Newfoundland population

Assessment Criteria D1

Reason for Designation

Marten in Newfoundland have declined substantially over the last century. The current population consists of 300-600 mature marten in 5 subpopulations. It is still at risk because of snaring and trapping outside of protected areas and because of forest harvesting. A small decrease in population size would likely result in consideration for Endangered status. The marten is one of few land mammals native to Newfoundland and the sub-species is endemic to Canada.

Range NL

Status History

Designated Not at Risk in April 1979. Status re-examined and designated Threatened in April 1986. Status re-examined and designated Endangered in April 1996 and in May 2000. Status re-examined and designated Threatened in April 2007.

Sea Otter ***Enhydra lutris*** **Special Concern**

Assessment Criteria not applicable

Reason for Designation

The species had been extirpated in British Columbia by the fur trade by the early 1900s, and was re-introduced from 1969-72. It has since repopulated 25-33% of its historic range in British Columbia, but is not yet clearly secure. Numbers are small (<3,500) and require careful monitoring. Their susceptibility to oil and the proximity to major oil tanker routes make them particularly vulnerable to oil spills.

Range BC Pacific Ocean

Status History

Designated Endangered in April 1978. Status re-examined and confirmed Endangered in April 1986. Status re-examined and designated Threatened in April 1996 and in May 2000. Status re-examined and designated Special Concern in April 2007.

Western Harvest Mouse <i>megalotis</i> subspecies	<i>Reithrodontomys megalotis megalotis</i>	Special Concern
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Assessment Criteria not applicable

Reason for Designation

This subspecies has a limited range, and a small extent of occurrence and area of occupancy. However, the extent of occurrence and area of occupancy appear to be constant. Its principal native habitat in the Okanagan as well as old fields is declining. Furthermore, old apple orchards where the mouse has been caught are being converted to vineyards. Dispersal distance is limited and the likelihood of rescue effect is small. Extensive sampling has revealed the occurrence of the mouse at more localities. 63,000 hectares of suitable habitat is protected.

Range BC

Status History

Designated Special Concern in April 1994 and in April 2007.

Bearded Seal	<i>Erignathus barbatus</i>	Data Deficient
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Assessment Criteria not applicable

Reason for Designation

The species has a circumpolar Arctic distribution. No complete, reliable or recent estimates of total abundance and spatial distribution in Canada are available, nor is any reliable information available on population trends. The species remains widespread in areas of broken pack ice. It is known to be highly dependent on sea ice as a platform used to haul out to rest, moult, give birth and nurse pups. However, the information available on climate and sea ice changes and how such changes might affect the species is insufficient to support an evaluation of their potential as a population-level threat to the species.

Range NT NU MB ON NL Arctic Ocean Atlantic Ocean

Status History

Designated Not at Risk in April 1994. Species considered in April 2007 and placed in the Data Deficient category.

Birds

Prothonotary Warbler	<i>Protonotaria citrea</i>	Endangered
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Assessment Criteria A2b; C2a(i); D1

Reason for Designation

In Canada, this species breeds only in deciduous swamp forests in southwestern Ontario. It has shown an 80% decrease in abundance over the last 10 years and its current population is between 28 and 34 mature individuals only. Threats include loss and degradation of breeding habitat, loss of coastal mangrove forests in Central and South America where the species winters, and disturbances of habitat that result in increased nest site competition with House Wrens and increased nest parasitism by Brown-headed Cowbirds.

Range ON

Status History

Designated Special Concern in April 1984. Status re-examined and designated Endangered in April 1996. Status re-examined and confirmed in May 2000 and in April 2007.

Red Knot *rufa* subspecies *Calidris canutus rufa* **Endangered**
Assessment Criteria A2b

Reason for Designation

This subspecies is a medium-sized shorebird that breeds only in Arctic Canada and migrates thousands of kilometres between its Arctic breeding grounds and wintering areas at the tip of South America. The subspecies has shown a 70% decline in abundance over the past three generations (15 years). It is threatened by a depletion of horseshoe crab eggs, a critical food source used during northern migration. There is no potential for rescue from other populations.

Range NT NU BC AB SK MB ON QC NB PE NS NL

Status History

Designated Endangered in April 2007.

Chimney Swift *Chaetura pelagica* **Threatened**
Assessment Criteria A2c

Reason for Designation

The Canadian population of this species has declined by almost 30% over the last three generations (13.5 years) and the area it occupies has declined by a third over the same time period. The estimated Canadian population is about 12,000 individuals. Many aerial insectivores, including this species, swallows and nighthawks, have suffered population declines throughout the Americas over the past 30 years. The causes for these widespread declines are unknown but likely involve impacts to insect populations through pesticide use and habitat loss. Of this species group, the current species has had the most serious known decline, probably because of the steadily decreasing number of suitable chimneys that the swifts use for nesting and roosting. Very few natural sites (large hollow trees) exist and current forest management regimes make it unlikely that many more will be available in the future. The species also experiences significant mortality when hurricanes cross migratory paths; this could become a more important source of population loss if the frequency of these storms increase in the future as some climate models suggest

Range SK MB ON QC NB NS NL

Status History

Designated Threatened in April 2007.

Common Nighthawk *Chordeiles minor* **Threatened**
Assessment Criteria A2b

Reason for Designation

In Canada, this species has shown both long and short-term declines in population. A 49% decline was determined for areas surveyed over the last three generations. Reduction of food sources has apparently contributed to the decline of this species, as with several other aerial insectivores. Reductions in habitat availability, caused by fire suppression, intensive agriculture, and declines in the number of gravel rooftops in urban areas, may also be factors in some regions.

Range YT NT BC AB SK MB ON QC NB PE NS NL

Status History

Designated Threatened in April 2007.

Peregrine Falcon *anatum/tundrius* *Falco peregrinus anatum/tundrius* Special Concern
Assessment Criteria not applicable

Reason for Designation

Continental populations of this species have shown continuing increases in population size since the 1970's up to near historical numbers. Population thresholds for downlisting have been achieved for both the *tundrius* and *anatum* subspecies. This recovery has been the result of reintroductions across much of southern Canada, and natural increases in productivity following the ban in Canada of organochlorine pesticides (e.g. DDT). These compounds were the primary factor responsible for the historic decline. These pesticides continue to be used on the wintering grounds, and continue to be found in peregrine tissues, albeit at levels that do not significantly affect reproductive success. The unknown effects of new pesticides regularly licensed for use in Canada are also a concern.

Range YT NT NU BC AB SK MB ON QC NB NS NL

Status History

The Peregrine Falcon in Canada was originally evaluated by COSEWIC as three separate subspecies: *anatum* subspecies (Endangered in April 1978, Threatened in April 1999 and in May 2000), *tundrius* subspecies (Threatened in April 1978 and Special Concern in April 1992) and *pealei* subspecies (Special Concern in April 1978, April 1999 and November 2001). In April 2007, the Peregrine Falcon in Canada was assessed as two separate units: *pealei* subspecies and *anatum/tundrius*. Peregrine Falcon *anatum/tundrius* was designated Special Concern in April 2007.

Peregrine Falcon *pealei* subspecies *Falco peregrinus pealei* Special Concern
Assessment Criteria Met criteria for Endangered, D1, but designated Special Concern because of increasing population size, potential for rescue, and because a significant portion of the population breeds in protected areas.

Reason for Designation

This subspecies occurs in small numbers along most of the coastal area of British Columbia, where it breeds mostly in protected areas. Its population has shown ongoing increases in size over the last 35 years. Immigration from the United States, where numbers are stable, is likely.

Range BC

Status History

The Peregrine Falcon in Canada was originally evaluated by COSEWIC as three separate subspecies: *anatum* subspecies (Endangered in April 1978, Threatened in April 1999 and in May 2000), *tundrius* subspecies (Threatened in April 1978 and Special Concern in April 1992) and *pealei* subspecies (Special Concern in April 1978, April 1999 and November 2001). In April 2007, the Peregrine Falcon in Canada was assessed as two separate units: *pealei* subspecies and *anatum/tundrius*. The Peregrine Falcon *pealei* subspecies was designated Special Concern in April 2007.

Red Knot *islandica* subspecies *Calidris canutus islandica* Special Concern
Assessment Criteria not applicable

Reason for Designation

This subspecies is a medium-sized Arctic breeding shorebird that migrates to wintering grounds in Europe. Forty percent of the breeding population of this subspecies occurs in Canada. This subspecies has declined by 17% over the last three generations (15 years). There are no identified threats to individuals in Canada. Habitat on the Canadian breeding grounds is likely stable, but shellfish harvesting on the wintering grounds in Europe presents an ongoing threat.

Range NT NU

Status History

Designated Special Concern in April 2007.

Reptiles

Pygmy Short-horned Lizard *Phrynosoma douglasii* **Extirpated**
Assessment Criteria not applicable

Reason for Designation

There have been no confirmed sightings in Canada in the past 50 years, although there have been anecdotal reports during that time.

Range BC

Status History

Last reported in 1898. Designated Extirpated in April 1992. Status re-examined and confirmed in May 2000 and in April 2007.

Gray Ratsnake *Elaphe spiloides* **Endangered**
Carolinian population
Assessment Criteria B2ab(iii,iv,v)

Reason for Designation

This population consists of only 4 highly disjunct subpopulations in southwest Ontario, all of which are small and isolated, and surrounded by agricultural and developed terrain. Their slow rate of reproduction and late age of maturity makes them especially vulnerable to increases in adult mortality from road traffic and agricultural machinery.

Range ON

Status History

The species was considered a single unit and designated Threatened in April 1998 and in May 2000. Split into two populations in April 2007. The Carolinian population was designated Endangered in April 2007.

Five-lined Skink *Eumeces fasciatus* **Endangered**
Carolinian population
Assessment Criteria B1+2ab(i,ii,iii,iv,v)

Reason for Designation

The species is the only lizard in Eastern Canada. The Carolinian population occurs in only 4 or 5 small, completely isolated populations on the shores of lakes Erie, St. Clair and Huron. Threats to this skink include loss and degradation of microhabitat, illegal collecting, increased depredation by racoons, coyotes, dogs and cats, and increased mortality on roads. If any population is extirpated, because of isolation there is no chance of natural recolonization.

Range ON

Status History

The species was considered a single unit and designated Special Concern in April 1998. Split into two populations in April 2007. The Carolinian population was designated Endangered in April 2007.

Greater Short-horned Lizard *Phrynosoma hernandesi* **Endangered**
Assessment Criteria B2ab(iii)

Reason for Designation

In Canada, this species exists in less than 10 scattered locations that are severely fragmented. Most of these populations are threatened by ongoing oil and gas development, proliferation of roads, proposed mineral development, and an increasing human presence.

Range AB SK

Status History

Designated Special Concern in April 1992. Status re-examined and designated Endangered in April 2007.

Gray Ratsnake	<i>Elaphe spiloides</i>	Threatened
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Great Lakes / St. Lawrence population

Assessment Criteria B1ab(i,ii,iii)+2ab(i,ii,iii)

Reason for Designation

This large snake occupies a restricted region in Ontario and is threatened by ongoing development and by expansion of the road network. Development is especially a threat to hibernacula which may be limiting. Roads represent a significant threat because of the snakes' late age of maturity and low reproductive rate. Snakes are also killed on roads because they move slowly and may bask on roads.

Range ON

Status History

The species was considered a single unit and designated Threatened in April 1998 and in May 2000. Split into two populations in April 2007. The Great Lakes / St. Lawrence population was designated Threatened in April 2007.

Five-lined Skink	<i>Eumeces fasciatus</i>	Special Concern
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Great Lakes / St. Lawrence population

Assessment Criteria not applicable

Reason for Designation

The species is the only lizard in Eastern Canada. This small and secretive species is known from about 84 local populations, but has a small geographic distribution. Threats to the skink include loss and degradation of habitat, alteration of microhabitat, illegal collection, increased depredation by cats and dogs and increased mortality on roads. Increasing development in the species' range will make populations more isolated and more susceptible to stochastic events on small sites.

Range ON

Status History

The species was considered a single unit and designated Special Concern in April 1998. Split into two populations in April 2007. The Great Lakes / St. Lawrence population was designated Special Concern in April 2007.

Amphibians

Allegheny Mountain Dusky Salamander	<i>Desmognathus ochrophaeus</i>	Endangered
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Carolinian population

Assessment Criteria D1

Reason for Designation

This is a small and secretive salamander, with aquatic larvae, that inhabits forested brooks, cascades, springs, or seeps where there is abundant cover in the form of crevices between stones, leaf litter, or logs. This species' entire range in the Carolinian faunal province consists of a single, cascading stream in the Niagara Gorge, occupying no more than about 0.005 km². The locality is isolated from any other population of the same species, the nearest being about 22 km away in New York State. Surveys to date have located and identified some 22 individuals and indicate a total adult population that is probably fewer than 100 individuals. Its minute range makes this salamander highly susceptible to stochastic events and the species would easily and rapidly become extirpated if any change to its habitat were to take place. The major threats to this salamander in Carolinian faunal province are any activities that could affect the water table and dry out the spring that supplies its habitat, degrade groundwater flow and quality or deplete groundwater reserves.

Range ON

Status History

This newly-recognized population of individuals not previously assessed by COSEWIC was designated Endangered in April 2007.

Allegheny Mountain Dusky Salamander*Desmognathus ochrophaeus***Threatened****Great Lakes / St. Lawrence population**Assessment Criteria D2Reason for Designation

This is a small and secretive salamander, with aquatic larvae, that inhabits forested brooks, cascades, springs, or seeps where there is abundant cover in the form of crevices between stones, leaf litter, or logs. This species has a very small range of less than 100 km² in the Great Lakes/St. Lawrence faunal province in a single locality at the northernmost edge of the Adirondack Mountains. At this locality, the salamanders occupy some 8 to 10 streams and seeps with a total area of occupancy of under 10 km². All of these streams emanate from a single water source. The locality is isolated from any other population of the same species, the nearest other locality is about 90 km away in New York State. Its minute range makes this salamander highly susceptible to stochastic events and the species would easily become endangered if major changes to its habitat were to take place. The major threats to this salamander in Great Lakes/St. Lawrence faunal province are any that could affect the water table and dry out seeps and springs in its habitat, degrade groundwater flow and quality or deplete groundwater reserves. Logging at the single water source could destroy terrestrial habitat by increasing siltation in streams and altering hydrological regimes.

Range QCStatus History

Designated Special Concern in April 1998. Status re-examined and designated Threatened in November 2001. In April 2007, renamed to Allegheny Mountain Dusky Salamander (Great Lakes / St. Lawrence population) and designated Threatened.

Great Basin Spadefoot*Spea intermontana***Threatened**Assessment Criteria B2ab(ii,iii)c(iv)Reason for Designation

This small, rotund, toad-like amphibian has under each hind foot a prominent tubercle, or “spade”, which it uses for burrowing. The species has a restricted distribution in Canada in the semi-arid and arid areas of southern interior British Columbia. Parts of this region are experiencing rapid loss and alteration of critical habitats for the spadefoot, including loss of breeding sites, because of urban and suburban expansion, increased agriculture and viticulture, and the introduction of alien fish species and disease. The protected areas it inhabits are losing surrounding natural buffer habitats due to encroaching agricultural and housing developments. In consequence, available habitat in some parts of the range is becoming fragmented, resulting in increased local extinction probabilities for the sites that remain. Although spadefoots may use artificial habitats for breeding, there is evidence that such habitats may be ecological traps from which there may be little or no recruitment.

Range BCStatus History

Designated Special Concern in April 1998. Status re-examined and designated Threatened in November 2001 and in April 2007.

Fishes

Masking Shark *Cetorhinus maximus* **Endangered**

Pacific population

Assessment Criteria A2a; C1

Reason for Designation

This shark species is the only extant species in the family Cetorhinidae. It occurs circumglobally in temperate coastal shelf waters, and exists in Canada as two geographically isolated designatable units – Atlantic and Pacific. The species is vulnerable to incidental fishing mortality because of its low intrinsic productivity. Females do not mature until 16 to 20 years old, gestate between 2.6 and 3.5 years (the longest known gestation period for any vertebrate), and produce litters of only about 6 “pups”. These sharks are especially susceptible to entanglement in fishing gear and collision with boats because of their large size, surface behaviour and fearlessness around boats, and because their coastal distribution overlaps fishing and boating areas. Prior to 1970, large aggregations of these sharks were seasonally common in Pacific Canada, but only 6 sightings have been confirmed since 1996. This dramatic reduction in abundance is attributed to directed fisheries for liver oil (1941-1947) and an eradication program (until 1970) that killed hundreds, perhaps thousands of individuals between 1945 and 1970. The minimum historical population reconstructed from documented kills was at least 750 individuals, whereas the current population is virtually nil, implying a rate of decline exceeding 90% within < 2 generations. The species is believed to migrate seasonally between Canada and California, where regional aggregations were also severely depleted by historic fisheries. Rescue from outside Canada is unlikely.

Range Pacific Ocean

Status History

Designated Endangered in April 2007.

Nooksack Dace *Rhinichthys cataractae* ssp. **Endangered**

Assessment Criteria B1ab(iii,v)+2ab(iii,v)

Reason for Designation

The species is considered a habitat specialist dependent on stream riffles with loose, small grained substrates. This small fish is a representative of the Chehalis fauna, and considered to be a distinct subspecies of the longnose dace. It is known in Canada from only four locations in southwestern BC where its area of occupancy is severely limited, and subject to ongoing physical destruction of riffle habitat by urban, industrial and agricultural practices (e.g. dredging, channelization). Streams where the species is found are also impacted by lack of water in late summer due to ground and surface water extraction. Other activities have led to sediment accumulation in riffles caused by bank erosion resulting from gravel mining and/or runoff from urban storm drains, leading to further degradation of water quality and habitat.

Range BC

Status History

Designated Endangered in April 1996. Status re-examined and confirmed in May 2000 and April 2007.

Redside Dace *Clinostomus elongatus* **Endangered**

Assessment Criteria B2ab(i,ii,iii,iv,v)

Reason for Designation

This species is especially sensitive to stream alterations that interfere with flow regimes and lead to increased siltation and water temperatures. It has been lost from 5 of its 24 historic locations, and may now be gone from an additional 5; continuing decline is evident in 8 of the 14 remaining locations. More than 80% of the Canadian distribution occurs in the 'Golden Horseshoe Region' of southwestern Ontario where urban development poses the most immediate threat to the continued existence of this species in Canada. The 6 stable populations are on the fringe of urban development in watersheds that are, as yet, relatively undisturbed, but more than 50 % of these locations are in, or adjacent to, areas that are expected to be developed within the next 10 to 15 years.

Range ON

Status History

Designated Special Concern in April 1987. Status re-examined and designated Endangered in April 2007.

Bluntnose Sixgill Shark *Hexanchus griseus* **Special Concern**
Assessment Criteria not applicable

Reason for Designation

This large (maximum reported length 4.8 m), heavy-bodied shark is a benthic species that is widely distributed over continental and insular shelves in temperate and tropical seas throughout the world. In Canadian Pacific waters, it is found in inlets and along the continental shelf and slope typically at depths greater than 91 m (range 0-2500 m). In the absence of information about population structure, it is treated as a single population for assessment purposes. The present population size and abundance trends are not known. The only available abundance index, encounter rates with immature sharks at a shallow site in the Strait of Georgia, has decreased significantly (>90%) in the last five years. This index is not likely representative of the overall abundance trend because only immature sharks are encountered and the site is shallow relative to the preferred depth range. The principal known threat to the species is fishing. This shark has been the focus of at least three directed fisheries in Canadian waters, most recently in the late 1980's and early 1990s. It continues to be caught as bycatch, but survival of released sharks is unknown. Sharks observed by divers sometimes show scars from entanglement in fishing gear. Because of its late age of maturity (18-35 yr for females), it is likely susceptible to overfishing even at low levels of mortality. Little is known about the abundance and movement patterns of this species elsewhere in the world, so the potential for a rescue effect is unknown.

Range Pacific Ocean

Status History

Designated Special Concern in April 2007.

Longspine Thornyhead *Sebastolobus altivelis* **Special Concern**
Assessment Criteria not applicable

Reason for Designation

This slow growing rockfish has adapted to survive in deep waters where oxygen concentrations are minimal and productivity is low. Since the beginning of the fishery in the mid-1990s there has been an estimated decline in commercial catch per unit effort of over 50% in 8 years. Fishing is the primary and probably sole cause of this decline. While the fishery is managed by catch limits, and there is good monitoring of fishing activities, there is no management strategy in place that assures catches will be adjusted in response to abundance changes. The substantial decline in abundance indices over a short period taken together with the very conservative life history characteristics are cause for concern but commercial catch per unit effort may not reflect abundance changes accurately and there is potential for rescue from adjoining populations in the USA.

Range Pacific Ocean

Status History

Designated Special Concern in April 2007.

Northern Brook Lamprey *Ichthyomyzon fossor* **Special Concern**
Great Lakes - Upper St. Lawrence populations

Assessment Criteria not applicable

Reason for Designation

This nonparasitic lamprey is distributed in streams throughout the Great Lakes basin (except Lake Ontario) and in southwestern Quebec. In the Great Lakes basin, which comprises most of its range, about 50% of the streams it is known to inhabit are subjected to ongoing chemical treatment for sea lamprey control which causes mortality to its larval stage. However, in untreated streams, the species is still abundant.

Range ON QC

Status History

The species was considered a single unit and designated Special Concern in April 1991. When the species was split into separate units in April 2007, the "Great Lakes - Upper St Lawrence populations" unit was designated Special Concern.

Rougheye Rockfish type I	<i>Sebastes</i> sp. type I	Special Concern
<u>Assessment Criteria</u> not applicable		

Reason for Designation

This species is a relatively large (reaching 90 cm length) rockfish species and among the longest-lived, estimated to approach 200 years. It is one of two sympatric species which have been identified within the described species *Sebastes aleutianus*. It ranges from northern Japan to southern California in depths 200 to 800+ m along the shelf break. In Canadian waters abundance information is derived from surveys and from the commercial fishery that has maintained a relatively constant reported catch of between 1000 and 2000 tonnes annually over the last 2 decades. Abundance indices and biomass estimates are uncertain, compromised by short time series and survey techniques not always appropriate for the species. No strong abundance trends are observed in the available indices. There is evidence of truncation of the age distribution over the last decade, suggesting that mortality from all sources may have doubled ($4.5\% y^{-1}$ to $9.1\% y^{-1}$). Long-lived, low-fecundity *Sebastes* species are particularly susceptible to population collapse and recovery may be compromised when the age- and size-distribution is truncated (i.e. when the number of spawners decline) through fishing. Difficulty in separating the two species increases the risk of potential impacts on one of the species going unnoticed.

Range Pacific Ocean

Status History

Designated Special Concern in April 2007.

Rougheye Rockfish type II	<i>Sebastes</i> sp. type II	Special Concern
<u>Assessment Criteria</u> not applicable		

Reason for Designation

This species is a relatively large (reaching 90 cm length) rockfish species and among the longest-lived, estimated to approach 200 years. It is one of two sympatric species which have been identified within the described species *Sebastes aleutianus*. It ranges from northern Japan to southern California in depths 200 to 800+ m along the shelf break. In Canadian waters abundance information is derived from surveys and from the commercial fishery that has maintained a relatively constant reported catch of between 1000 and 2000 tonnes annually over the last 2 decades. Abundance indices and biomass estimates are uncertain, compromised by short time series and survey techniques not always appropriate for the species. No strong abundance trends are observed in the available indices. There is evidence of truncation of the age distribution over the last decade, suggesting that mortality from all sources may have doubled ($4.5\% y^{-1}$ to $9.1\% y^{-1}$). Long-lived, low-fecundity *Sebastes* species are particularly susceptible to population collapse and recovery may be compromised when the age- and size-distribution is truncated (i.e. when the number of spawners decline) through fishing. Difficulty in separating the two species increases the risk of potential impacts on one of the species going unnoticed.

Range Pacific Ocean

Status History

Designated Special Concern in April 2007.

Roughhead Grenadier***Macrourus berglax*****Special Concern**Assessment Criteria not applicableReason for Designation

This species is widespread on the upper continental slope and deep continental shelf throughout the North Atlantic. Females mature at 13-15 years with a generation time of approximately 20 years. The species is distributed from Davis Strait in the north to Georges Bank in the south, occurring both inside and outside 200 n. miles, primarily in depths between 400 and 1500 m. Research vessel surveys have not consistently covered deep portions of the range and catch a low proportion (ca. 2%) of mature adults. Canadian survey index decline rates over 15 years (< one generation) of > 90% occurred in the 1980s and early 1990s, but the surveys only covered depths to 1000 m. This decline is probably due to a combination of distributional change and abundance decline: there is evidence for movement of fish into deeper water as a result of the cooling of the shelf in the 1980s, and reduction in population size due to fishing pressure is also a possible factor. The species is caught primarily as bycatch in the Greenland halibut fishery, which has experienced reduced Total Allowable Catch and greater restrictions on areas of operation since 2000. However there are no catch limits or management plans for the species in Canadian waters, and catch reporting of foreign vessels is often unreliable. Survey indices (Canadian and European Union) for adults have been stable over the past decade. The species is of concern because of late maturation, lack of evidence of return of adults to shallower depths with return to environmental conditions prevailing prior to the 1980s, a probable decline in abundance in the 1980s and 1990s, and the lack of a management plan for directed and incidental harvest.

Range Atlantic OceanStatus History

Designated Special Concern in April 2007.

Tope***Galeorhinus galeus*****Special Concern**Assessment Criteria not applicableReason for Designation

This Pacific coast shark is thought to be highly migratory across its range from Hecate Strait, BC to the Gulf of California. It shows no evidence of distinct populations and thus for the purposes of this assessment is considered a single population. It feeds primarily on fish, and in Canada occupies continental shelf waters between western Vancouver Island and Hecate Strait. Maximum length is less than two meters, maximum age is at least 45 years, maturity between 12 and 17 years, and generation time 23 years. The species is noted for its high concentration of liver vitamin A, exceeding that of any other north-east Pacific fish. Demand for vitamin A during World War II led to a large fishery that quickly collapsed due to over-exploitation. More than 800,000 individuals, primarily large adults, were killed for their livers between 1937 and 1949 throughout its migratory range. This shark is rarely seen today in Canadian waters. There is no targeted commercial fishery in Canada, but it continues to be caught as fishery bycatch in Canada and the U.S., and remains the target of small commercial and recreational fisheries in the U.S. Because there is no population estimate, the sustainability of current catches cannot be assessed. The ongoing fishery mortality, the lack of a management plan for Canadian bycatch, and the long generation time and low fecundity suggest cause for concern.

Range Pacific OceanStatus History

Designated Special Concern in April 2007.

Big Skate *Raja binoculata* **Not at Risk**Assessment Criteria not applicableReason for Designation

The species is one of five species in the genus *Raja* that occur in Pacific Canada. Its global range extends from California to the Bering Sea. It is common in coastal waters throughout British Columbia. The species is treated as a single population in Canada in the absence of information indicating population structure. Like other elasmobranches, this skate is expected to have low intrinsic productivity, making it vulnerable to overexploitation. Generation time is estimated at 18 years; median age of maturity in females is 12 years; fecundity is low (typically on 3-4 eggs) and eggs are large requiring one year to develop; the interval between spawnings is unknown. Skates are killed in several commercial fisheries and recently a growing market may have stimulated some directed fishing effort. Management quotas now constrain catches in the hook and line fishery and for the trawl fishery in one area, where historically more than 50% of catches have been taken. The lack of regulation in other fishing areas remains a concern; however, no declining trends are evident in the most reliable surveys of abundance. Similarly, abundance is considered to be stable north of the Canadian range (Gulf of Alaska) and increasing south of the Canadian range.

Range Pacific OceanStatus History

Designated Not at Risk in April 2007.

Longnose Skate *Raja rhina* **Not at Risk**Assessment Criteria not applicableReason for Designation

A dorso-ventrally flattened fish, characterized by a long, pointed rostrum, inhabiting coastal and shelf waters ranging between 20 and 1000 m in depth from the Bering Sea south to the Gulf of California. Its life history is characterized by relatively late maturity (10 yr for females), large size at maturity (83 cm for females), and long generation time (20 yr). In the absence of information about population structure, it is treated as a single population for assessment purposes. Caught primarily as bycatch in both the hook and line and trawl fishery, the proportion of catches retained by the fishery has increased in recent years which may have resulted in increased fishing mortality, depending on the mortality rate of discarded individuals. However, survey data suggest that abundance has either remained stable or has increased since the early 1980s. North and south of its Canadian range, the species is either stable or increasing in abundance.

Range Pacific OceanStatus History

Designated Not at Risk in April 2007.

Sandpaper Skate *Bathyraja interrupta* **Not at Risk**Assessment Criteria not applicableReason for Designation

This species is one of 11 species of skate that inhabit Canada's Pacific waters. It is encountered on soft substrate bottoms at depths between 70 and 900 m, and ranges from the eastern Bering Sea and Aleutian Islands along the western continental shelf of North America to southern California. In Canada, it occurs along most of the continental shelf and in the southern Strait of Georgia. In the absence of any evidence of population structure, the species is treated as a single population for assessment purposes. This species is taken as bycatch in groundfish trawl and hook and line fisheries, and the market value for skate has recently increased. Abundance indices are highly variable, but groundfish research survey data indicate that abundance in Canadian waters has either remained stable or has increased since the early 1980s. Abundance is estimated to be stable or increasing in regions to the north and south of its Canadian range.

Range Pacific OceanStatus History

Designated Not at Risk in April 2007.

Black Buffalo *Ictiobus niger* **Data Deficient**
Assessment Criteria not applicable

Reason for Designation

It is not clear whether specimens with sub-terminal mouths recently collected from several locations in the lower Great Lakes are of this species or the closely related Smallmouth Buffalo. Reliable keys for identification of the species do not currently exist and are required in order to establish the eligibility of the species for assessment, and to determine the extent of its distribution in Canada.

Range ON

Status History

Designated Special Concern in April 1989. Species considered in April 2007 and placed in the Data Deficient category.

Blackfin Cisco *Coregonus nigripinnis* **Data Deficient**
Assessment Criteria not applicable

Reason for Designation

Uncertainty about whether or not we are dealing with ecomorphotypes of a common and widespread species (*C. artedii*) or distinct populations of Blackfin Cisco (*C. nigripinnis*) cannot be resolved with the information currently available. Given that uncertainty, COSEWIC cannot unambiguously define what unit it would be assessing. However, COSEWIC notes that whatever the systematic status, there are distinct coregonids in these lakes that warrant enhanced conservation and protection. The uncertainty of systematic status can probably only be resolved through a comprehensive taxonomic/systematic review of the sub-genus.

Range ON

Status History

Designated Threatened in April 1988. Species considered in April 2007 and placed in the Data Deficient category.

Brown Cat Shark *Apristurus brunneus* **Data Deficient**
Assessment Criteria not applicable

Reason for Designation

The species is the smallest shark found in Canadian Pacific waters and the only Canadian representative of the largest family of sharks (Scyliorhinidae). It is found in the eastern Pacific from southeastern Alaska south to California and possibly Panama, but is most abundant off California and Oregon. Although distributed throughout British Columbia waters, it is likely more common in waters off the southern part of the province. The species is treated as a single population in the absence of information indicating finer population structure. Adults are encountered on the bottom over soft mud or rocky reefs on the outer continental shelf at depths of 300-1000 m. There is no directed fishery but it is caught as bycatch in deepwater (>500 m) commercial trawling, where effort has declined since 2002 by over 80%. An index of abundance from that fishery indicates that the population is stable or increasing over the period 1996 to 2005, but interpretation of that trend is seriously confounded by the incorporation of unfished areas midway through the series and a change in catch reporting after the first three years. Both confounding factors could have masked declines in abundance. Several short duration research surveys have provided a minimum population estimate of about 25,000 individuals of all ages and confirmation that the species is widespread within deep waters (>500m) of the continental slope (it appears in 42% of trawls). However, the data series are too short and variable to provide an indication of status. A fishery-independent survey in southern US waters (California to Washington) indicates that the abundance of this species is stable. There is little biological information available that can be used to estimate vulnerability to potential threats. Reproduction appears to occur year-round. No age data are available but other small sharks in this family mature at less than 10 years. There is no information about size at maturity in Canadian waters but the projection of latitudinal trends in size at maturity suggests that as few as 4% of the females and 16% of the males would be mature. The only known threat to the species is fishing-related mortality, which has likely been diminishing in recent years as the deep-water trawl fishery effort has declined.

Range Pacific Ocean

Status History

Species considered in April 2007 and placed in the Data Deficient category.

Northern Brook Lamprey	<i>Ichthyomyzon fossor</i>	Data Deficient
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Saskatchewan - Nelson populationAssessment Criteria not applicableReason for Designation

This nonparasitic lamprey has not been the subject of any targeted and comprehensive survey since it was first reported from Manitoba in the late 1970s, and accordingly, the distribution and status of its populations are not well known.

Range MBStatus History

The species was considered a single unit and designated Special Concern in April 1991. When the species was split into separate units in April 2007, the "Saskatchewan-Nelson population" unit was designated Data Deficient.

Molluscs

Eastern Pondmussel	<i>Ligumia nasuta</i>	Endangered
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Assessment Criteria A2ce; B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v)Reason for Designation

This was one of the most common species of freshwater mussel in the lower Great Lakes prior to the invasion of the zebra mussel (*Dreissena polymorpha*) in the late 1980s. Zebra mussels attach to the shells of native freshwater mussels in the hundreds or even thousands, causing the native mussels to suffocate or die from lack of food. Over 90% of historical records for the species are in waters that are now infested with zebra mussels and therefore uninhabitable. The species has declined dramatically and now occurs as two small, widely separated populations, one in the delta area of Lake St. Clair and one in a tributary of the upper St. Lawrence River. There is evidence that declines may be continuing at one location. Although zebra mussels appear to be declining in some areas, their impacts on this species may be irreversible if insufficient breeding adults have survived. Climate change is likely to cause a drop in water levels in the delta and further reduce the amount of habitat available to the mussel. Recent surveys in Lake St. Clair, which were conducted as a collaborative effort between Environment Canada and the Walpole Island First Nation, resulted in the identification of a significant refuge for this species within First Nation territory. The refuge is being managed by the First Nation for the protection of this and other aquatic Species at Risk with which it co-occurs.

Range ONStatus History

Designated Endangered in April 2007.

Vascular Plants

Eastern Flowering Dogwood	<i>Cornus florida</i>	Endangered
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Assessment Criteria A3e+4ae; C1+2a(i)Reason for Designation

A small understory or forest-edge tree present only as small populations within the fragmented woodlots of southern Ontario's Carolinian forest. The spread of dogwood anthracnose disease has caused dramatic declines in the Canadian populations that reflect similar declines throughout the species' range in eastern North America. This assessment of risk applies only to wild populations and not to cultivated plants in nurseries, parks, and gardens.

Range ONStatus History

Designated Endangered in April 2007.

Ogden's Pondweed *Potamogeton ogdenii* **Endangered**
Assessment Criteria B1ab(ii,iii,iv)+2ab(ii,iii,iv)

Reason for Designation

This species is an aquatic plant that is globally at risk with low population numbers and only 11 extant sites known worldwide. In Canada, it is known from only 3 sites in southeastern Ontario where it was last collected in 1987. Recent fieldwork has documented the loss of habitat and probable extirpation of one population but failed to relocate the others – one of these is a historic site in a relatively undisturbed region with no specific locality information. The presence of aquatic invasive plants in areas around presumed extant populations suggests a further decline in overall area and quality of habitat for native pondweeds. However the species, which is easily confused in the field with other similar narrow-leaved pondweeds, may still be present in Canada in suitable habitats in the vicinity of previously known sites.

Range ON

Status History

Designated Endangered in April 2007.

Purple Spikerush *Eleocharis atropurpurea* **Endangered**
Assessment Criteria B1ab(ii,iii,v)c(iv)+2ab(ii,iii,v)c(iv); C2a(i,ii); D1

Reason for Designation

This species is an annual plant restricted to a single small site on a lakeshore where control of fluctuating lake levels may have reduced habitat availability. The population is very small and may be present in some years only in the seed bank. On-going shoreline use for recreational purposes and a proposed major development adjacent to the site, place the population at risk of extirpation.

Range BC

Status History

Designated Endangered in April 2007.

Blunt-lobed Woodsia *Woodsia obtusa* **Threatened**
Assessment Criteria Met criteria for Endangered, B2ab(ii,iii,iv,v), but designated Threatened, C2a(i), because most plants are in protected areas or undisturbed sites where recruitment is occurring.

Reason for Designation

A species with a highly fragmented distribution in Canada where it is known only from southeastern Ontario and southwestern Quebec at eight small localized sites. One additional population is now considered to be extirpated. The fern occurs almost exclusively on warm and relatively dry calcareous rocky slopes. The total Canadian population consists of fewer than 1400 mature plants. The primary threat is at the largest population due to the anticipated loss of habitat quality and decline in the fern population as a consequence of the presence and spread of an exotic invasive shrub. Most sites, however, are in protected areas or undisturbed sites where recruitment is occurring.

Range ON QC

Status History

Designated Threatened in April 1994. Status re-examined and designated Endangered in May 2000. Status re-examined and designated Threatened in April 2007.

Parker's Pipewort***Eriocaulon parkeri*****Not at Risk**Assessment Criteria not applicableReason for Designation

The species is an annual shoreline plant adapted to freshwater or slightly brackish intertidal waters within portions of the St. Lawrence River Estuary in Quebec and the estuary of the Miramichi River in New Brunswick. The species occupies a narrow shoreline zone of suitable habitat but is present at many sites and has several very large populations that are at limited risk within both regions of the species disjunct range in Canada.

Range QC NBStatus History

Designated Not at Risk in April 2007.

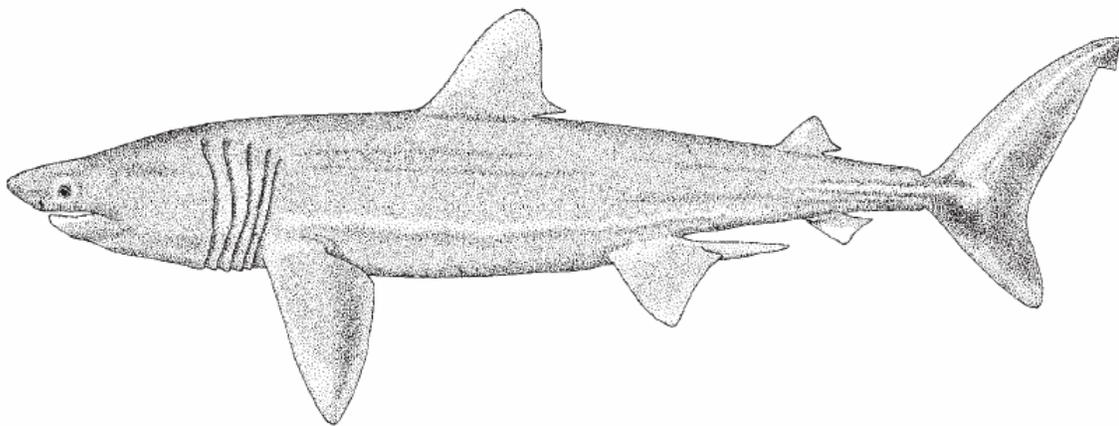
*The assessments of Lake Chubsucker (*Erimyzon sucetta*) and Canary Rockfish (*Sebastes pinniger*) were deferred. These species will be re-considered by COSEWIC in November 2007. The assessment of Basking Shark (*Cetorhinus maximus*), Atlantic population, was deferred to a later meeting to allow inclusion of additional information on population declines in the status report. Spalding's Milk-vetch (*Astragalus spaldingii*) was determined to be ineligible for assessment.

21/08/2007

APPENDIX XI

CANADIAN SPECIES AT RISK

September 2007



Aussi disponible en français

COSEWIC
COMMITTEE ON THE STATUS OF
ENDANGERED WILDLIFE
IN CANADA



COSEPAC
COMITÉ SUR LA SITUATION DES
ESPÈCES EN PÉRIL
AU CANADA

