

Invasive species and species at risk assessment in British Columbia

Eric B. Taylor¹ (Chair)

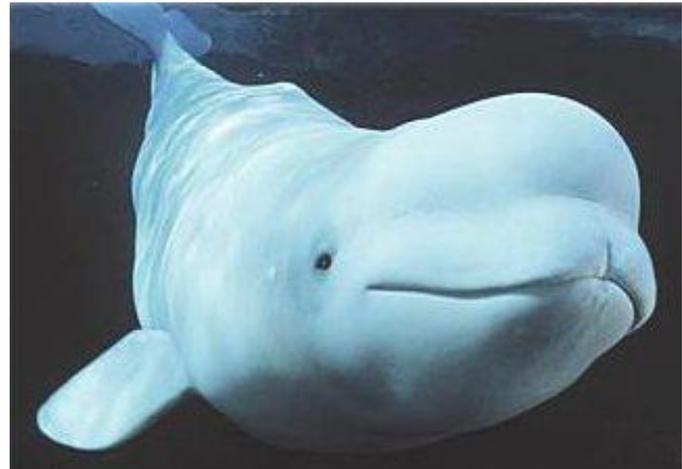
Committee on the Status of Endangered
Wildlife in Canada

(COSEWIC)



Outline

- 1. Background: What is COSEWIC and what does it do?**
- 2. Invasives: how do they fit into assessments?**
- 3. Invasives: patterns across taxa**
- 4. Conclusions**



Background

COSEWIC: Committee on the Status of Endangered Wildlife in Canada

-*independent* national science advisory body for species at risk (of extinction)

-established in 1977

-first assessments in 1978

-recognized legally in 2003 when *Species at Risk Act* proclaimed

-724 wildlife species assessed at risk (XT, EN, TH, SC) plus 15 extinct (April 2016, 970 total assessments)



Structure

31 votes:

4 Federal Government Departments/Bodies: DFO, PC, CMN, CWS

13 Provincial and Territorial Governments

3 Non-government Science Members

1 Aboriginal Traditional Knowledge Subcommittee

10 Species Specialist Subcommittees



Structure

Ten Species Specialist Subcommittees

Amphibians & Reptiles

Arthropods

Birds

Freshwater Fishes

Marine Fishes

Marine Mammals

Molluscs

Mosses & Lichens

Terrestrial Mammals

Vascular Plants



Structure

Independence of COSEWIC members:

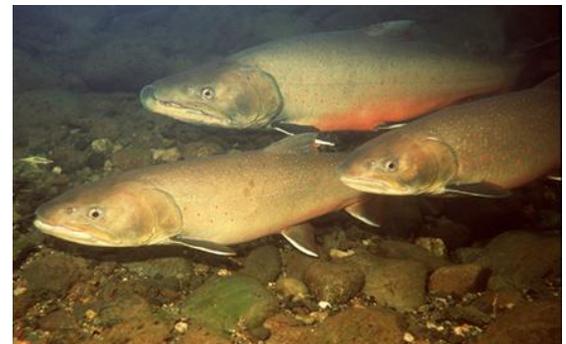
- Members do not represent governments, institutions, interest groups
- Assessments **are not** based on affiliation or socioeconomic consequences
- Assessments **are** based on the best available scientific, community and Aboriginal traditional knowledge



Roles

Primary Roles:

- Assess status of species that may be at risk and identify threats
- Review status every 10 years or when status may have changed
- Provide advice on status to Minister of Environment and Canadian Endangered Species Conservation Council
- Communicate assessment results and rationale to the public



COSEWIC Assessment Categories

Extinct

Extirpated

Endangered

Threatened

**Special
Concern**

Not at Risk

Data Deficient



Criteria

COSEWIC Assessment

Qualitative Criteria

Quantitative Criteria

**Extinct/
Extirpated**

**Special
Concern**

**Data
Deficient**

Threatened

Endangered

Assessment

Quantitative Assessment Criteria

Population reduction: A

Small distribution &
decline or fluctuation: B

Small population size
& decline: C

Very small or restricted
population: D

Quantitative analysis: E

Numerical
Thresholds:
Discussion

Species status

**How do invasive
species fit into
COSEWIC quantitative
and qualitative criteria?**

Invasives and the “A” criterion

Under population decline, taxon must meet numerical thresholds **based on** direct observation (a), index (b), habitat loss (c), exploitation (d), or **effects of invasives (e)**.

Figure 1
Commercial River Herring Landings



Invasives and the "A" criterion

A1: EN = > 70% decline, TH = > 50% (causes reversible, **and** understood, **and** ceased) over past 10 years or 3 generations, whichever is longer

A2: EN = > 50%, TH = > 30% (may not be reversible, or understood, or ceased)

A3: EN = > 50%, TH = > 30%, projected over the next 10 years or 3 generations, whichever is longer

A4: EN = > 50%, TH = > 30%, over any 10 year or 3 generation period including the past and future

Invasives and the "A" criterion

e.g., Enos Lake Benthic and Limnetic Threespine Sticklebacks (*Gasterosteus aculeatus*)

Endemic to Enos Lake, southwestern Vancouver Island

Currently assessed as EN under A1e

Reduction of > 70% over the past 10 years owing to the effects of invasive American signal crayfish (*Pascifasticus lenisculus*)



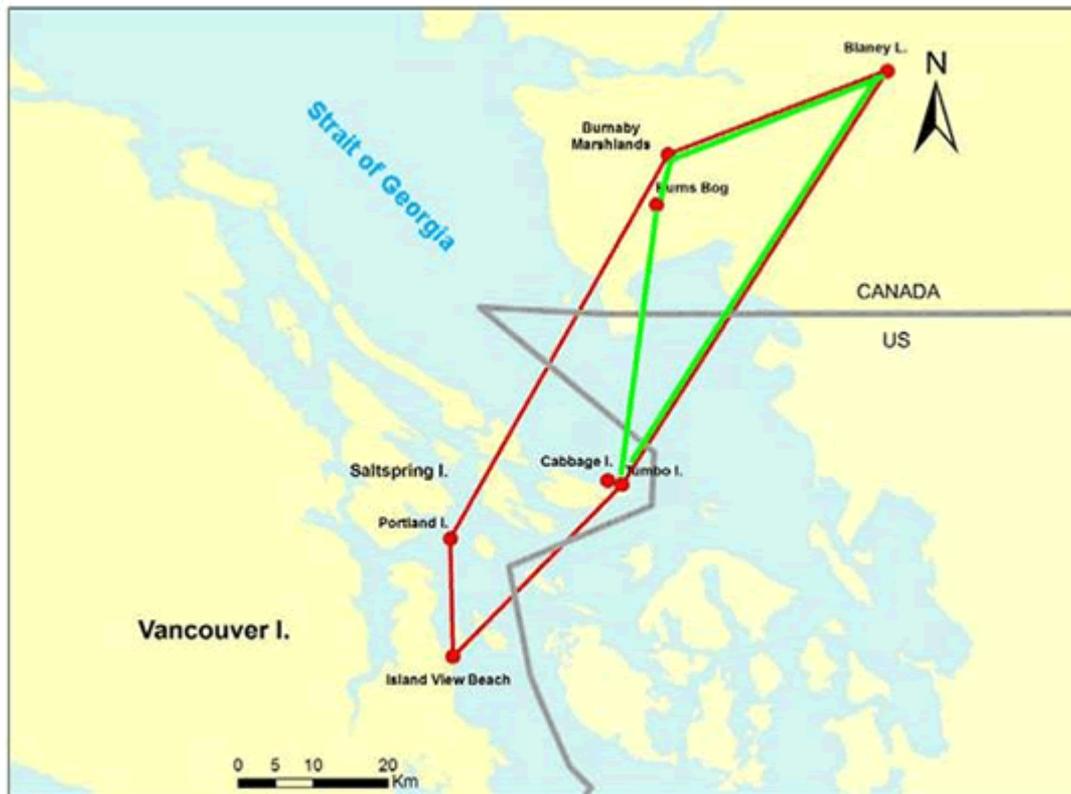
—
10mm



- breeding habitat destruction?
- altered food resources?
- predation?
- disrupt breeding behaviour?

Invasives and the "B" criterion

Small extent of occurrence (EEO, **B1**)
and/or index of area of occupancy
(IAO, **B2**)



Invasives and the “B” criterion

Small extent of occurrence (EEO, **B1**) and/or index of area of occupancy (IAO, **B2**), and

two of severely fragmented (**a**), or small number of locations (**b**), or extreme fluctuations, and

one of continuing decline in EEO (**i**), IAO (**ii**), area/quality of habitat (**iii**), number of locations (**iv**) or population size (**v**)

Invasives and the "B" criterion

Thresholds for B1 ($EN < 5,000 \text{ km}^2$, $TH = < 20,000 \text{ km}^2$)

Thresholds for B2 ($EN < 500 \text{ km}^2$, $TH < 2,000 \text{ km}^2$)

Thresholds for number of locations ($EN \leq 5$, $TH \leq 10$)

e.g., taxon: $EOO = 2,000 \text{ km}^2$, $IAO = 250 \text{ km}^2$, 3 locations, and inference of decline in habitat owing to invasive plants = EN under **B1a(iii)+B2a(iii)**

Invasives and the "B" criterion

Bearded Owl-clover, *Triphysaria versicolor*

southwestern Vancouver Island



EOO = 24km²

IAO = 24 km²

Locations = 5

Suffer extreme fluctuations in
Mature adults

Inferred continuing decline in
habitat amount and quality from
invasive, weedy plants
(competition, > 15 spp)

Assessed in 2011 as EN:

B1**b**(iii)c(iv)+B2**b**(iii)c(iv)

Invasives: other criteria and categories

C: Small population size and continuing decline (**from invasives?**)

D: Small area, number of locations and prone to stochastic effects (**from invasives?**)

Qualitative Assessment Categories

Special Concern: May become Threatened (from **effects of invasives?**)

Extirpated: Cause of extirpation and constraints to recovery **from invasives?**

Invasives: IUCN Threats' Calculator

Invasive species are also a major category used in assessing multiple threats using the IUCN Threats' Calculator spreadsheet

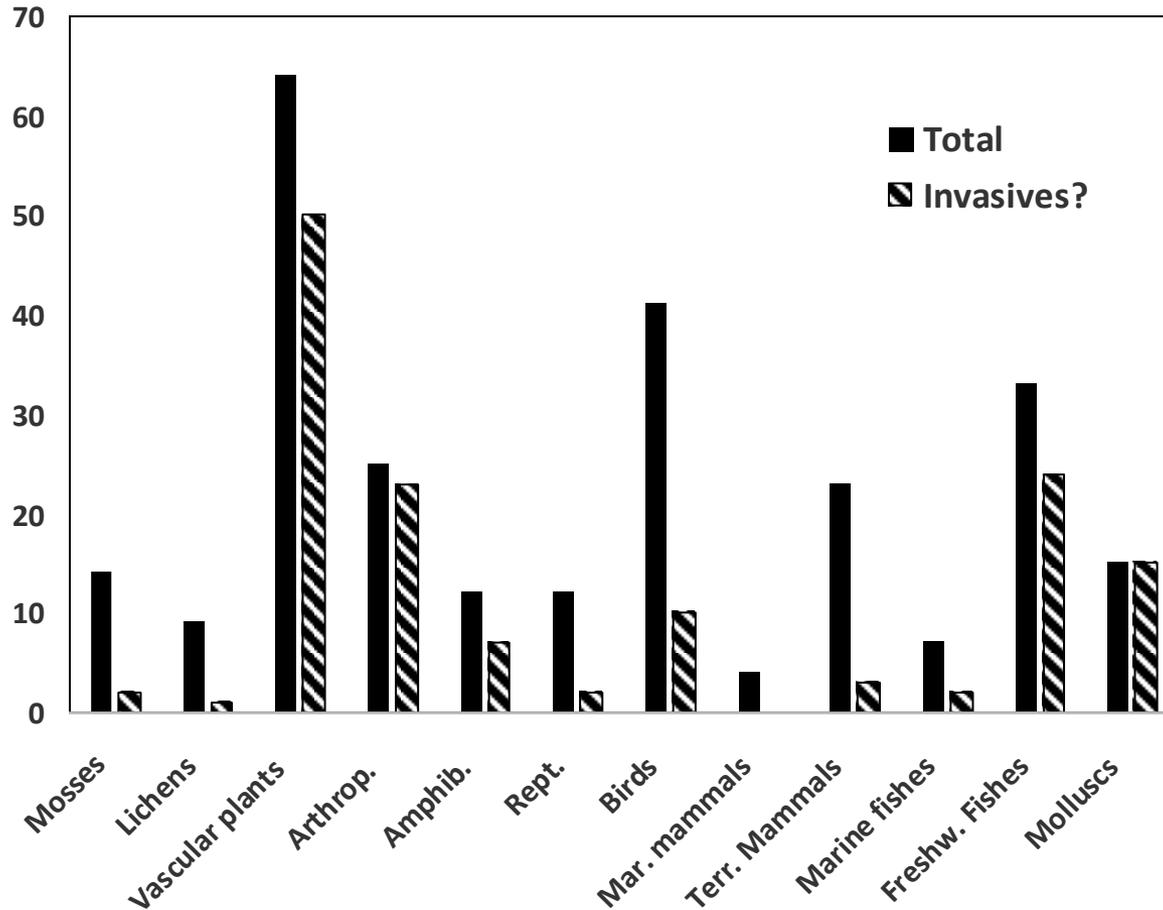
Scope, Severity, Impact

?

THREATS ASSESSMENT WORKSHEET			
Species or Ecosystem Scientific Name	<i>Hemphillia dromedaries</i>		
Element ID		Elcode	
Date (Ctrl + ";" for today's date):	2/11/2012		
Assessor(s):	Dave Fraser, Dwayne Lepitzki, Kristina Ovaska, Lennart Sopuck, Trudy Chatwin, Ross Vennesland, John Deal, Jenny Heron		
References:	Recovery Strategy 2008		
Overall Threat Impact Calculation Help:		Level 1 Threat Impact Counts	
		high range	low range
Threat Impact			
A	Very High	0	0
B	High	0	0
C	Medium	3	1
D	Low	4	6
Calculated Overall Threat Impact		High	High

Impacts of Invasives on Assessment Varies by Taxonomic Group

Number of species assessed as XT, EN, TH, SC



Number of species impacted by invasives

Taxonomic group
(BC species only)

Summary

1. COSEWIC roles and responsibilities
 2. Invasive species can feed into assessment in many ways
 3. Invasives impact many assessments, but vary by taxon
 4. Competition, predation, disease
- Transfer: chief processes



COSEWIC

Committee on the Status of
Endangered Wildlife in Canada



COSEPAC

Comité sur la situation des
espèces en péril au Canada