# Biodiversity Conservation in Canada: From Theory to PracticeBy R. Schneider

# Text Tables

****Table 3.1.** Values of nature held by Canadians**

|  |  |
| --- | --- |
| **Value Type** | **Examples** |
| **Utility values** |  |
|  Economic  | Rents from the sale of resources, employment, food, tourism |
|  Recreation | Bird watching, hiking, hunting, etc. |
|  Ecosystem services | Nutrient cycling, water filtration; pollination, etc. |
|  Aesthetic | Enjoyment and appreciation of the beauty of nature |
|  Research/Education | Learning about and understanding natural systems |
| **Intrinsic values** |  |
|  Moral/ethical | The right of species to exist and be valued for their own sake |
|  Heritage | Passing on a healthy environment to next generation |

Table 3.2. Overview of national ENGOs that engage in conservation activities in Canada, ranked by annual revenue.1

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Organization** |  **Revenue (millions)** |  |  **Staff** | **Origin** | **Focus** |
| Ducks Unlimited Canada3 | 110.2 |  | 521 | 1938 | Wetland protection |
| Nature Conservancy3 | 83.3 |  | 313 | 1962 | Land trust |
| WWF Canada3 | 22.0 |  | 136 | 1967 | Wildlife conservation |
| Can. Wildlife Federation | 19.0 |  | 82 | 1962 | Wildlife conservation |
| Greenpeace3 | 11.4 |  |  | 1971 | Multi-faceted |
| David Suzuki Foundation | 10.1 |  | 97 | 1990 | Multi-faceted |
| Ecojustice | 6.4 |  | 55 | 1990 | Environmental law |
| Bird Studies Canada | 5.0 |  | 83 | 1967 | Wildlife research |
| CPAWS | 4.8 |  | 60 | 1963 | Wilderness preservation |
| Wildlife Conserv. Society | 3.3 |  | 21 | 2004 | Wildlife research |
| Environmental Defence  | 2.7 |  | 33 | 1984 | Multi-faceted |
| Wilderness Committee | 2.3 |  | 28 | 1980 | Wilderness preservation |
| Nature Canada4 | 2.0 |  | 15 | 1939 | Naturalist clubs |
| Sierra Club Canada4 | 1.8 |  | 46 | 1969 | Multi-faceted |
| Trout Unlimited | 1.6 |  | 14 | 1972 | Stream protection |
| Wildlife Preservation Canada | 1.5 |  | 35 | 1985 | Wildlife conservation |
| Stand.earth3 | 1.0 |  |  | 2000 | Multi-faceted |
| 1Data obtained from Canada Revenue Agency charity listings, downloaded Oct. 2018 from http://www.cra‐arc.gc.ca. |
| Staff includes part‐time employees. |
| 2For international groups, the information provided here refers to Canadian operations only.3Information is for the national office and the BC chapter. |

**Table 5.1. The general status of wild species in Canada in 2015.1**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Group** | **Secure** | **Vulnerable** | **Imperiled** | **Critical** | **Extirpated** | **Alien** | **Unranked2** |
| Fish | 434 | 54 | 25 | 9 | 4 | 15 | 838 |
| Amphibians | 30 | 9 | 5 | 2 | 1 | 0 | 1 |
| Reptiles | 14 | 15 | 6 | 5 | 4 | 2 | 3 |
| Birds | 347 | 48 | 14 | 26 | 4 | 10 | 229 |
| Mammals | 136 | 31 | 10 | 11 | 2 | 12 | 20 |
| Plants3 | 2,689 | 467 | 325 | 315 | 50 | 1,315 | 50 |

1Source: CESCC, 2016.

2Species that occur as infrequent migrants to Canada or for which information is lacking.

3Vascular plants, including flowering plants, cone-bearing trees, ferns, and horsetails

**Table 5.2.** The annual rate of permanent deforestation in Canada, by sector, for 2015.1

|  |  |
| --- | --- |
| **Sector** | **Area (ha)** |
| Agriculture | 12,300 |
| Forestry | 1,400 |
| Mining | 3,200 |
| Municipal | 3,200 |
| Oil and gas | 9,800 |
| Transportation | 1,900 |
| Other | 2,300 |
| **Total** | **34,100** |
| 1Source: CFS, 2017.   |

**Table 7.1.** Forest attributes commonly used to characterize the ecological reference state under the natural disturbance model.1

|  |  |
| --- | --- |
| **Category** | **Attributes** |
| Stand composition  | Stand area by type and age class2 |
| Stand structure for early, mid, and late successional stages | Disturbance legacy (remaining live trees, standing  |
| dead trees, and snags) |
| Amount of coarse woody debris on the forest floor |
| Presence of canopy gaps  |
| Uniformity of tree ages within a stand  |
| Landscape Patterns | Distribution of stand size |
|  | Stand shape and spatial arrangement, including the level of fragmentation  |
|  | Spatial distribution of old-growth stands and special features such as riparian zones |
| Ecological processes  | Hydrologic function, including stream flow, turbidity, and connectivity3 |
| Human disturbances with no natural analog | Roads, mines, well-sites, hydroelectric dams, etc. |

1In larger study areas, the attributes shown here may be stratified by regional ecosystem type.

2Stand type is based on dominant vegetation and is used as a coarse-filter proxy for overall stand composition. 3Disturbance and succession are captured through the stand structure and pattern attributes. Other
 ecological functions are not commonly measured because of practical constraints.

**Table 10.1.** A simplified SDM consequence table for caribou management.

|  |  |  |  |
| --- | --- | --- | --- |
| **Objective** | **Approach A** | **Approach B** | **Approach C** |
| 1. Caribou viability | Outcome A1 | Outcome B1 | Outcome C1 |
| 2. Timber harvest | Outcome A2 | Outcome B2 | Outcome C2 |
| 3. Indigenous hunting | Outcome A3 | Outcome B3 | Outcome C3 |

**Table 10.2.** The consequence table used in the whooping crane reintroduction example.1 Source: Converse et al. 2013.

|  |  |  |
| --- | --- | --- |
| **Objectives** | **Best** | **Worst** |
| Population Viability2 | 0.289 | 0.122 |
| Diverted Chicks3 | 30 | 50 |
| Internal Cost (million $) | $9.95 | $11.10 |
| Partner Cost (million $) | $4.29 | $2.86 |
| Public Relations (0 or 1) | 1 | 1 |
| Information4 | 0.927 | 0.701 |
| Weighted Score | 0.657 | 0.320 |
| 1Only the best and worst performing alternatives in the case study are shown.2A weighted index of population viability based on multiple modelling methods.3The number of chicks available for use in other reintroduction projects.4Based on a formal value of information analysis.  |

Table 11.2. Biodiversity indicators used in the draft Biodiversity Framework.

|  |  |
| --- | --- |
| **Category**  | **Indicator** |
| Terrestrial Habitat | Percent of upland area free of human footprint |
|  | Amount of old-growth forest |
|  | Percent of upland area that is at least 50 m from human footprint |
| Aquatic Habitat | Percent of wetland area free of human footprint |
|  | Amount of undisturbed fen cover |
|  | Stream connectivity |
| Terrestrial Biodiversity  | Terrestrial biodiversity intactness index |
|  | Woodland caribou |
|  | Non-native plants |
| Aquatic Biodiversity  | Aquatic biodiversity intactness index |
|  | Arctic grayling |
|  | Walleye |