



Ducks Unlimited Canada
CANADA'S CONSERVATION COMPANY

NATURAL VALUES: *Linking the Environment to the Economy*

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BIODIVERSITY

Natural Values: Linking the Environment to the Economy was developed by Ducks Unlimited Canada (DUC) to improve the environmental and economic understanding of natural systems. In Canada, policy, legislation and regulation efforts must accelerate to protect our important resources. To view other installments in this series, visit www.ducks.ca/consERVE/wetland_values/consERVE.html



BIODIVERSITY IS THE VARIABILITY FOUND IN AND AMONGST LIVING ORGANISMS. The term biodiversity is most often used to refer to the number of species of plants, animals and microorganisms present in a given area, but it also describes genetic variation within a species and ecosystem diversity. We rely on biodiversity to provide us with a number of essential ecological goods and services including food, waste treatment, climate regulation and clean air and water. We also benefit economically from biodiversity – fisheries, forestry and wildlife-related recreation are an integral part of our Canadian economy. Despite our dependence on biological resources, human activities are altering natural areas and rapidly decreasing levels of biodiversity. Species extinction is now occurring at least 100 times faster than the historical rate. In Canada, there are currently 487 species at risk, 22 species that are no longer found in the country but still exist elsewhere, and another 13 species that are extinct. Habitat loss and degradation caused by human activity is the principal cause of species endangerment and declining biodiversity in Canada.

Wetlands are home to over 600 species of plants and animals and are second only to rainforests in the level of biodiversity that they harbour. Unfortunately, up to 70% of Canada's wetlands have been lost in the settled areas of Canada.



Environmental Values

Biodiversity underlies the production of countless essential ecological goods and services. These goods and services fall into a number of categories:

- **Supporting services** are necessary for the production of all other ecological goods and services. They include soil formation and retention, production of oxygen, nutrient and water cycling and biomass production.
- **Regulating services** are the benefits obtained from the regulation of ecosystem processes, and include pollination, storage and sequestration of carbon, climate regulation, pest and disease regulation, water purification and waste regulation.
- **Provisioning services** provide us with ecosystem products, and include the retention and storage of freshwater, production of food and raw materials and provision of medicines and substances used in pharmaceuticals.



Economic Values

When biodiversity is lost there is a financial cost incurred by society to replace the ecological goods and services that it provided, such as:

- ① Increased costs for agricultural production
- ② Decreased revenues from fisheries, forestry and wildlife-related recreation
- ③ Increased water treatment costs
- ④ Increased illness and health care costs
- ⑤ Decreased revenues from tourism activities associated with healthy ecosystems
- ⑥ Decreased property value due to degraded aesthetic qualities

Since no life, including our own would exist without the goods and services provided by biological resources, those resources can be considered priceless. Biological diversity is essential for human food, clean water, shelter, health, work, recreation and culture.

— *Caring for Natural Environments: A Biodiversity Action Plan for Saskatchewan's Future*, Government of Saskatchewan, 2004¹

DUC Recommends That:

- **Canadians** educate themselves on the importance of biodiversity and the ecological goods and services it provides. Become active with an organization that conserves and restores natural areas and biodiversity.
- **Educators** recognize and incorporate the environmental and economic values of biodiversity into their science, social studies, geography, and economics curricula.
- **Non-governmental organizations** fund and deliver programs that conserve and restore natural areas and biodiversity.
- **Governments** fund biodiversity research and programming; develop policies and legislation to protect natural areas and biodiversity; provide incentives for those who protect natural areas and biodiversity.

What's Next? Fact Sheet 6: Wetlands

Important Links

- www.ducks.ca/conserve/wetland_values/conserve.html
- www.ducks.ca/aboutduc/news/archives/2004/041115.html

Endnotes

- 1 Government of Saskatchewan. 2004. *Caring for Natural Environments: A Biodiversity Action Plan for Saskatchewan's Future*. Accessed February 2006 at: www.se.gov.sk.ca/ecosystem/FINAL_BAP_May_12.pdf.
- 2 Anielski, M. and S. Wilson. 2005. *Counting Canada's Natural Capital: Assessing the Real Value of Canada's Boreal Ecosystems*. Published by the Canadian Boreal Initiative and The Pembina Institute. 78 pp.
- 3 Government of Canada. 2003. *Canada and Freshwater – Experience and Practices*. Accessed September 2005 at: www.sdinfo.gc.ca/reports/en/monograph6/wateruse.cfm.
- 4 Fisheries and Oceans Canada. 2005. Statistical Services. Accessed February 2006 at: www.dfo-mpo.gc.ca/communic/statistics/commercial/landings/freshwater/2003_e.htm.
- 5 Costanza et al. 1997. The Value of the World's Ecosystem Services and Natural Capital. *Nature* 387: 253-260.
- 6 Myers, N. 1997. Biodiversity's Genetic Library. *Nature's services: societal dependence on natural ecosystems*. G. C. Daily. Washington D.C., Island Press: 255-273.
- 7 Olewiler, N. 2004. *The Value of Natural Capital in Settled Areas of Canada*. Published by Ducks Unlimited Canada and the Nature Conservancy of Canada. 36 pp.



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The Value of Biodiversity in Canada

The pest control services provided by birds in Canada's boreal forest have been estimated to be worth \$5.4 billion/year.²

Each year, approximately four million people participate in recreational fishing in Canada, producing an annual revenue of \$4.4 billion.³

In 2003, the Canadian commercial freshwater fishery produced revenue of \$83.7 million.⁴

The value of non-timber forest products (mushrooms, berries and wild rice) in Canada's boreal forest has been estimated to be at least \$79 million/year.²

The global value of pollination services provided by animals in grasslands, rangelands and croplands has been estimated at \$117 billion/year.⁵

One quarter of pharmaceuticals, including antibiotics, analgesics and tranquilizers, are derived from plants. The value of each plant-based drug to society has been estimated at \$449 million.⁶

Expenditures related to wildlife viewing in British Columbia's Lower Fraser Valley are estimated to generate revenue of \$53/ha/year.⁷