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The Protection of Endangered Species: A Canadian Perspective

Hajo Versteeg†

INTRODUCTION

If the land mechanism as a whole is good, then every part is good, whether we understand it or not. If the biota, in the course of aeons, has built something we like but do not understand, then who but a fool would discard seemingly useless parts? To keep every cog and wheel is the first precaution of intelligent tinkering.¹

In 1741, a Russian sailing crew found a strange cowlike sea mammal in the Bering Sea. The sailors killed one of the magnificent 10 ton creatures to supplement their monotonous diet. Other crews followed suit; by 1768, the newly-discovered Steller’s sea cow was extinct.²

Extinction³—the eradication of a species—has been a biological fact ever since life began some 3.5 billion years ago. Indeed, at least 90 percent of all species that have existed on earth are now extinct.⁴

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3. See infra note 93 and accompanying text for the definitions of the terms “threatened,” “endangered,” “extirpate,” “extinct,” and “rare.” The terms “vulnerable” and “jeopardized” are used interchangeably in this paper, and define a species that is rare, threatened, or endangered. Unless the context indicates otherwise, the term “wildlife” means any species of flora or fauna.

Charles Darwin recognized the dynamics of species extinction when developing his theory of evolution in the mid-1850s. In *The Origin of the Species* he noted that "as new forms [of species] are continually and slowly being produced, unless we believe that the number of specific forms goes on perpetually and almost indefinitely increasing, numbers inevitably must become extinct." Why then, if extinction is a natural evolutionary process, should one be concerned about the disappearance of a species?

The significance of modern species extinction does not reside in the fact of its occurrence, but rather in its rate and causation. At the end of the Mesozoic Era (65 million B.C.), characterized by scientists as "the great dying," a large number of terrestrial and marine animals, including dinosaurs, were disappearing at the rate of one species every 1,000 years. While paleontologists continue to debate the reasons for the great dying, it clearly involved a process of natural selection. Since the arrival of *Homo sapiens* 50 million years later, the rate of species extinction increased markedly. By the Middle Ages, extinction resulting from human intervention in the environment began to accelerate enormously. Between 1600 and 1900, as humans learned to kill more efficiently, species were lost at a rate of one every four years. From 1900 to 1975 the disappearance rate of species increased to about one per year. Today biologists estimate that humankind is destroying one to three species per day, primarily through habitat destruction. Some biologists predict that by the late 1980s the rate will accelerate to one per hour.

During the past 400 years the primary cause for species extinction has shifted from over-exploitation to habitat destruction. The *Global 2000 Report* estimates that by the year 2000 "between half a million and 2 million species—15 to 20 percent of all species on earth—could be extinguished...mainly because of loss of wild habitat." In short,

6. MYERS, THE SINKING ARK, supra note 4, at 4; EHRLICH, EXTINCTION, supra note 4, at 28.
7. EHRLICH, EXTINCTION, supra note 4, at 28-29.
9. Id. See also CEQ 1980 REPORT, supra note 2, at 31.
11. Indeed, "indirect" methods of habitat destruction are "by far the deadliest means by which humanity has pushed other organisms to extinction." EHRLICH, EXTINCTION, supra note 4, at 128. See generally id. at 129-76 (for examples of activities which indirectly destroy habitats and contribute to the extinction of wildlife).
humankind will destroy or modify enough habitat in the next 25 years to eradicate many more species than evolution has culled in the past 3.5 billion years.

The purpose of this paper is to provide interest groups and politicians with guidelines for drafting legislation which will protect vulnerable species of flora and fauna and support the principle of biological diversity. Legislators will be moved to enact rigorous conservation measures to combat the modern tragedy of species extinction only when convinced of the merits of preserving endangered species. Therefore, Part I of this paper comprehensively outlines the utilitarian and philosophical benefits derived from promoting biological diversity.

Effective preservation statutes are moot if species are not actually in need of protection. Part II provides definitions used in classifying vulnerable species, evaluates the current status of jeopardized species throughout Canada and in the province of New Brunswick, and underscores the need for direct contact with scientists doing local field work on species dynamics.

The most effective way to protect vulnerable species and to encourage biological diversity is to pass legislation dealing exclusively with these concerns. In Canada, constitutional principles determine that each provincial government has primary jurisdiction over wildlife within its borders. New Brunswick is the only province in Canada which has both an Endangered Species Act and an Ecological Reserves Act. Part III examines these statutes and similar enactments in other jurisdictions to assess their effectiveness. Based on this critique, Part III also proposes guidelines for legislation to protect endangered species and promote biological diversity.

The final section summarizes the findings of this study. It is hoped that detailing the need for a rational legislative approach to species conservation will prompt legislators to enact or amend their statutes to ensure the protection of vulnerable flora and fauna from extinction.

I
THE VALUE OF ENDANGERED SPECIES

Two broad categories of arguments favor the protection of species threatened with extinction: the first urges that biological diversity gives rise to utilitarian benefits, while the second maintains that all living organisms have a right to existence.

A. Utilitarian Benefits of Species Diversity

1. Food Sources

By the year 2000, the world's population is expected to have increased by more than 50 percent. At the same time, projected per capita world food production will grow by less than 15 percent. Land destined for cultivation is not expected to increase by more than 4 percent because most good land is already being utilized. Therefore, sharply rising world food demands will require increasing crop yields per hectare. The current dependence of farmers on fertilizers, pesticides and farm machinery to increase food production is, however, unpredictable. All of these agricultural techniques are vulnerable to fluctuations in the supply and price of nonrenewable fossil fuels.

Many scientists are now convinced that increased food production depends upon biological diversity. An abundant supply of a variety of genetic types is considered critical for producing new foods and developing high-yield food production. Techniques such as gene-splicing, crossbreeding, and hybridization rely on genetic diversity to improve agricultural yields.

A few examples involving rare species illustrate the value of promoting biological diversity to alleviate world food shortages. *Zea diploperennis* is a rare Mexican tall grass closely related to corn (*Zea mays*). Only a few thousand of these plants have been discovered, on an isolated mountain range currently zoned for commercial development. Corn must be planted every year and is prone to virus attacks; *Z. diploperennis*, by contrast, is perennial and virus-resistant. If geneticists can develop the most desirable traits from both plant species into a perennial, virus-resistant corn hybrid, the agricultural value of corn gene pools will be increased by billions of dollars.

Another rare species of flora offers promise for reducing the amount of fresh water needed to irrigate crops. Scientists have recently

17. *Id.* at 1-2. According to this report the per capita consumption will increase in countries that already have relatively high levels of consumption (e.g. Japan and the United States); in less developed countries scientists predict that the per capita consumption will scarcely improve or decline. *Id.* at 17.
crossed the commercial tomato with an inedible, salt-tolerant wild tomato found only on the Galapagos Islands. The edible, reportedly delicious hybrid can be irrigated using 70 percent sea water. This development is particularly important since the shortage of fresh water available for irrigation is one of the most pressing agricultural problems today.

Other examples abound. Cattle-bison hybrids (beefalo) reach market weight 50 percent faster, and reputedly produce meat costing 25 to 40 percent less than purebred cattle. Geneticists saved the Cornish chicken from extinction by crossing it with other breeds to produce the modern, fast-growing broiler chicken. A crossbred strain of wild wheat from Turkey gave American wheat a resistance to a series of diseases. The value of this single genetic improvement is an estimated $50 million annually.

These examples illustrate the multiple rewards obtained from the innovative use of rare species to increase food production. Yet scientists have systematically researched only a very few species. Until this research is concluded, no one can predict which species will provide material benefits. The American Council on Environmental Quality in its 1980 Annual Report concluded that the "employment of the earth's reservoir of biological diversity to increase [food] yields and develop new and pest-resistant crops is essential to the billions of humans who need to to be fed." The destruction of a species before researchers have fully explored its potential as a food source is an unthinkable waste of our natural resources with far-reaching implications.

2. Pharmacological Enrichment

Animal, plant and microbial species currently provide incalculable benefits to human health. Among other things, the pharmacologically active ingredients in these species are used in chemotherapy, and as heart drugs, analgesics, antibiotics, anticoagulants and hormones. Approximately 50 percent of all prescriptions written in the United States contain naturally derived ingredients. The commercial value of all plant medicines (prescription and non-prescription) for the

23. Id. at 34-35.
24. Id. at 67.
25. Id. at 66.
26. MYERS, THE SINKING ARK, supra note 4, at 68.
27. Altschul, supra note 21, at 96; CEQ 1980 REPORT, supra note 2, at 34; EHRlich, Extinction, supra note 4, at 62-69.
28. CEQ 1980 REPORT, supra note 2, at 34.
29. Id. at 34.
30. See CEQ 1980 REPORT, supra note 2, at 37-38; EHRlich, Extinction, supra note 4, at 54-61; MYERS, THE SINKING ARK, supra note 4, at 68-72; Altschul, supra note 21, at 96-104.
31. MYERS, THE SINKING ARK, supra note 4, at 68-69.
United States in 1980 was estimated conservatively at over $6 billion.\textsuperscript{32}

The American National Cancer Institute is presently conducting one of the most intensive pharmacological investigations ever undertaken on flora and fauna.\textsuperscript{33} In addition to examining microbial fermentation and marine organisms, the Institute has screened 25,000-35,000 higher plant species in search of new chemicals for curing disease. Approximately 3,000 of the plant species have shown some potential in treating cancer, and 15 have all the necessary characteristics for clinical (human) trials. The Institute hopes that at least five will warrant commercial development in the near future.\textsuperscript{34} Currently, two alkaloids, vincristine and vinblastine, extracted from the leaves of a periwinkle plant originally found in Madagascar, have proven effective in suppressing a variety of cancers. In 1976, world-wide sales of vincristine totalled $22 million; by 1979 this figure had risen to $35 million.\textsuperscript{35}

Furthermore, a variety of species offer enormous indirect advantages in medical research. Animal physiology can provide researchers with invaluable information concerning the nature and potential cures of many human maladies.\textsuperscript{36} The sophisticated heart and circulatory system of long-flying birds, such as the stormy petrel, the albatross and the hummingbird, offer clues to many human cardiovascular ailments.\textsuperscript{37} The blood clotting problems of the endangered Florida manatee may assist in hemophilia research.\textsuperscript{38} The remarkable tolerance of the rare desert pupfish to salinity extremes can aid research into human kidney disorders.\textsuperscript{39} In addition, a variety of animals are used to study the potential toxicity of chemicals released into the human environment.\textsuperscript{40}

Despite these immense benefits, medical researchers have examined only a minute fraction of the world’s species for pharmacological reward.\textsuperscript{41} To date, scientists have tested two percent of the world’s 300,000 flowering plants for life-saving alkaloids.\textsuperscript{42} The National Cancer Institute’s research program has only screened about 10 percent of

\begin{itemize}
  \item \textsuperscript{32} EHRLICH, Extinction, supra note 4, at 58.
  \item \textsuperscript{33} MYERS, The Sinking Ark, supra note 4, at 72 (flora); CEQ 1980 Report, supra note 2, at 37-38 (fauna).
  \item \textsuperscript{34} MYERS, The Sinking Ark, supra note 4, at 72; CEQ 1980 Report, supra note 2, at 37-38.
  \item \textsuperscript{35} MYERS, The Sinking Ark, supra note 4, at 72; EHRLICH, Extinction, supra note 4, at 53.
  \item \textsuperscript{36} MYERS, The Sinking Ark, supra note 4, at 69-70.
  \item \textsuperscript{37} \textit{Id.}
  \item \textsuperscript{38} \textit{Id.}
  \item \textsuperscript{39} \textit{Id.}
  \item \textsuperscript{40} \textit{Id.}
  \item \textsuperscript{41} \textit{Id.} at 57; Altschul, supra note 21, at 96.
  \item \textsuperscript{42} MYERS, The Sinking Ark, supra note 4, at 72.
\end{itemize}
these plant species for potential anticancer activity. Indeed, scientists consider marine organisms an untapped source of wealth for the study and treatment of human disease.

The key to using flora and fauna for medical reward lies in biological diversity. It is an accepted scientific premise that pharmacologically interesting chemicals occur most commonly in species-rich communities. Further, it is essential to preserve diverse species until scientists can thoroughly analyze them to determine their potential medical value. The indiscriminate elimination of a species precludes forever its use in medical research.

3. Industrial and Energy Uses

Current industrial demand for a wide assortment of raw materials, including wood, latex, fabrics, dyes, food flavorings, toiletries, glues and lubricants, is supplied directly by plant and animal species. As expanding human populations strain diminishing resources, new sources for raw materials must be discovered. Biological diversity will play a critical role in satisfying these needs.

The heavy demand for lubricants illustrates the value of promoting species diversity to help feed industry's insatiable appetite. The United States Department of Agriculture recently screened 6,400 plants in search of cheap, local alternatives to imported petroleum lubricants, and isolated over 460 plants for further study. Among these plants the Jojoba shrub found in northern Mexico and southwestern United States has particularly exciting potential. This shrub is the only known plant that yields a liquid wax. Industry traditionally relied on sperm whale oil for its liquid wax because scientists have not been able to reproduce its desirable characteristics synthetically. However, when the sperm whale was placed on the endangered species list in 1970, the annual importation of 50 to 55 million tons of its oil into the United States was abruptly halted. Aside from its potential value in replacing sperm whale oil, the Jojoba plant has been successfully used in the manufacture of an eclectic assortment of products, including linoleum, ink, chewing gum, adhesives, disinfectants, detergents, corrosion inhib-
itors, shampoo, lipstick, sunscreen compounds and polishes. In 1979, Jojoba oil sold for $3,000 a barrel in Japan. Projected world demand for the oil is expected to give rise to a $250 million industry. Because the shrub grows on marginal arid land, it would not interfere with the development of other agricultural products.

The potential of a variety of plant species to produce inexpensive, immediate and local alternatives to current energy resources is also well documented. Thus, maintenance of genetic diversity in the plant kingdom is a critical concern.

4. Monetary Benefits

The boundless contrasts of nature, highlighted by myriad variations in species composition, color, shape, texture, smell and sound, feed a primal instinct to search out the beautiful and the arcane. Since time immemorial, artists and scholars have repeatedly scrutinized nature's facets in art, literature, philosophy, religion and science. Perhaps the theory which suggests that all living matter shared a single kinship some 3.5 billion years ago explains the insatiable desire of so many people to photograph, hunt, study, collect or read about living things.

The economic benefits derived from these pursuits are enormous. In 1982, Statistics Canada conducted a comprehensive survey, sponsored by federal, provincial and territorial government wildlife agencies. It concluded that Canadians spent an estimated $4.2 billion on wildlife-related activities in 1981. One out of every five Canadians made a special trip for the primary purpose of observing, photographing, feeding or studying wildlife, spending a total of $2.1 billion in these pursuits. One out of every ten Canadians hunted wildlife, and the total spent $1.2 billion on this activity. The economic benefits may be even greater than the survey indicates, since the definition of wildlife used precluded any examination of the value of fishes and

52. Id.
53. Id. at 75.
54. EHRlich, EXTINCTION, supra note 4, at 74.
56. CEQ 1980 REPORT, supra note 2, at 38.
58. CWS, 1981 NATIONAL WILDLIFE SURVEY, supra note 57, at [i] (Summary).
59. Id.
60. Id.
flora. In addition, no attempt was made to quantify monetarily the intangible, emotional and psychological enrichment of people exploring wildlife.

The huge sums of money expended on wildlife-related activities reveal that Canadians value wildlife resources highly. More than 80% of those surveyed by the wildlife agencies stated that it was important to them to maintain abundant wildlife, while a staggering 82% indicated that it was important to preserve endangered species. Favorable attitudes toward abundant wildlife populations and the preservation of endangered species suggest that the general public would strongly support coherent legislation protecting vulnerable species.

5. Ecological Stability

A natural ecological system (ecosystem) consists of all the living organisms (including man) in a select area, combined with the nonliving environment. The science of ecology studies the intricate web of relationships between living organisms and their living and nonliving surroundings. Ecologists generally agree that everything in an ecosystem is intimately connected to everything else in the system, often in complex and poorly understood relationships. A seemingly insignificant change in one part of the system could trigger profound effects in another part of the system.

An ecosystem is the product of billions of years of evolution. While the history of evolution makes it clear that changes in ecosystems are certain to occur, over time species have developed effective defense mechanisms to accommodate these changes. There are limits to the degree of stress that a species and, ultimately, an ecosystem can tolerate when responding to sudden change. Within these limits the ecosystem continually adjusts to external stimuli. If the limits are exceeded, the system may collapse.

The amount of stress which an ecosystem can absorb before col-

61. Id. at 35 states: "In this report wildlife is defined as wild animals...but does not include fish."
62. Id. at [i] (Summary).
63. COUNCIL ON ENVIRONMENTAL QUALITY, ENVIRONMENTAL QUALITY—1970: THE FIRST ANNUAL REPORT OF THE COUNCIL ON ENVIRONMENTAL QUALITY 6 (1970) [hereinafter cited as CEQ 1970 REPORT]; See also, EHRlich, extINCTION, supra note 4, at 78.
64. Id.
65. B. COMMONER, THE CLOSING CIRCLE: NATURE, MAN AND TECHNOLOGY 11-44 (1971); see also EHRlich, extINCTION, supra note 4, at 78.
66. See, e.g., CEQ 1970 REPORT, supra note 63, at 7-8.
67. Id. at 7.
68. Id. See also EHRlich, extINCTION, supra note 4, at 85-86.
69. See, e.g., EHRlich, supra note 4, at 82-86; COMMONER, supra note 65, at 29-41; CEQ 1970 REPORT, supra note 63, at 7-8.
laping is in large part dependent upon biological diversity.\textsuperscript{70} The more complex an ecosystem, the greater the chances that it can resist change. Indeed, diversity has evolved because it maximizes the probability that some individuals of a particular species will survive environmental stress.\textsuperscript{71}

Human beings hold a paradoxical position within an ecosystem.\textsuperscript{72} Biologically, they are merely a part of the whole. However, humans have historically assumed the position of exploiter of the system that sustains them, relying on biological resources for food, medicine, energy, industrial raw material, and aesthetic beauty. Humans may exert stresses on ecosystems, however, which threaten these resources, sometimes in disastrous ways.\textsuperscript{73} If biological diversity is not carefully protected, the ecosystem's ability to absorb changes is weakened, the risk of species extinctions rises markedly, and potential life-sustaining benefits are forever lost.\textsuperscript{74} Biological diversity, therefore, is essential to assure that a varied and sustainable source of animal and plant resources will be available for humankind's use.

\textbf{B. Philosophical Rationale of Species Diversity}

By gradual stages a loving and all-powerful God had created light and darkness, the heavenly bodies, the earth and all its plants, animals, birds and fishes. Finally, God created Adam and, as an afterthought, Eve to keep man from being lonely. Man named all the animals, thus establishing his dominance over them. God planned all of this explicitly for man's benefit and rule: no item in the physical creation had any purpose save to serve man's purposes.\textsuperscript{75}

This anthropocentric notion that a species' right to existence is dependent upon its ability to contribute to human well-being is gradually being eroded as humankind begins to realize the profound implications of coexisting with nature, rather than exploiting nature.\textsuperscript{76} The accumu-
lated body of knowledge of disciplines such as nuclear physics, geophysics, biology and metaphysics is slowly forcing humans to regard the living and non-living components of this world as "one organism."77 Those who reject the notion that species exist solely to satisfy human needs do not enter into a debate over the present or proposed value of a jeopardized species; rather they concede that the species in question is economically worthless, but nevertheless insist upon its right to existence precisely because it exists. "[T]his non-humanistic value of communities and species is the simplest of all to state: they should be conserved because they exist and because this existence itself is but the present expression of a continuing historical process of immense antiquity and majesty."78

No scientific formula can prove that endangered species have an intrinsic right to exist. Yet society is beginning to accept its role as the guardian of nature for its own sake. Although not advocating an unqualified right to existence, many conservation statutes now declare that humankind coexists with nature and must act as its guardian. For example, the preamble to the Convention on International Trade in Endangered Species of Wild Fauna and Flora79 recognizes that peoples and states should protect wild flora and fauna as an irreplaceable part of the natural systems of the earth.80

may also be questioned. When Governor of California he allegedly made the statement: "When you've seen one redwood tree, you've seen them all." See White, supra note 75, at 1206.

77. [I]nternational scientific studies have shown irrefutably that the Earth as a whole is an organized system of most closely interrelated and indeed interdependent activities. It is, in the broadest sense of the term, an 'organism.' The so-called life-kingdoms and the many vegetable and animal species are dependent upon each other for survival in a balanced condition of planet-wide existence. . . . Mankind is part of this organic planetary whole; and there can be no truly new global society, and perhaps in the present state of affairs no society at all, as long as man will not recognize, accept and enjoy the fact that mankind has a definite function to perform within this planetary organism of which it is an active part.


80. The preamble states:
Recognizing that wild fauna and flora in their many beautiful and varied forms are an irreplaceable part of the natural systems of the earth which must be protected for this and the generations to come;
Conscious of the ever-growing value of wild fauna and flora from aesthetic, scientific, cultural, recreational and economic points of view:
Two of the stated purposes of the National Environmental Policy Act of 1969 are to "declare a national policy which will encourage productive and enjoyable harmony between man and his environment, [and] to enrich the understanding of the ecological systems and natural resources important to the Nation." To this end, the American federal government has a mandate to use all practicable means "to create and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic and other requirements of present and future generations of Americans."

The Canadian federal government has recently endorsed the World Conservation Strategy document as a model for the development of conservation planning.

Utilitarianism alone did not influence lawmakers to endorse such conservation legislation. Philosophical and moral considerations are moving society to promote species diversity because of species' right to existence. The argument for legal and social recognition of species' right to exist is forcefully summarized as follows:

Just as blacks do not exist for whites, or women for men, so animals do not exist for humans. Recognizing the peoples and States are and should be the best protectors of their own wild fauna and flora; . . .

Convinced of the urgency of taking appropriate measures to this end;

Have agreed as follows.

82. Id. § 4321.
83. Id.
84. Id. § 4331(a).
85. ENVIRONMENT CANADA, 2 ENVIRONMENT UPDATE 8 (Nov. 1981). The world strategy document was produced by the International Union for the Conservation of Nature and Natural Resources in cooperation with the World Wildlife Fund and the United Nations Environment Program. Two of its objectives are as follows:

To preserve genetic diversity. This is the basis of essential processes and life-support systems as well as of breeding programs necessary for protecting and improving cultivated plants, domesticated animals and microorganisms, many scientific and medical advantages, technical innovation, and the continuation of industries, such as agriculture, forestry and fisheries, which depend on living resources.

To ensure the sustainable utilization of species and ecosystems such as fish and other wildlife, forests and agricultural lands which support millions of rural communities as well as major industries.

Id.

86. See, e.g., Sagoff, Economic Theory and Environmental Law 79 MICH. L. REV. 1393 (1981). Sagoff convincingly argues that "[l]aws like the Endangered Species Act flout [the] conception of economic efficiency. This is how most Americans would have it: most Americans reject the notion that the natural environment should be made over to serve the wants of the self-interested consumer." Id. at 1396 (footnote omitted). Sagoff supports his argument that people have moral convictions about environmental issues that have nothing to do with economic gain by looking at the responses to a number of national surveys. Id. at 1398-1399 and n.25. The American Endangered Species Act of 1973 is discussed infra, at text accompanying notes 171-173. See also CWS 1981 NATIONAL WILDLIFE SURVEY, supra note 57. Two national surveys in the United States found that 67% of the public in 1978 and 73% in 1980 agreed with the statement: "an endangered species should be protected even at the expense of a commercial activity." CEQ 1980 REPORT, supra note 2, at 409.
not exist for us. They are not part of the generous accommodations supplied by a benevolent deity. . . . They have a life, and a value, of their own. A morality that fails to incorporate this truth is empty. A legal system that excludes it is blind. 87

II
LISTING RARE SPECIES

Several vulnerable species of flora and fauna in Canada are in immediate need of legal protection. This section outlines a standardized classification system for jeopardized species and evaluates the procedures for identifying jeopardized species nationally and in the province of New Brunswick. 88

A. Introduction: The Canadian Perspective

The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) 89 consists of representatives from federal, provincial, and territorial governments and three nongovernmental national wildlife conservation groups. 90 COSEWIC commissions scientific reports on the status of jeopardized Canadian wildlife species 91 and makes these reports available to all Canadians. 92 If the evidence from a status report is clear, COSEWIC places the species in one of five defined categories:

*Rare Species:* Any indigenous species of fauna or flora that, because of its biological characteristics, or because it occurs at the fringe of its range, or for some other reason, exists in low numbers or in very restricted areas in Canada but is not a threatened species.

*Threatened Species:* Any indigenous species of fauna or flora that is likely to become endangered in Canada if the factors affecting its vulnerability do not become reversed.

*Endangered Species:* Any indigenous species of fauna or flora whose


88. An assessment of the provincial status of vulnerable species is critical because, in Canada, the provincial governments have primary jurisdiction over wildlife resources. See infra text accompanying notes 122-148.

89. For a brief history of COSEWIC see CWS Man and Wildlife Report, supra note 57, at 31.


91. Id. at 84 (scientific status reports). COSEWIC defines “wildlife” as “any species of flora and fauna” and defines “species” as including “any species, subspecies or geographically separate population.” Id. at 83.

92. The public may obtain, at no cost, summary sheets of the scientific status reports that COSEWIC issues. CWS, Man and Wildlife Report, supra note 57, at 31. CWS Summary Sheets are distributed by the CWS Publications Branch, Ottawa.
existence in Canada is threatened with immediate extinction through all or a significant portion of its range, owing to the action of man.

Extirpated Species: Any indigenous species of fauna or flora no longer existing in the wild in Canada but existing elsewhere.

Extinct Species: Any species of fauna or flora formerly indigenous to Canada but no longer existing elsewhere.\(^9\)

COSEWIC's procedure in developing a status report and a classification for a particular species is elaborate and thorough.\(^9\) COSEWIC is divided into several specialized subcommittees (for example, subcommittees on fish, plants, mammals, and birds), each chaired by volunteers with expertise in the specialty area. The chairperson recruits three to six other experts to sit as members of the subcommittee. Any person concerned with the status of a species can petition the subcommittee responsible for that particular species to investigate the situation. If the concerns are well-founded, the chairperson will commission an initial scientific report from an acknowledged authority on that particular species. A standard protocol outlines minimum requirements for the contents of such reports. The author gives the completed document to the subcommittee members, who often request further elaboration or new information from the author.

After finally approving the report, the subcommittee distributes it to all COSEWIC members. At the annual general meeting, the Report forms the basis of informed discussion concerning the subsequent classification of the species. Final categorization is determined by a vote of the representatives from the three governmental authorities and the three non-governmental national wildlife organizations. As of August, 1983, COSEWIC had categorized 24 species as rare, 12 as threatened, 16 as endangered and 2 as extirpated.\(^9\)

COSEWIC's status reports are invaluable educative tools for authorities responsible for protecting vulnerable species. Its classification system also provides a useful standardized guide for scientists. Nevertheless, the role which COSEWIC plays in protecting vulnerable wildlife is limited. First, COSEWIC has no statutory, regulatory or coercive powers.\(^9\) Legislative authorities, therefore, are not legally obliged to consider the status reports or to adopt the classification system. Secondly, COSEWIC warns that while it has commissioned status


\(^{94}\) Interview with Monte Hummel, Executive Director of the World Wildlife Fund (Canada) (September, 1983) (information concerning the operation of COSEWIC). WWF (Canada) is one of the non-governmental organizations represented on COSEWIC. CWS, CO-OPERATIVE PROGRAMS, supra note 90, at 83-84.

\(^{95}\) Interview with Monte Hummel, Executive Director of the World Wildlife Fund (Canada) (September, 1983) (in addition to the 54 classified species, at least 60 status reports have been completed, but the species have not yet been placed in any category).

\(^{96}\) CWS MAN AND WILDLIFE REPORT, supra note 57, at 31.
reports for many of the highly visible jeopardized species, a great deal more work remains to be done on less conspicuous species, especially fishes and plants. 97 Indeed, one noted Canadian botanist, Dr. George Argus, estimated that in the plant kingdom alone, approximately 440 Canadian species are rare. 98 He notes that "[d]etailed information on these taxa . . . either does not exist or has not been assembled; therefore we are unable to do more than speculate about the endangered status of these rare Canadian plants." 99 Argus concludes that this raw data "must of necessity emanate from local field botanists and naturalists." 100 Finally, COSEWIC status reports assess the vulnerability of wildlife from a national perspective. A species which is abundant in a western province but is in danger of extinction in a Maritime province would likely not be categorized. 101

In summary, COSEWIC plays a critical role in providing legislators with thorough scientific information on the vulnerable status of a number of species. Its classification system provides a standardized guideline for scientists doing local fieldwork throughout Canada. However, neither the status reports nor the classification system have any legal force.

B. The New Brunswick Perspective

1. Introduction

Provincial legislators are primarily responsible for legally protecting wildlife within each province. 102 Therefore, it is critical for these legislators to obtain an accurate assessment of vulnerable species in their province. COSEWIC assesses a species only from a national perspective, 103 and in any case the COSEWIC reports are not yet complete, due to time and financial constraints. Most experts agree that researchers must generate the required information locally. 104 This

97. CWS CO-OPERATIVE PROGRAMS, supra note 89, at 84. Interview with Monte Hummel, Executive Director of the World Wildlife Fund (Canada) (September, 1983) (Hummel pointed out that time, financial constraints, and the voluntary nature of COSEWIC limits the number of status reports that can be produced).


99. Id.

100. Id.

101. Interview with Monte Hummel, Executive Director of the World Wildlife Fund (Canada) (September, 1983). See also supra text accompanying note 93 (COSEWIC's five defined categories stress the geographic range of concern as "in Canada").

102. See infra, text accompanying notes 122-148.

103. See supra note 101.

104. Interview with Harold Hinds, Curator of the Connell Memorial Herbarium at the University of New Brunswick and the author of the most recent provincial inventory of rare
section examines the listing of rare species within New Brunswick as an example of the type of information that is needed if vulnerable species are to be adequately protected.

In order to protect vulnerable species legislators require accurate information on the status of flora and fauna. Experts sometimes disagree as to the exact status of a particular species because information concerning the species in question may be incomplete. Often, the only available data is anecdotal or hearsay and has not undergone rigorous field analysis. Information that is properly collected may be difficult to standardize because field workers vary in their interpretation of terms such as "rare," "threatened" or "endangered." Further, classification problems also occur in the identification of similar species, hybrids, or single species with minor variations. Direct and close consultation between legislators and scientists is, therefore, essential to ensure that the vulnerable species lists are prepared by acknowledged experts who employ standardized classification systems (such as COSEWIC's) and who subject their work to peer review.

2. New Brunswick's Flora

In an intensive effort to fill information gaps, the National Museum of Natural Sciences has been cataloging, since 1975, the rare vascular plants of the provinces and territories of Canada. The New Brunswick Report includes over 200 species of plants classified as rare within the province. Many of these plants are peripheral species whose main range lies outside the province. But while these species may be abundant elsewhere, the importance of preserving them in New Brunswick "can be understood in terms of their contribution to the biological and aesthetic diversity of the province and the unique genetic characteristics that are often possessed by organisms at the edges of their ranges." At least seven plants are endemic to New Brunswick or to immediately adjacent areas. Four more plant species found in New Brunswick are rare throughout Canada. Presently, the endemic

vascular plants (June, July, 1983) [hereinafter cited as Hinds Interview]. See also ARGUS, THREATENED AND ENDANGERED SPECIES, supra note 98, at 17.

105. Id.
106. Hinds Interview, supra note 104.
107. Id.
109. Hinds, supra note 108, at app. (listing the vulnerable flora within the province).
110. Id. at 3. Such rare New Brunswick plants would not be considered by COSEWIC.
111. Id. at 13-14.
112. Id.
Furbish lousewort is the only species of flora that is legally protected.\textsuperscript{113} Legislators should carefully assess the remaining ten species for immediate inclusion on the legal endangered species list.\textsuperscript{114}

The New Brunswick Report documents a number of plant species that have been extirpated because of human activity. The flooding of land behind hydroelectric dams on the St. John River resulted in the extirpation of at least four known plant species. Industrial and residential development near the mouth of the river led to the probable extirpation of two more plant species.\textsuperscript{115} The Report also warns that the proposed oil shale strip mining development in the southeastern part of the province will seriously diminish the rare plant resources in that area.\textsuperscript{116}

3. \textit{New Brunswick's Fauna}

Currently the Eastern panther, the Canada lynx, the bald eagle, the osprey and the peregrine falcon are legally classified as endangered fauna in New Brunswick.\textsuperscript{117} Available data suggests that extinct or extirpated species formerly resident in New Brunswick include the Labrador duck, the great auk, the woodland caribou and the Eastern wolf.\textsuperscript{118}

A recent preliminary list compiled for the New Brunswick Museum documents the vulnerable fauna of the province.\textsuperscript{119} The document concludes that at least 32 species of insects, six species of fresh water mollusca, seven species of fishes, one amphibian, 23 species of birds and 12 species of mammals (81 species in total) are currently known to be vulnerable within the province.\textsuperscript{120} The legislature should consider the Maritime Ringlet Butterfly, the pigmy smelt, the dwarf wedge mussel and the piping plover for immediate protection because these species are endemic to New Brunswick or rare throughout their North American range.\textsuperscript{121}

\textsuperscript{113} Endangered Species Regulation 82-248, § 3 (1983) [promulgated pursuant to the Endangered Species Act, N.B. REV. STAT. ch. E-9.1 (1973)].
\textsuperscript{114} Id. note 104.
\textsuperscript{115} Id., supra note 108, at 14.
\textsuperscript{116} Id.
\textsuperscript{117} Endangered Species Regulation 82-248, § 2 (1983) [promulgated pursuant to the Endangered Species Act, N.B. REV. STAT. Ch. E-9.1 (1973)].
\textsuperscript{118} Interview with David Christie, former curator of the New Brunswick Museum (May, 1983); interview with Mary Majka, noted New Brunswick naturalist (May, 1983); Hinds Interview, supra note 104.
\textsuperscript{119} S. \textit{Claydon}, \textit{Rare and Endangered Plants and Animals of New Brunswick} (1983) (in press; manuscript copy on file with the author). Claydon's work is based in part upon a draft manuscript, prepared for the New Brunswick Museum by Carol Guidry in 1982. The section of the document dealing with vulnerable flora relies primarily upon the work of Professor Hinds, supra notes 104-108.
\textsuperscript{120} Id.
\textsuperscript{121} Id. See also Christie, Majka, and Hinds Interviews, supra note 118.
THE STATUTORY FRAMEWORK FOR PRESERVING VULNERABLE SPECIES

A. Introduction: Constitutional Constraints

The Constitution Act, 1867122 (formerly the British North America Act, 1867) divides the powers needed to govern Canada between a central authority (the federal Parliament) and several regional authorities (the provincial legislatures).123 An understanding of the role each level of government plays in protecting wildlife requires an examination of constitutional principles determining ownership rights to land and legislative powers to regulate natural resources on that land.

Part VIII of the Constitution Act, 1867 divides the ownership of land between the federal and provincial governments.124 Section 108 expressly transfers certain lands to the federal Parliament, including canals, public harbors, river and lake improvements, military roads and lands set apart for general public purposes.125 Section 117 states that the provinces retain property "not otherwise disposed of by this Act."126 Section 109 reinforces this residual clause by declaring that all lands belonging to the provinces, except those listed in section 108, should continue to belong to the provinces.127 Thus, the Constitution Act, 1867 ensures that the provinces retain ownership of most of the lands within Canada.128 Traditional common law principles and judicial interpretations of the Constitution Act, 1867 grant ownership over the natural resources pertaining to land, including wildlife, to the occupier of that land.129 Therefore, all flora and fauna within a province that are not habitually domiciled on federal land are owned by that province.

The fact that the provinces have proprietary rights over most wildlife in Canada does not necessarily mean that the provinces have legis-

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122. Constitution Act, 1867, 30 & 31 Vict., ch. 3.
123. See generally P. HOGG, CONSTITUTIONAL LAW OF CANADA (1977).
128. The federal government has ownership rights over vast areas of land in Canada's north (the Yukon Territory and the Northwest Territories). However, Parliament delegated to the two Territorial Councils extensive powers of self-government corresponding to the powers of the provinces. See P. HOGG, CONSTITUTIONAL LAW OF CANADA, 216 (1977). Therefore, efforts to reform endangered species legislation would be directed to the territorial councils. For this reason, any reference to the provinces in this paper includes the territorial governments.
lative control over that wildlife. Part VI of the Constitution Act, 1867, conveys to the federal Parliament the exclusive power to legislate with respect to a particular class of subjects, and to the provincial legislatures the exclusive power to legislate with respect to other subjects. These provisions must be examined to determine which level of government can legislate with respect to wildlife. Section 92 of the Constitution Act, 1867 declares that:

In each Province the Legislature may exclusively make laws in relation to . . .

(5) The Management . . . of the Public Lands belonging to the Province . . .

(13) Property . . . Rights in the Province . . .

(16) Generally all matters of a merely local or private nature in the Province.

Section 91(1A) has a similar provision exclusively authorizing the federal government to enact legislation with respect to its own "public . . . property." Therefore, each provincial government has both the proprietary and the legislative power to regulate most wildlife within its borders. There are, however, four significant exceptions.

First, as outlined above, federal agencies own and regulate wildlife on federal lands. Secondly, while ownership of inland fishes is generally reserved to the provinces, by virtue of section 91(12) of the Constitution Act, 1867, the federal parliament has legislative jurisdiction over the "[s]eacoast and inland fisheries." The courts have examined the legislative powers of each level of government with respect to fisheries on a number of occasions. Although certain problems

130. The distinction between ownership and legislative control is made clear by the Judicial Committee on the Privy Council, asserting the proposition that legislative jurisdiction does not necessarily confer property rights:

There is a broad distinction between proprietary rights and legislative jurisdiction. The fact that such jurisdiction in respect of a particular subject-matter is conferred on the Dominion Legislature, for example, affords no evidence that any proprietary rights with respect to it were transferred to the Dominion. There is no presumption that because legislative jurisdiction was vested in the Dominion Parliament proprietary rights were transferred to it. The Dominion of Canada was called into existence by the British North America Act, 1867. Whatever proprietary rights were at the time of the passing of that Act possessed by the provinces remain vested in them except such as are by any of its express enactments transferred to the Dominion of Canada.


133. Constitution Act, 1867, 30 & 3 Vict., ch. 3, § 91(1A).


135. See supra notes 125, 129 and accompanying text.


are not completely resolved, there is general agreement that the provinces retain proprietary and marketing rights over fishes in provincial waters, while the federal authorities control the regulatory aspects of fishing, including seasons and conservation measures. Federal agencies rather than provincial authorities, therefore, are primarily responsible for the preservation of vulnerable fish species. Thirdly, migratory wildlife that habitually cross provincial or international borders likely fall within federal jurisdiction.

Finally, the federal government has some measure of control over wildlife that is the subject of international treaties. In 1867 the various colonies of the British empire, while self-governing in domestic affairs, lacked the capacity to enter into treaties as stated in Section 132 of the Constitution Act, 1867:

The Parliament . . . of Canada shall have all Powers necessary or proper for performing the Obligations of Canada or of any Province thereof, as Part of the British Empire, towards Foreign Countries, arising under Treaties between the Empire and such Foreign Countries.

No one considered at that time that Canada would become a sovereign nation capable of entering into its own treaties. For example, a 1917 treaty between Great Britain and the United States obligated Canada to protect migratory birds. However, by the 1930's Canada had achieved international autonomy and section 132 of the Constitution Act, 1867 was arguably obsolete. It was then unclear which level of government could enter into and implement a treaty.

This issue was resolved by the Judicial Committee of the Privy Council in Attorney-General for Canada v. Attorney-General for Ontario. The court held that the federal government has the executive authority to enter into international agreements but legislation implementing the obligations of the treaty must be passed by whichever level of government has legislative jurisdiction over the subject matter of the treaty. Thus, the federal Whaling Convention Act ratifies the obligations negotiated by the federal government under the Whaling Con-
vention, in accordance with the exclusive federal power to enact statutes relating to seacoasts and inland fisheries. The Export and Imports Permit Act adopting the Convention on the International Trade in Endangered Species of Wild Fauna and Flora is valid federal legislation founded on the exclusive federal powers over international and interprovincial trade. However, a bilateral treaty negotiated by the federal government and the United States to protect the furbish lousewort, an endangered flower endemic to Maine and New Brunswick, would have to be ratified by the provincial government, since the provinces have legislative jurisdiction over the flora within their borders.

In summary, constitutional principles grant provincial legislatures the ownership over most wildlife within the province and the legislative authority to regulate that wildlife. There are four exceptions: 1) wildlife found on federal lands is owned and regulated by federal authorities; 2) most fish species are owned by the provinces but are regulated by federal authorities; 3) wildlife that habitually migrate across provincial or international borders are probably regulated by federal authority; 4) wildlife regulated by international agreements concerning wildlife are negotiated by federal authorities but are implemented by the federal or provincial authority having original legislative jurisdiction over the wildlife in question.

Any serious effort to preserve jeopardized species must be aimed at provincial legislatures as the authorities with primary regulatory control over wildlife and their habitats. The remaining subsections will scrutinize provincial legislation to determine if vulnerable flora and fauna and their habitats are adequately protected throughout Canada. It is hoped that legislators will assess the strengths and weaknesses of the present legislative responses and enact or amend provincial statutes to ensure that these species are protected.

B. Provincial Endangered Species Legislation

1. Generally

Newfoundland, Prince Edward Island, Nova Scotia, Quebec, and Saskatchewan have no legislative or regulatory provisions which specifically advocate the preservation of vulnerable flora and fauna.

148. Constitution Act, 1867, 30 & 31 Vict., ch. 3, § 91(2). See also CITES, supra note 62.
149. In order to ensure accuracy, the author wrote each provincial and territorial ministry responsible for wildlife management, requesting an update on the current status of their endangered species legislation. As of October 1, 1983 only the Northwest Territories had not replied. Certain provinces stated that they were actively considering the possibility of
The fish and game legislation of Manitoba, \(^{150}\) British Columbia, \(^{151}\) Alberta, \(^{152}\) the Yukon, \(^{153}\) and the Northwest Territories, \(^{154}\) by contrast, contain provisions expressly providing for the protection of endangered wildlife.

Unfortunately, these statutes give only limited protection to vulnerable species. They usually restrict their definition of "wildlife" to mammalian, bird, and sometimes, amphibian and fish species. \(^{155}\) Thus enacting or improving their endangered species legislation. Hopefully, this paper will assist them in their deliberations.

150. Manitoba's Wildlife Act, ch. 73, § 7, 1980 Man. Stat., declares:

The minister may, by regulation, declare any species or type of wildlife or any aggregation of a species or type of wildlife to be an endangered species or an endangered aggregation, as the case may be, and may, by regulation,

(a) prohibit or restrict the hunting, taking, killing or possession of the species or aggregation or any member thereof by any person;

(b) prohibit or restrict the entry by any person into an area of the province specified in the regulation where, in the opinion of the minister, any habitat of the species or aggregation is or is likely to be located;

(c) prescribe other prohibitions or restrictions or measures, to be observed or implemented, for the preservation of the habitat of the species or aggregation and for the survival thereof.


(1) Where he considers that a species of wildlife is threatened with imminent extinction throughout all or a significant portion of its range in the Province owing to the action of man, the Lieutenant Governor in Council may, by regulation, designate the species as an endangered species.

(2) Where he considers that a species of wildlife is likely to become endangered in the Province if the factors affecting its vulnerability are not reversed, the Lieutenant Governor in Council may, by regulation, designate the species as a threatened species.

The regulation accompanying this act, 340/82, div. 5.01, B.C. Gaz. 553, 555 (Aug. 24, 1982), designates the Vancouver Island marmot, the sea otter, the burrowing owl, and the white pelican as endangered species.


153. The Wildlife Ordinance, ch. 16, § 2(1), Yuk. Ord. 2d (1981), declares that "'especially protected wildlife' means an elk, musk ox, deer, cougar, gyrfalcon, peregrine falcon, trumpeter swan, or any other wildlife of a species or type declared by the regulations to be specially protected wildlife." To this end, the federal government enacted the CONSOLIDATED REGULATIONS OF CANADA ch. 1610 (1978), under authority of the Yukon Act, CAN. REV. STAT. ch. Y-2, § 17(3) (1970), which declares that bison, black-tailed deer, elk and musk-oxen are game in danger of becoming extinct.

154. The CONSOLIDATED REGULATIONS OF CANADA ch. 1236 (1978), passed under the authority of the Northwest Territories Act, CAN. REV. STAT. ch. N-22, § 14(3) (1970) declares that the barren-ground caribou, the musk-ox, the polar bear and the wood buffalo are game in danger of becoming extinct.

155. See, e.g., Alberta's Wildlife Act, ALTA. REV. STAT. ch. W-9, § 1(w) (1980), amended by ch. 35, § 2, 1982 Alta. Stat., which states that "'wildlife' means any vertebrate animal. . . but does not include. . . domestic animals. . . or fish." British Colombia's Wildlife Act, ch. 57, § 1, 1982 B.C. Stat., defines, respectively, "endangered" and "threatened species" as a species of animal which is designated as endangered or threatened, and defines "animal" as a mammal, reptile, amphibian or bird.
all flora, insecta, mollusca and, usually, amphibians and fish cannot be legally protected without statutory amendment. The penalty provisions for breaches of statutes regulating the taking of abundant wildlife usually do not reflect the serious consequences of taking endangered species. In addition, lay people perceive these statutes as legislation designed to control fishing and hunting. No educative function is addressed; the general public is not alerted to the need for protecting certain wildlife.

Moreover, there is, in principle, a conceptual irony in attempting to preserve endangered species in statutes designed to regulate the killing of wildlife. Serious efforts to protect vulnerable species must begin with separate enactments devoted exclusively to this goal. Yet only New Brunswick and Ontario have such statutes. The following critique of this legislation highlights the strengths and weaknesses which regulators must consider when enacting or amending their endangered species legislation.

2. *Endangered Species Legislation in New Brunswick and Ontario*

a. Preamble

The Ontario Endangered Species Act begins with a preamble declaring that the purpose of the statute is "to provide for the conservation, protection, restoration and propagation of species of fauna and flora of the Province of Ontario that are threatened with extinction." New Brunswick's Endangered Species Act contains no preamble.

Since endangered species statutes are a recent phenomenon, the judiciary may have difficulty assessing their intrinsic worth and public support. A carefully drafted preamble can provide courts with an unambiguous statement of the intention of the statute, outline the public's serious concern with jeopardized species and educate lay people about its essential purpose. New Brunswick's Interpretation Act confirms that a preamble is an integral part of a statute which the courts should

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156. *See, e.g.*, Alberta's Wildlife Act, ALTA. REV. STAT. ch. W-9, § 125 (1980), which states:

A person who contravenes any provision of this Act or the regulations for the contravention of which no specific penalty is provided is guilty of an offence and liable to a fine of not less than $10 and not more than $1000, and in default of payment to imprisonment for a term not exceeding 3 months.

No further penalties are provided in the provincial regulation, supra note 152, which protects the double-crested cormorant and white pelican pursuant to this wildlife statute.


158. Endangered Species Act, ONT. REV. STAT. ch. 138 (1980) [hereinafter cited as ONT. E.S.A.]. To date there have been no amendments or prosecutions under this act.

159. *Id.* at preamble.

160. N.B.E.S.A., supra note 157. To date there are no prosecutions under this act.
use as an interpretive aid.\textsuperscript{161}

While the Ontario preamble is a good precedent, a more effective preamble might read as follows:

Her Majesty, by and with the advice and consent of the Legislative Assembly of [New Brunswick] finds that:
(1) various species of flora and fauna have been rendered extinct as a result of predation and economic development untempered by adequate concern over the preservation of threatened or endangered species;
(2) certain species of flora and fauna in [New Brunswick] have been so depleted in numbers that they are currently in danger of, or threatened with, extinction;
(3) these species are of ecological, educational, aesthetic, historical, medical, recreational and scientific value to [New Brunswick] and its people, and have a \textit{prima facie} right to existence and declares that:
(1) in accordance with the above findings, the purposes of this statute are to provide a means whereby threatened and endangered species may be conserved to the greatest extent practicable, and to provide a program for the regeneration of such species.\textsuperscript{162}

Such a preamble unequivocally alerts the public and the judiciary to the need to protect vulnerable species and the overall intent of the regulatory scheme.

\textbf{b. Administrative Discretion and Extent of Protection}

Both the New Brunswick and the Ontario Endangered Species Acts empower the Lieutenant-Governor in Council (the Executive Cabinet)\textsuperscript{163} to make regulations declaring any species of flora or fauna


\textsuperscript{162} The model preamble in the text is an adaptation of the comprehensive preamble of the American Endangered Species Act of 1973 \textsuperscript{\S} 2, 16 U.S.C. \textsuperscript{\S} 1531 (1982).

\textsuperscript{163} The phrase “Lieutenant-Governor in Council” means the Lieutenant-Governor acting as the official representative of the Queen by and with the advice of the executive cabinet of the province. The phrase “Governor General in Council” has a like meaning in the federal context. In most Commonwealth countries which recognize the Queen (presently Queen Elizabeth II) as the formal head of state, the government is often referred to as “the Crown.” Historically, all government powers were vested in the monarch, and were exercised in the colonies through delegates appointed by the monarch. In the Canadian federal system, the federal government is often called the Crown in right of Canada, while a provincial government would be referred to as the Crown in right of the province in question. The Governor General is the representative of the Queen in right of Canada; the Lieutenant-Governor for each province is the Queen’s representative in that province.

While the Queen, through her official representatives, is still the titular head of state (both federally and provincially) actual power is held by the two levels of government.
to be threatened with extinction ("endangered" under COSEWIC's classification scheme)\(^{164}\) by reason of the destruction or drastic modification of its habitat, over-exploitation, disease, predation or the use of chemicals.\(^{165}\) The Ontario statute has a final catch-all section allowing the Cabinet to declare a species endangered "[for] any other factor. . . considered relevant,"\(^{166}\) a provision that should be included in all such legislation to ensure that vulnerable species can be protected from unforeseen threats.

The success of these two statutes rests entirely upon how the Cabinet exercises its discretion to pass regulations declaring a species to be endangered.\(^{167}\) The risks of granting the Cabinet such unfettered power might be reduced if the legislature created an advisory council with the mandate to inform the Minister responsible for the administration of the statute of the current status of vulnerable species in the province. The Minister should then be obliged to include this information in the Annual Report of his Department which is tabled in the Legislative Assembly.\(^{168}\)

A more serious shortcoming is that neither statute addresses the issue of species not yet endangered but likely to become so unless

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Longstanding convention dictates that the Queen's representatives will only exercise their powers in accordance with the advice of the federal or provincial executive cabinet. Each executive cabinet consists of the heads of the various government departments and is presided over by the Prime Minister (federally) or the Premier (provincially). The cabinet is in most matters the supreme executive authority, formulating and carrying out all executive policies. It is also responsible for the administration of all governmental departments. See generally; 8 C.E.D. (Ont. 3d), Title 40; Hogg, supra note 96, at 154-167; R.M. DAWSON, The Government of Canada Part III (4th ed., 1969); GALL, The Canadian Legal System 34, 37, 48 (2d ed., 1983).

164. See supra note 93 and accompanying text.

165. N.B. E.S.A., supra note 157, §§ 1(a)-(f), 3(1); ONT. E.S.A., supra note 158, § 3(1)(a)-(e).

166. ONT. E.S.A., supra note 158, § 3(1)(f).

167. A fundamental task of the elected representatives in the federal Parliament and the provincial legislatures is to debate bills and enact them as statutes. In recent years, this lawmaking process has diffused substantially; governments have been so busy establishing general policy that they have little time, or lack the expertise, to fill in the details of statutes. An accepted practice is for Parliament or a legislature to delegate its powers to the executive government to make regulations to carry out the objects of the statute. The New Brunswick Endangered Species Act, for example, defines an endangered species as any species which is in fact threatened with extinction because of one of five specified reasons, "and declared by regulation to be endangered." N.B.E.S.A., supra note 157, § 1 (emphasis added). The Ontario Endangered Species Act § 3(1) has a similar restriction. See Ont. E.S.A. supra note 158. In practice, regulations are drafted by civil servants and approved by the executive cabinet. Once approved, the regulation has the force of law. No legal mechanism can be used to force the Cabinet to exercise a discretionary power to promulgate regulations. See generally Arthurs, Regulation-Making: The Creative Opportunities of the Inevitable, 8 ALBERTA L.R. 315 (1972); 31 C.E.D. (Ont. 2d.), Title 1346, §§ 322-34; GALL, supra note 163, at 37-40.

168. The value and functions of an Advisory Board are outlined in the text accompanying notes 190-193, infra.
trends are reversed (threatened species). Prudence dictates that effective legislation should not only protect those species that are in fact endangered, but also those which are potentially endangered. Legislation dealing exclusively with endangered species is remedial, and does not provide protective measures until the last possible moment. The economic and social costs of a mistake at this stage are severe and permanent. Legislation which regulates threatened species, by contrast, is preventive. It is somewhat more flexible, less difficult to implement and more forgiving if errors occur. Mistakes made with anticipatory statutes are rarely irreversible. The protection of threatened species also accords with the aim stated in the model preamble and the preamble to the Ontario Endangered Species Act, of regenerating endangered or threatened species to sustainable levels.

The American Endangered Species Act adopts this judicious approach by authorizing the Secretary of the Interior to identify both endangered and threatened species, designate habitats critical to their survival, establish and conduct programs for their recovery, and assist states and other countries in conserving them. The Secretary is empowered to enforce prohibitions against or issue permits controlling the taking, harassing and trading in endangered or threatened species.

A further progressive feature of the American legislation involves "similarity of appearance" cases. The Secretary of the Interior is given the discretionary power to declare an abundant species to be threatened or endangered if he finds that the abundant species so closely resembles a vulnerable species as to constitute a significant threat to the existence of the vulnerable species.

Legislation controlling the regulatory power of Cabinet, protecting threatened as well as endangered species, and providing for "similarity of appearance" cases would provide the strongest legal framework practicable for preserving jeopardized species.

169. See supra note 93 and accompanying text.
170. See supra text accompanying notes 159 and 162.
172. Id. §§ 1538, 1539. American endangered species legislation prior to the 1973 Act focused on species in imminent danger of extinction. The decision to include threatened species in the 1973 Act is outlined in Rosenberg, Federal Protection of Unique Environmental Interests: Endangered And Threatened Species 58 N.C.L. REV. 491, 491-508; ENVIRONMENTAL LAW INSTITUTE, THE EVOLUTION OF NATIONAL WILDLIFE LAW 386-95 (1977). The CEQ 1980 REPORT, supra note 2, at 70 lists the animals and plants designated or proposed as endangered or threatened species and concludes: "[a]lthough no animal or plant species has recovered sufficiently to be completely delisted, several species or populations have been upgraded from endangered to threatened."
c Offences and Penalties

Both the New Brunswick$^{174}$ and the Ontario$^{175}$ Acts prohibit killing, injuring, or interfering with any member of an endangered species or attempting to do so. The Ontario Act also prohibits destruction of or interference with the habitat of any endangered species of flora or fauna.$^{176}$ Curiously, New Brunswick’s Act protects the habitat of endangered flora but not fauna.$^{177}$ One of the most effective ways to eradicate a species is to destroy its habitat.$^{178}$ This glaring oversight should be corrected immediately.

The mens rea element requisite to prove a provincial offense may fall into one of three broad categories: 1) intention, including knowledge and recklessness; 2) strict liability, where the prosecution must establish the actus reus beyond a reasonable doubt, thereby shifting the onus to the defendant to prove due diligence (non-negligent conduct); 3) absolute liability, where a conviction follows immediately upon the prosecution’s proof of the actus reus.$^{179}$ The offense sections in New Brunswick’s Endangered Species Act would almost certainly be classified as strict liability provisions.$^{180}$ However, the mens rea element of Ontario’s offence section is not clear because of the inclusion of the word “willfully.” Willfully could mean consciously as opposed to accidentally or it could mean intentionally (knowingly).$^{181}$ In most situa-
tions it would be extremely difficult for the prosecution to prove beyond a reasonable doubt that the defendant intended to contravene the Endangered Species Act. Once the guilty act is established, it would be more reasonable to shift the onus onto the defendant to show due diligence or non-negligent conduct in carrying out the impeached activity. The word “willfully” should therefore be deleted from the Ontario statute to ensure that courts interpret the provision as a strict liability offence.

The maximum fines under both Acts are grossly inadequate given the potential economic incentive involved in disregarding these laws. Any person who violates section 4 or 5 of the New Brunswick Act is subject to a fine of not less than $25 and not more that $1,000 and or imprisonment for up to six months. Any person who breaches the Ontario statute is subject to a fine of not more than $3,000 and or imprisonment for up to six months. A large corporation which intends to develop a sensitive area may view such a fine as an acceptable operating expense. A small maximum fine has a tendency to mold the perception of the courts and lay people that the legislation is relatively unimportant. Provisions allowing for a maximum fine of $5,000 for an individual, and $50,000 in the case of a corporation are more reasonable. Such penalties impress upon the judiciary and lay people the public concern over preserving vulnerable species and give the courts flexibility in assessing the fine according to the severity of the breach. An innovative provision giving a percentage of the levied fine to any private individual who prosecutes an offender or who acts as a principal witness in a prosecution would aid in the enforcement of the legislation and would encourage lay people to develop a better understanding of the law and its purpose.

184. A large New Brunswick corporation pleaded guilty to a charge of aerially spraying a controversial herbicide on 9,000 acres of forest lands without a permit. The maximum penalty under the Pesticides Control Act was $1,000. The court imposed a $200 fine. See In re the Pesticides Control Act of the Province of New Brunswick; In re Forest Patrol Ltd., No. 45-3025A (12/76) slip op. of Judge Donald R. Allen, Provincial Court (1979) (on file with the author). Subsequent to this case the Act was amended and the fine increased to $50,000. See Pesticides Control Act, N.B. Rev. Stat. ch. P-8, § 30 (1973), amended by ch. 48, § 18 1982 N.B. Stat.

One-half of every penalty imposed and collected under this Act or any regulation, when a game officer appointed without salary or any person who is not a game officer is the prosecutor, shall be paid to such game officer or person or to the
d. **Scope of Application**

The Interpretation Act of each province except for British Columbia declares that the Crown is not bound by a provincial statute unless the statute expressly states that the Crown is so bound. For example, section 32 of New Brunswick’s Interpretation Act declares that “[n]o Act impairs or adversely affects the rights of the Crown unless it is expressly stated therein that the Crown is bound thereby.”

For the purposes of the provincial interpretation statutes, the “Crown” includes governmental departments, agencies and corporations. Unquestionably, these organizations are responsible for a tremendous amount of development within a province. Yet neither the New Brunswick nor the Ontario statute expressly binds the Crown. The goal of this type of legislation is severely compromised if the Crown, as one of the largest developers in a province, need not comply with it. Every endangered species enactment should expressly state that the Crown is bound by its provisions.

**e. Advisory Board**

A critical component of endangered species legislation is the establishment of an advisory board to oversee the daily administration of the act. Neither the Ontario nor the New Brunswick statute provides...
for such a board. Since multi-disciplined expertise and broad range representation is critical when developing conservation strategies the board should include wildlife experts from government, private conservation organizations, and universities. The board must be empowered to call before it any person having specialized knowledge concerning any pending issues. The board must be able to receive, investigate, and consider submissions by any person, and hold public hearings concerning matters addressed by the statute. It is of utmost importance that the board be established as the official liaison between scientists and legislators. Acting as a provincial "COSEWIC," an advisory board could effectively document and classify the status of vulnerable species within a province. The board should be obligated to submit a detailed annual report to the Minister on all matters dealt with by the board. The Minister should then table the report in the provincial Legislative Assembly. This procedure would educate the public and the politicians about the status of vulnerable species within the province.

C. Provincial Ecological Reserves Legislation

1. Historical Development of Ecological Reserves Legislation

An ecological reserve may be defined as a legally protected natural area where human influence is kept to a minimum. While an established ecological reserve will serve a multiplicity of purposes, two primary goals include the preservation of the habitat of vulnerable flora and fauna and the conservation of genetic resources to promote biological diversity. Indeed, many scientists agree that the most effective way to protect endangered species and promote species enrich-

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191. See supra notes 105-107 and accompanying text.
192. See supra notes 89-101 and accompanying text.
193. Both the New Brunswick and the Ontario statutes are under the control and direction of the Minister of Natural Resources for each province. N.B.E.S.A., supra note 157, §§ 1, 2; Ont. E.S.A., supra note 158, §§ 1, 2. Requiring the board to report annually to the Minister acts as a check on the unfettered discretion of the Cabinet. See supra notes 167-168 and accompanying text.
196. Id. See also supra text accompanying notes 16-74.
ment is by conserving their habitats or natural ecosystems.\footnote{ARGUS, THREATENED AND ENDANGERED SPECIES, supra note 98, at 18, states that "the most effective way to protect rare and endangered plants is through the protection of their habitats or natural ecosystems." See also Taschereau, supra note 194, at 16.}

The first serious attempt to locate, document and protect sensitive ecosystems began in 1964 with the work of the International Biological Programme (IBP).\footnote{IBP REPORT, supra note 194, at iv-vi; Taschereau, supra note 194, at 1-3.} Fifty-eight nations, including Canada, agreed to commence a ten-year cooperative project to survey and press for the legal protection of ecological systems throughout the world.\footnote{IBP REPORT, supra note 194, at v-vi, n.2.} The field work in Canada was coordinated by the IBP subcommittee for the Conservation of Terrestrial Communities (IBP-CT).\footnote{Id. See also Taschereau, supra note 194, at 1.} For the purposes of the survey, the IBP-CT subdivided Canada into 10 regions, each with its own scientific advisory committee.\footnote{IBP REPORT, supra note 194, at v-vi, n.2.} When the program concluded in 1974, the scientific panel for the Maritime region recommended that 110 sites, including 27 in New Brunswick, be given legal protection as sensitive ecological areas.\footnote{Id. at ix.} However, the final report noted that, due to insufficient funding and administrative difficulties, particularly in New Brunswick,\footnote{See id. at vii.} the IBP-CT had documented relatively few of the ecosystems requiring immediate protection and that work should continue in the Maritime Area toward establishing a comprehensive system of protected, representative ecosystems.\footnote{According to the IBP REPORT, the IBP-CT: has made only a very sketchy beginning in the Maritimes. The Panel and Research Teams have isolated and documented relatively few of the more endangered, rare ecosystems requiring immediate protection. The important work of systematically examining the Maritime area and establishing a comprehensive system of legally protected, representative ecosystems should continue. Id. at ix.}

To this end, surveying continued in New Brunswick in the summers of 1974 and 1975. This work added 38 more areas to the IBP list of proposed ecological reserves, for a total of 65 sites.\footnote{Ecological Reserves in New Brunswick (compiled by D.M. Jones, Ross Wein ed. 1975) 13, 15-16; Ecological Reserves in New Brunswick—1975 Field Work (compiled by R.J. Speer, R. Wein ed. 1975) 1, 4-5.} Pressure exerted on the New Brunswick government culminated in the passage of the Ecological Reserves Act\footnote{See supra note 190.} in 1975.

2. New Brunswick's Ecological Reserves Act

a. The Theory

Section 3 of the Ecological Reserves Act states that the purpose of
the Act includes the reservation of ecological areas: "in which rare or endangered native plants and animals in their natural habitat may be preserved; and . . . that contain unique and rare examples of botanical, zoological, pedological or geological phenomena."207

To accomplish these purposes, the Act sets forth a procedure for setting areas aside as ecological reserves. The Act requires the Environmental Council, a group of at least five non-civil servants established under the province's Clean Environment Act,208 to conduct public hearings prior to the establishment of an ecological reserve and to report the findings of such hearings to the Minister of Natural Resources.209 When the Council has made its report, the Minister may recommend to the Executive Cabinet that an ecological reserve be established.210 Based upon the Minister's recommendation, the Cabinet may, by Order in Council, establish an ecological reserve.211 The Minister may then acquire private land by lease, agreement or exchange for establishing a reserve.212

Once such reserves have been set aside, the Act prohibits a wide range of human activities in them, and lays down a penalty for transgressors. No person may engage in any activity in an ecological reserve, including hunting, fishing, trapping, forestry, agriculture, mining, or construction, that may alter any part of the terrain or the vegetation, or that may disturb the flora or the fauna of a reserve.213 The Act further forbids any person from introducing a plant or animal species into a reserve.214 Any person who breaches any provision of the Act or the Regulations is subject to a fine not exceeding one thousand dollars.215 Finally, the Crown is expressly bound by the provisions of the Act.216

207. N.B.E.R.A., supra note 190, § 3(d)-(e).
209. N.B.E.R.A., supra note 190, § 9(d). The provisions outlined in the text apply to the abolition or change in boundary lines as well as to the establishment of an ecological reserve. Id.
210. Id. § 4(2).
211. Id. § 4(1). The Order in Council will only come into force when it is published in The Royal Gazette and a notice thereof is placed in a newspaper circulated in the county in which the reserve is located. Id. § 5.
212. Id. § 7(1). Unfortunately, the government has not established any procedure to raise money to purchase or lease private lands.
213. Id. § 6(1). These prohibitions are subject to Cabinet regulations respecting the formulation of a management plan for each reserve, the control of entry into the reserve, and other matters necessary or incidental to protecting the reserves. Id. §§ 6(1), 15(a),(b), and (d).
214. Id. § 6(2).
215. Id. § 14.
216. Id. § 6(3).
In the early 1970's a research team from the University of British Columbia reviewed the existing legal framework for protecting ecologically sensitive areas in Canada and developed a model for ecological reserves legislation.\textsuperscript{217} The New Brunswick Ecological Reserves Act compares very favorably with the model recommended by this research group and with most other ecological reserves legislation in Canada.\textsuperscript{218} In particular, as the model urges, the new Brunswick Act provides for mechanisms to designate reserves on Crown and private lands,\textsuperscript{219} to accept private donations of land for reserves,\textsuperscript{220} and to manage and protect the reserves.\textsuperscript{221} The New Brunswick Act also follows the model in providing for the appointment of an Advisory Council, made up of non-civil servants, to investigate matters arising under the act and report to the Minister.\textsuperscript{222} Finally, the Act requires Cabinet approval, with preliminary input from the Advisory Council, before a reserve is established or abolished, or its boundaries are modified.\textsuperscript{223}

In some ways the New Brunswick Act falls short of the model legislation. The Act does not, for example, expressly allow for the expropriation of land or for the establishment of provisional or emergency reserves.\textsuperscript{224} Moreover, the penalty provisions are unacceptably low.\textsuperscript{225} Aside from these shortcomings, it appears that the Ecological Reserves Act can protect sensitive natural areas, thereby preserving vulnerable flora and fauna and promoting biological diversity within New Brunswick. But “it is action that counts not the presence or absence of an Ecological Reserves Act.”\textsuperscript{226}

\begin{itemize}
\item \textsuperscript{217} Franson, supra note 195.
\item \textsuperscript{218} Taschereau, supra note 194, provides an excellent overview of the ecological reserve legislation throughout Canada and compares them all with the model developed by Franson. See id. at 16-21.
\item \textsuperscript{219} See id. at 17; N.B.E.R.A., supra note 190, § 4(1).
\item \textsuperscript{220} Taschereau, supra note 194, at 17. See N.B.E.R.A., supra note 190, § 7(2).
\item \textsuperscript{221} See Taschereau, supra note 194, at 18; N.B.E.R.A., supra note 190, § 15.
\item \textsuperscript{222} See Taschereau, supra note 194, at 18; N.B.E.R.A., supra note 190, §§ 1, 8(1), and (9). The model calls for the advisory council to have powers to determine the direction of the reserves program and the suitability of sites, and to formulate management plans for the reserve. Taschereau, supra note 194, at 18. Under the New Brunswick Act, however, the formulation of management plans is the responsibility of the Lieutenant-Governor in Council. N.B.E.R.A., supra note 190, § 15(a).
\item \textsuperscript{223} N.B.E.R.A., supra note 190, §§ 4(1)-(2), 9(d). The model would require Cabinet approval, after the Advisory Committee has considered and reported on the matter, of orders withdrawing lands from the reserve. Taschereau, supra note 194, at 17.
\item \textsuperscript{224} Taschereau, supra note 194, at 17, 19.
\item \textsuperscript{225} See supra text accompanying notes 184-186.
\end{itemize}
b. The Practice

i. The Reserves Lists

On November 3, 1976, the Cabinet passed Order in Council 76-803 establishing four areas on Crown lands as ecological reserves.227 On March 29, 1979, Order in Council 79-221 declared three more areas on Crown lands to be ecological reserves.228 Because of these two Orders, virtually every person concerned with the preservation of sensitive areas in New Brunswick believed that there were seven legally protected ecological reserves in the province.229 Unfortunately, both Orders in Council may be unenforceable, because one has never been published in The Royal Gazette, as required by the Ecological Reserves Act,230 and the other has not been filed with the Registrar of Regulations, as required by New Brunswick’s Regulation Act.231 Consequently, despite a recommendation that at least 65 sensitive areas are in need of protection in New Brunswick and despite a comprehensive, eight-year-old statute, no reserves have been accorded legal protection. Indeed, in 1981, two sites had to be removed from the proposed reserves lists because forestry and mining activities destroyed their suitability as ecological reserves.232

228. N.B. ORDER IN COUNCIL (Mar. 29, 1979).
229. Interviews with Mary Majka, John Henderson, representatives from the Environmental Council and with Mel Fritton, of the provincial Department of Natural Resources (Feb., Apr., May, 1983). See also New Brunswick Environmental Council, Annual Reports, infra note 232.
230. The Ecological Reserves Act states:

5. Where the Lieutenant-Governor in Council, by order in Council, establishes . . . an ecological reserve . . . (a) the Order in Council shall be published in the ROYAL GAZETTE and shall come into force on the date of such publication . . .

N.B.E.R.A., supra note 190, § 5 (emphasis added). Order in Council 79-221 has never been published in the ROYAL GAZETTE. This author’s own fruitless search was duplicated by the staff at the Queen’s Printer, responsible for publishing THE ROYAL GAZETTE. The Department of Natural Resources representative responsible for managing ecological resources could not find any record of a ROYAL GAZETTE publication date for Order 79-221, nor could he find advertisements or receipts evidencing publication in a local newspaper for either Order in Council. Interviews with Mel Fritton, representative of the Dept. of Natural Resources (Feb., May, 1983). Thus, the three reserves listed in the Order have no legally protected status because the Order has yet to come into force.

231. Order in Council 76-803, listing four reserves, has been published in the ROYAL GAZETTE. 134 N.B. ROYAL GAZ. 1256, 1269 (Dec. 15, 1976). However, New Brunswick’s Regulations Act states that every Order in Council must be filed with the Registrar of Regulations and does not take effect before such date of filing. Regulations Act, N.B. REV. STAT. ch. R-7, § 2(1). The provincial Registrar of Regulations has confirmed that neither Order in Council has been filed. Interview with the Registrar of Regulations for the Province of New Brunswick (July, 1983). A strong legal argument can be made that the seven reserves do not have legally protected status until both orders comply with the Regulations Act and Order 79-221 is published in accordance with section five of the Ecological Reserves Act. See supra note 230.

232. New Brunswick Environmental Council, Sixth Annual Report on New Brunswick
ii. Management Plans

In its First Annual Report on Ecological Reserves,233 the Environmental Council stressed the importance of immediately developing detailed management plans for the four reserves purportedly created by the 1976 Order in Council.234 The Second Annual Report235 for 1977 repeated these concerns, noting that “[a]lthough the four reserves were proclaimed . . . a management program has yet to be established for them. The Environment Council urges that this be done as soon as possible.”236 In May, 1981, under pressure from the Environmental Council and other interested organizations, the Lieutenant-Governor in Council proclaimed the Ecological Reserves Regulation,237 outlining a comprehensive management format for ecological reserves. Section 2 provides that after the establishment of an ecological reserve, the Minister shall forthwith formulate a management plan in consultation with the Environmental Council.238 Each management plan shall consider, among other things, the reasons for establishing the reserve, the geology, climate and soil conditions of the reserve and surrounding areas, the flora, fauna and other significant resources or features of the reserve, and the potential for disturbance to the reserve arising from adjacent areas or activities.239

No person can enter or engage in any work or activity in a reserve without a permit unless the management plan states otherwise.240 The Regulation strictly controls the procedure for granting or revoking such permits. A permit application must include the name of the organization directing the proposed activity,241 the number of people entering the reserve,242 the frequency and duration of their stay,243 a description of the proposed work, including its methodology,244 a description of the portion of the reserve to be utilized and the method of access to the area,245 and a statement as to the predicted ecological impact of the

Ecological Reserves 6 (1981). The reports are issued annually, pursuant to N.B.E.R.A., supra note 190, § 11.


234. Id. at 11.


236. Id. at 2 (emphasis added).

237. Ecological Reserves Regulation 81-55, promulgated pursuant to the Ecological Reserves Act, supra note 190.

238. Id. § 2(1) (emphasis added).

239. Id. § 2(2) (a)-(h).

240. Id. §§ 2(3), 3.

241. Id. § 4(a).

242. Id. § 4(b).

243. Id. § 4(f).

244. Id. § 4(e).

245. Id. §§ 4(d)-(e).
undertaking. The Minister may issue a permit if the proposed undertaking does not conflict with the management plan, and if satisfied with the applicant's knowledge of the special features of the reserve and the applicant's ability to comply with any imposed terms or conditions. The Minister may cancel or modify the terms of a permit already issued if the permit holder has breached the terms of the permit, the undertaking is causing unauthorized or unanticipated effects to the reserve, or for any other reason which compromises the integrity of the reserve. Permit holders must file a detailed report with the Minister within six months of completion of the undertaking. The Minister may refuse to issue a permit, if the undertaking potentially conflicts with the principles of the management plan or the integrity of the reserve.

If properly implemented there is little doubt that the management format outlined in the Ecological Reserves Regulation can effectively protect vulnerable species and promote biological diversity. However, more than two years have passed since the Regulation was enacted and no management plans have been proclaimed. Despite consistent, intensive efforts by the Environmental Council and a legislative mandate that "the Minister shall forthwith formulate a management plan" for each ecological reserve, no progress has been made in developing legally enforceable management plans for any reserve in New Brunswick.

There is little doubt that the Ecological Reserves Act and its accompanying regulation are progressive enactments. They will remain useless, however, until the provincial government commits itself to the letter and the spirit of the law. The government must immediately assess its administrative policies to determine the reasons for the lack of progress in developing ecological reserves; it must review the membership of the Environmental Council to ensure its personnel are qualified experts with an active interest in ecological reserves; it must make a firm commitment to spend the time and money needed to protect properly the sensitive areas of the province.

246. Id. § 4(g).
247. Id., § 5(1)(a)-(c), 5(2), 5(3).
248. Id. § 8(a)-(e).
249. Id. § 7(1).
250. Id. § 6(a)-(b).
251. Discussions with Mel Fritton, New Brunswick Department of Natural Resources (Mar., June, Aug. 1983).
252. See supra notes 232-235.
253. Ecological Reserves Regulation 81-55, supra note 237, § 2(1) (emphasis added).
254. M. Majka and S. Woodley of the New Brunswick Federation of Naturalists, in consultation with this author, drafted an Ecological Reserves Resolution urging the provincial government to accept these principles. The Canadian Nature Federation adopted this
CONCLUSION

Species diversity unquestionably provides humankind with enormous tangible and intangible rewards. Species are of direct economic benefit because they provide food, medicine, industrial and energy raw materials, and aesthetic enrichment. Scientists have explored only a small fraction of the world's flora and fauna for their economic potential, and no one can predict which species will provide valuable material rewards for humankind in the future. Species diversity provides equally important intangible benefits, since it is fundamental to the survival of ecological systems. Further, many conservationists now reject the anthropocentric notion that species exist merely to serve material human aspirations, and argue that species have an intrinsic right to existence.

The realization that modern human activity is destroying species at an alarming rate, coupled with an awareness of the value of preserving species and promoting biological diversity has led to efforts to secure legal protection for endangered species. In Canada, constitutional principles determine that the provinces are primarily responsible for the protection of flora and fauna and their habitats. Therefore, interest groups should concentrate their efforts on pressuring provincial authorities to enact effective conservation legislation. At the very least, an effective legal response must include a statute aimed directly at protecting individual vulnerable species and their habitats, as well as a statute devoted exclusively to preserving sensitive ecological systems. As an initial step, vulnerable species and ecological reserves must be carefully identified. Legislators must maintain direct and close contact with scientists doing local field work on species dynamics and ecological systems to ensure that identifications are accurate and classification schemes are uniform. Once identified, vulnerable species must be legally protected by effective legislation which is administered by governmental agencies dedicated to the principles of species conservation.

The endangered species statutes of New Brunswick and Ontario provide examples of legislation which will not adequately protect a vulnerable species without serious amendment. New Brunswick's Ecological Reserves Act and the administrative regulation accompanying it provide an example of excellent legislation administered by a government with little apparent concern for the principles clearly articulated in its statute. Interest groups devoted to preserving our flora and fauna must be extremely diligent in lobbying for effective conservation legislation administered by agencies that believe in the spirit of the law.

resolution at their most recent annual meeting (Aug., 1983) (resolution on file with the author).
Otherwise, the modern tragedy of species extinction will continue unabated.