Waiting for the Ark: The biodiversity crisis in British Columbia, Canada, and the need for a strong endangered species law

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Abstract. This paper presents an assessment of the status of terrestrial and freshwater biodiversity in British Columbia (B.C.), Canada, based on an analysis of conservation ranks produced by the provincial government's Conservation Data Center. High levels of species endangerment exist across all major wildlife groups in the province, including the extinction or extirpation of many species to date, and the imminent threat of further eliminations. Yet, less than 5 per cent of known species and subspecies at risk get any type of "protection" under B.C. laws. None receive essential habitat protection. Given the magnitude of the biodiversity crisis in B.C. and the inadequacy of the current policy response, we argue that a strong endangered species law is critically needed in the province. Such a law would provide the legal means for the effective protection and recovery of threatened and endangered species in B.C., and thereby fulfill the province's moral, national and international responsibilities for the conservation of its irreplaceable natural heritage.

INTRODUCTION

The planet is undergoing a major biodiversity crisis on par with earlier mass extinction events in the earth's history (Pimm *et al.* 1995; Wood and Flahr 2004). It is estimated that some 16,000 species are currently threatened with extinction, including 12 % of birds, 23 % of mammals and 32 % of amphibians (Baile *et al.* 2004). The effects of climate change are predicted to sharply increase the risk of species extinction, by 2050, within our children's lifetime (Thomas *et al.* 2004). Among the species thought to be most vulnerable to extinction are iconic Canadian wildlife, such as Polar Bears, Muskox and Woodland Caribou (Bailie *et al.* 2004; Cardillo *et al.* 2006). Though the immediate threats are well known (the loss and fragmentation of natural habitat (e.g., Spotted Owl); the introduction of invasive species (e.g., American Elm), the over-exploitation of biodiversity (e.g., Eastern Cod), pollution (e.g., Killer Whale), and more recently global climate change (e.g., Polar Bear), the impacts of biodiversity loss at such an unprecedented scale have only recently been recognized (Boyd 2004). They include major threats to ecosystem integrity and human welfare (Anielski & Wilson 2005; Pimm *et al.* 1995). According to the United Nation's 2005 Millennium Ecosystem Assessment (MEA), two-thirds of the direct benefits people obtain from the "ecosystem services" provided by biodiversity are currently being degraded or used unsustainably (Millennium Ecosystem Assessment 2004). These natural services include: provisioning services such as food, fuels and fibres; regulating services that affect the climate, disease outbreaks, wastes and pollination; cultural services that provide aesthetic, recreational and spiritual value; and supporting services, such as nutrient cycling and water purification (Anielski & Wilson 2005). Given the fundamental importance of biodiversity to human societies, many economists now believe that species' declines and extinctions have negative economic consequences (Perrings *et al.* 2006). The loss of biodiversity impacts not just the production of commodities like the food we eat, the timber we build our homes from, and the medicines that we use to heal

Nature's Hidden Economy: Pollination Services

Pollination is a poorly recognized but critical *regulating ecosystem service* provided by insects, such as bees, wasps, flies and butterflies; birds such as hummingbirds and even some small mammals, like bats. It is critical to the maintenance of biodiversity in the wild (e.g., 90 % of flowering plants are animal pollinated) and ensures food security for human populations. Pollinators are economically important globally because about a third of the food we consume, such as apples, peaches, chocolate, almonds, coffee and berries, are dependent on animal pollinators. The economic value of pollinator services to US agriculture has been estimated to be 5.7-13.4 billion $US a year (Tang *et al.* 2006). The full economic significance for Canadian agriculture has yet to be quantified, though The European races of the Western Honeybee (*Apis mellifera*) alone have been valued at 1 billion $CDN each year (Tang *et al.* 2006). There is increasing evidence of widespread reductions in pollination services in Canada and elsewhere due to declining numbers of pollinating insects (Beismeijer *et al.* 2006; Tang *et al.* 2006). Declining pollinator diversity is thought to be due to the destruction of natural habitat from urbanization, the overuse of toxic pesticides, and industrial agricultural practices (Kearns *et al.* 1998).

ourselves, but many other ecosystem services that directly benefit both the environment and community well-being (Millennium Ecosystem Assessment 2004; Anielski & Wilson 2005). For example, declines in the populations of bees, butterflies and other pollinators as a result of habitat destruction, pesticide use and invasive pests have been estimated to cost farmers millions of dollars each year in reduced crop yields (Tang *et al.* 2006) (see pull-out box, "Nature's Hidden Economy: Pollination Services").

GLOBAL CONTEXT: INTERNATIONAL PROMISES

Though scientists have been raising the alarm over the biodiversity crisis for more than 3 decades, governments have been slow to deal with the problem (Wood & Flahr 2004). In 1992 Canada took a leadership role in coordinating and being the first industrialized nation to sign the international Convention on Biological Diversity (CBD) at the inaugural Earth Summit in Rio de Janeiro, Brazil. The CBD commits Canada and 167 other signatory countries to promote the conservation of biodiversity through domestic initiatives, including the adoption of laws for the protection and recovery of species threatened with extinction (Wood & Flahr 2004). British Columbia, which is Canada's most biologically diverse province, actively participated in the agreement negotiations and formally acknowledged that it would honour the commitments Canada made. British Columbia's responsibilities under the CBD were later outlined in an agreement between the Canadian provinces and the federal government called the National Accord for Protection of Species at Risk in Canada (1996). Signatories to the Accord agreed to either enact endangered species legislation or to use existing laws and policies to protect species at risk within their respective jurisdictions. British Columbia chose the latter, arguing that existing provincial wildlife and resource management laws, such as the Wildlife Act and Forest Practices Code, would protect species at risk in the province. The consequence of this choice is that British Columbia is one of only two provinces in the country that does not have stand-alone endangered species legislation to protect its biodiversity (Boyd 2004).

In this paper we present an assessment of the status of terrestrial and freshwater biodiversity in British Columbia based on an analysis of conservation ranks produced by the Conservation Data Center (CDC), a government agency tasked with identifying, tracking and ranking biodiversity in the province. In particular, we present the first comprehensive estimate on the levels of species endangerment found in the province at the full species and subspecies level. We present evidence of:

- The remarkable richness of biodiversity in the province;
- The existence of high levels of species endangerment in the province, including the extinction or extirpation of many wildlife to date, and the imminent threat of further eliminations; and
- The failure of existing provincial wildlife laws to effectively address the protection of species at risk.

Given the magnitude of the biodiversity crisis in B.C. and the inadequacy of the current policy response, we argue that a strong endangered species law is critically needed in the province. Such a law would provide the legal means for the effective protection and recovery of threatened and endangered species in B.C., and thereby fulfill our moral, national and international responsibilities for the conservation of our irreplaceable natural heritage.

METHODS

Species Covered

Our assessment of the conservation status of biodiversity in British Columbia is based on an analysis of 3672 native and regularly occurring species and subspecies in the province (hereby referred to as "species") (Figure 1). Similar studies have been done elsewhere in Canada (Cannings *et al.* 2005) and internationally (e.g., IUCN Red List; Bailie *et al.* 2004), though our analysis is one of the first in the country to report levels of endangerment across a wide breadth of biological organization (i.e., species to subspecies). Biodiversity in only nine major wildlife groups (i.e., roughly equivalent to biological classes) have been sufficiently studied by the B.C. Government to allow for a comprehensive assessment of species endangerment (Fig. 1). This includes all vertebrates, but not marine mammals and fish (i.e., amphibians, birds, freshwater fish, terrestrial mammals, reptiles and turtles), all vascular plants (ferns and fern allies, conifers and flowering plants), and better-known and inventoried invertebrates (freshwater and terrestrial molluscs, dragonflies and damselflies, and butterflies) (Cannings *et al.* 2005). [Note: Most of the wildlife groups examined in this study are equivalent to full biological classes (e.g., birds, reptiles and turtles, amphibians). In some cases, sub-sets of classes (i.e., biological orders) were examined due to the absence of conservation status data available for the entire class (e.g., butterflies, dragonflies and damselflies).] Taxonomic classes whose conservation status is poorly known in the province (i.e., incomplete assessments by the CDC) were not included in the analysis (e.g., marine species, non-vascular plants and fungi). In addition, we did not include geographically or genetically distinct populations at risk ranked by the CDC. Finally we also excluded accidentals, introduced species, vascular plants of unknown or mixed origin and species ranked as "no status" by the CDC.

In total, 406 species known to be at risk in the province were not included in this study (see Appendix 1; available

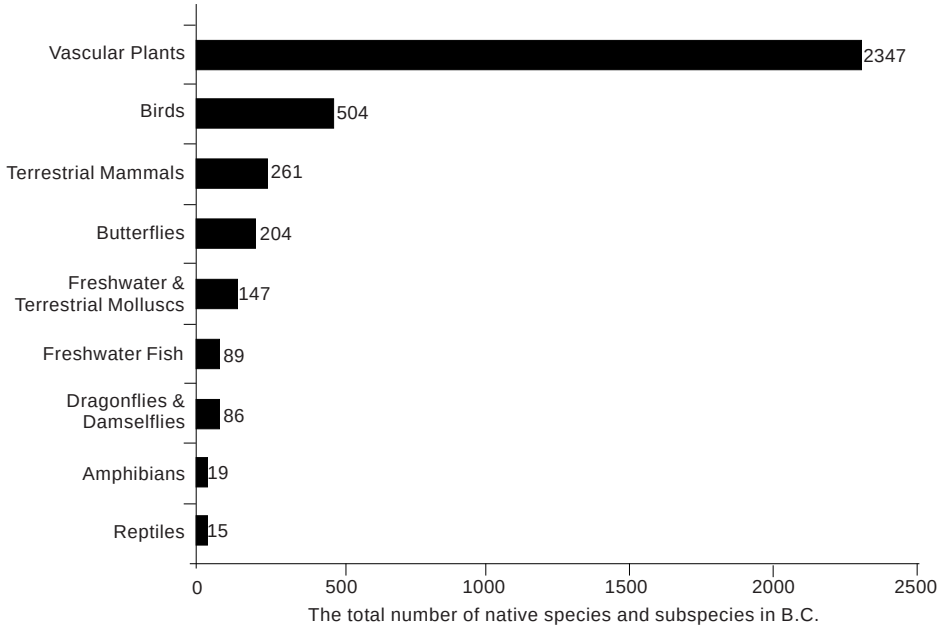

Figure 1. The biological richness of wildlife in British Columbia. The number of native terrestrial and freshwater species and subspecies occurring in major biological classes or orders in British Columbia. All tallies exclude species in the following categories: populations, marine species, non-vascular plants, accidentals, exotics or introduced species, and species listed as no status by the B.C. Conservation Data Center. A full list of species at risk excluded in the analysis is given in Appendix 1. Source: B.C. Conservation Data Center.

at: http://www.davidsuzuki.org/WOL/Publications.asp). Hence this study should be interpreted as a conservative estimate of the levels of species endangerment in British Columbia.

Methods Used to Assess Levels of Species Endangerment

We calculated levels of relative species endangerment (percentage of species at risk) based on an enumeration of at risk wildlife, identified and ranked by the CDC, relative to the number of species and subspecies known to exist within major wildlife classes or orders in the province (i.e., species richness). The calculation was made as follows:

$$\text{Level of Endangerment (\%)} = \frac{\text{No. of Species and Subspecies at Risk in Class or Order}}{\text{Overall Species Richness of Class or Order}}$$

We used the online B.C. Species and Ecosystem Explorer (Government of B.C.) to obtain available conservation status ranks for wildlife in B.C. (available at: http://srmapps.gov.bc.ca/apps/eswp/). Ranks were assessed during the month of May 2006. The species richness of various biological classes or orders was determined from published taxonomic checklists of known species and subspecies for the province (see Appendix 2; available at: *http://www.davidsuzuki.org/WOL/Publications.asp).*

The CDC assigns conservation status ranks in a province (S ranks) on a scale from one through five, using a standardized methodology developed by NatureServe (Table 1). The levels range from critically imperilled (S1) to secure (S5). Species that are no longer found in the province (presumed either extinct or extirpated) are assigned a rank of SX, whereas species that are possibly extirpated or have not been searched for are ranked SH (historical). We considered species at risk to be those organisms ranked by the CDC as presumed extinct/extirpated (SX/SH) to vulnerable (S3) levels. Though not enumerated as being at risk in this study, some species thought to be apparently secure (ranked S4) may still be of conservation concern in B.C. due to their small range or low abundance (e.g., Black Oystercatcher [*Haematopus bachmani*], declining populations (e.g., Chinook Salmon [*Oncorhynchus tshawytscha*], or vulnerability to long-term threats (e.g., Western Toad [*Bufo boreas*]) (Fraser *et al.* 2004).

BRITISH COLUMBIA'S BIOLOGICAL RICHNESS

British Columbia is the most biodiversity rich province in Canada, containing 66 % of the country's known butterfly species, 70 % of its freshwater fish species, 76 % of its bird species, 60 % of its conifer species, 56 % of its fern species, and 41 % of its orchids. The remarkable biological richness of the province (Fig. 1) can be attributed to its great climatic and geographic diversity (Bunnell *et al.* 2004). For example, the province's rugged topography creates highly variable terrain, resulting in wide ranges in elevation and environmental conditions within relatively small spatial areas (e.g., from forested valley-bottoms to arctic-like alpine within a few square kilometres). The resulting

TABLE 1. DEFINITIONS FOR INTERPRETING CONSERVATION DATA CENTER (CDC) CONSERVATION RANKS.

Rank	Conservation Status	Definition
SX	Presumed Extirpated	Species is believed to be extirpated from the province. Not located despite intensive searches of historical sites and other appropriate habitat, and virtually no likelihood that it will be rediscovered.
SH	Possibly Extirpated	Species occurred historically in the province, and there is some possibility that it may be rediscovered. Its presence may not have been verified in the past 20-40 years.
S1	Critically Imperiled	At extreme risk of extirpation from the province because of extreme rarity (often 5 or fewer occurrences) or because of some factor(s) such as very steep declines.
S2	Imperiled	At high risk of extirpation from the province because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors.
S3	Vulnerable	At moderate risk of extirpation from the province due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors.
S4	Apparently Secure	Uncommon but not rare in the province; some cause for long-term concern due to declines or other factors.
S5	Secure	Common, widespread, and abundant in the province.
SNR	Unranked	Conservation status not yet assessed in the province
SNA	Not Applicable	Conservation status is not applicable because the species is not a suitable target for conservation activities (e.g., exotics).
SU	Unrankable	Currently unrankable due to lack of information or due to substantially conflicting information about its status or trends.

Note: CDC reports range ranks (e.g., S1S2) when there is uncertainty about the conservation status of a particular species. In this study range ranks were rounded to the higher rank (i.e., S1 in the example) or averaged (S2S4 to S3). The original range rank for each species can be obtained from the B.C. Species and Ecosystem Explorer. Available at http://srmapps.gov.bc.ca/apps/eswp/

geographic diversity begets an enormous variety of habitat types (from temperate rainforest to desert) which allow thousands of species to exist in the province. Much of this diversity is globally unique. For example, at least 37 endemic species in the province are at risk of extinction in B.C. (see Appendix 3; available at: *http://www.davidsuzuki.org/WOL/Publications.asp)*, meaning that B.C. has a global responsibility for their conservation. Endemic species are particularly vulnerable to extinction since their populations are usually small in numbers, and they are often restricted to small areas of geography (Fraser 2000). The global range of hundreds of more species is found mostly or almost exclusively in B.C., so that extirpation from the province would have global implications as well. This includes many large carnivores in B.C. (e.g., Grizzly Bear [*Ursus arctos horribilis*], Gray Wolf [*Canis lupus*]), which have been largely eliminated from most of their historical range elsewhere.

EVIDENCE OF WIDESPREAD SPECIES ENDANGERMENT

Our review of wildlife tracked and listed by the CDC indicates that at least 1348 native terrestrial and freshwater species are currently threatened or endangered in British Columbia. This number is a significant underestimate of the total number of species at risk thought to occur in the province, as it does not include hundreds of species which we excluded from our analysis for methodological reasons (e.g., non-vascular plants, marine species, distinct populations at risk and others; see Appendix 1; available at: http://www.davidsuzuki.org/WOL/Publications.asp).

Though species at risk are found throughout British Columbia, most are clustered into four main "hotspots" in the province – the south island region of Vancouver Island, the Lower Mainland of southwestern British Columbia, the southern Rocky Mountain Trench and the

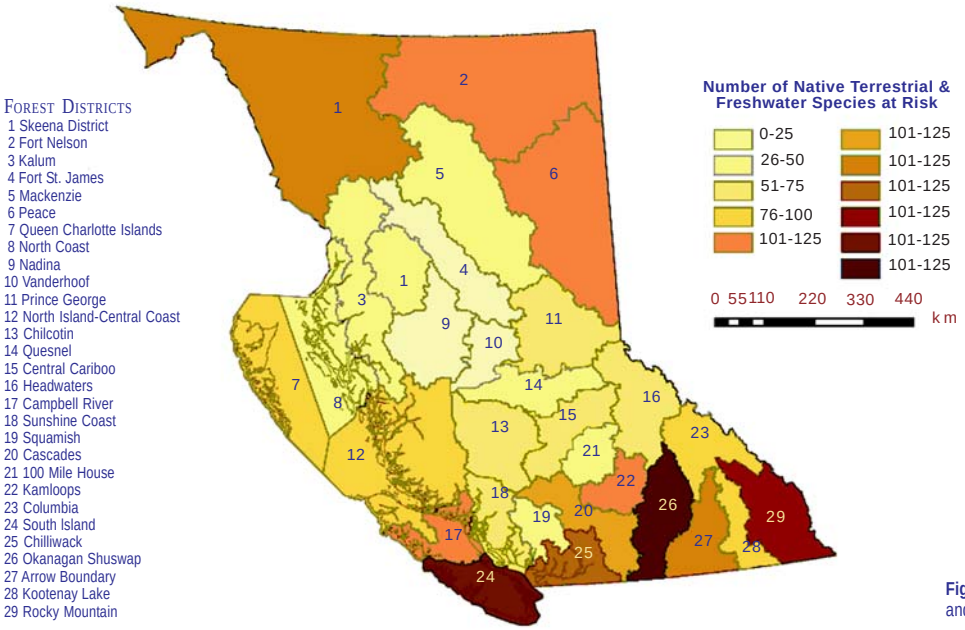

Figure 2. The geographic distribution of native terrestrial and freshwater species at risk in British Columbia

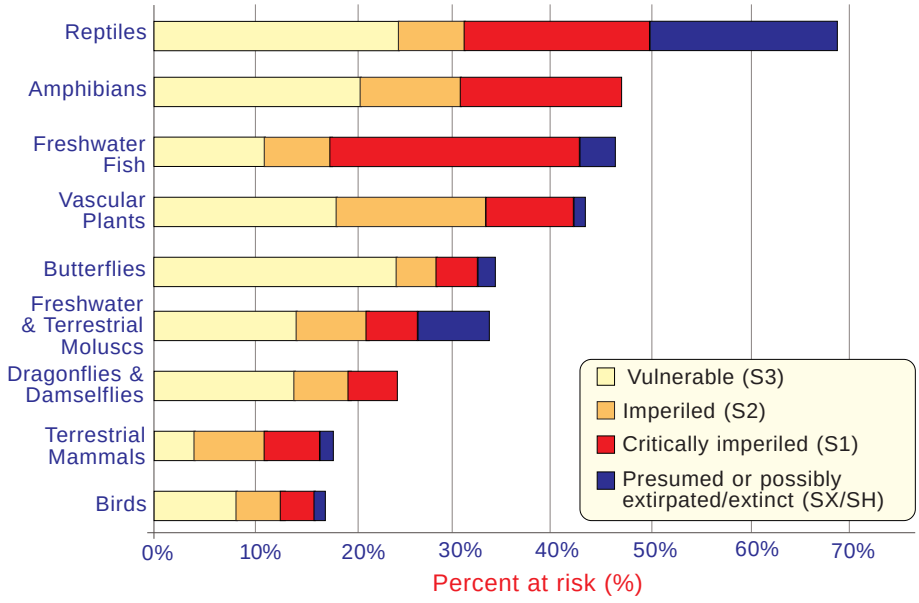

Figure 3. Estimated levels of species endangerment in British Columbia (as percentage of known species and subspecies). The relative proportion of species and subspecies at risk within major biological classes or orders in B.C. The total number of species and subspecies at risk (ranked SX – S3 by NatureServe) / number of species and subspecies in each class or order is: reptiles 10/15; amphibians 9/19; terrestrial mammals 46/261; birds 86/504; vascular plants 1014/2347; freshwater fish 42/89; freshwater and terrestrial molluscs 49/147; dragonflies and damselflies 22/86; and butterflies 70/204. Estimates exclude species at risk in the following categories: populations, marine species, non-vascular plants, accidentals, exotics or introduced species, and species listed as no status by the B.C. Conservation Data Center. A full list of species at risk excluded in the analysis is given in Appendix 1. For a description of the risk categories, see Table 1. Source B.C.

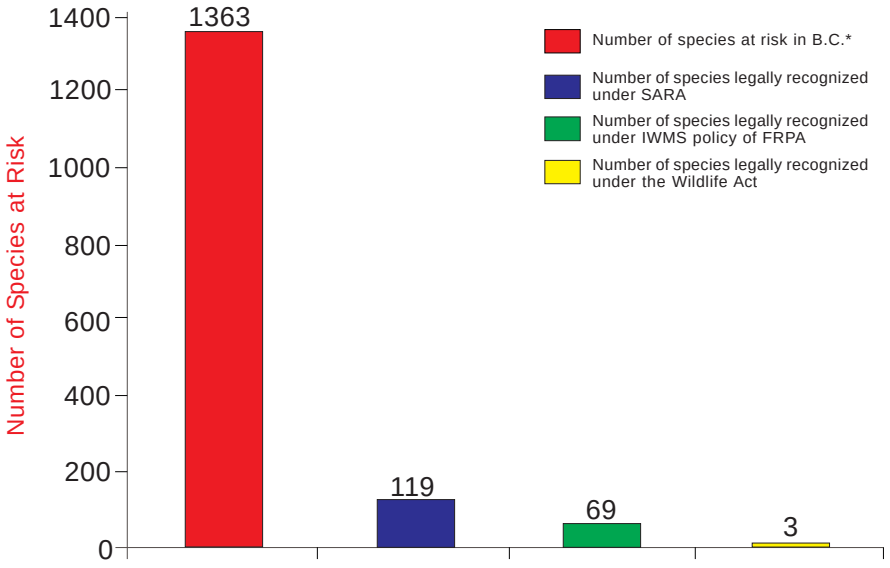

Figure 4. Levels of legal protection for native terrestrial and freshwater species and subspecies in British Columbia.- The number of native terrestrial and freshwater species and subspecies at risk in B.C. that are legally recognized under federal law (Species at Risk Act; SARA) or provincial wildlife legislation (IWMS: Identified Wildlife Management Strategy of the Forest Range and Practices Act; or the Wildlife Act). Eighty-seven % of known threatened or endangered species in B.C. are not protected under provincial or federal laws that contain prescriptions for species at risk. Source: B.C. Conservation Data Center. Includes all known species at risk in B.C. (species, subspecies, and populations).

TABLE 2. CONSERVATION STATUS OF NATIVE TERRESTRIAL AND FRESHWATER SPECIES AND SUBSPECIES IN BRITISH COLUMBIA.

Status in British Columbia	Amphibians	Birds	Freshwater Fish	Terrestrial Mammals	Reptiles &Turtles	Butterflies	Dragonflies & Damselflies	Freshwater & Terrestrial Molluscs	Vascular Plants	Total Number of Species	Percentage of Total (%)
Presumed Extinct or Extirpated (SX)	0	4	3	1	3	2	0	1	4	18	0.5%
Possibly Extirpated (SH)	0	0	0	2	0	1	0	10	18	31	0.8%
Critically Imperiled (S1)	3	15	23	12	2	7	5	5	203	275	7.5%
Imperiled (S2)	2	23	6	15	1	9	5	12	347	420	11.4%
Vulnerable (S3)	4	44	10	16	4	51	12	21	442	604	16.4%
Apparently Secure (S4)	7	107	18	22	3	40	17	24	656	894	24.3%
Secure (S5)	3	120	24	51	2	91	47	68	677	1083	29.5%
Other (SNR, SU, SNA or non-CDC source)	0	191	5	142	0	3	0	6	0	347	9.4%
Total Richness	19	504	89	261	15	204	86	147	2347	3672	

Notes: (1) The table shows the conservation status of native terrestrial and freshwater species and subspecies within major biological classes or orders in British Columbia. All tallies exclude species at risk in the following categories: populations, marine species, non-vascular plants, accidentals, exotics or introduced species, and species listed as no status by the B.C. Conservation Data Center. A full list of species at risk excluded in the analysis is given in Appendix 1. Source: B.C. Conservation Data Center; (2) See Table 1 for a definition of each conservation status rank. CDC reports range ranks (e.g., S1S2) when there is uncertainty about the conservation status of a particular species. In this report range ranks were rounded to the higher rank (i.e., S1 in the example) or averaged (S2S4 to S3). The original range rank for each species can be obtained from the B.C. Species and Ecosystem Explorer. Available at http://srmapps.gov.bc.ca/apps/eswp/; (3) "Other" category includes species that have not yet been ranked by the CDC (SNR), currently unrankable (SU), species that are unsuitable for conservation ranking (SNA) as well as species and subspecies missing from CDC databases, but included in provincial standard taxonomic checklists (i.e., non-CDC source; see Appendix 2).

Okanagan Valley (Fig. 2). Some species at risk in these regions are at the outer extent of their range, making them particularly vulnerable to decline from anthropogenic impacts (Fraser 1999; Bunnell & Squires 2004)). In addition, extensive areas within these "hotspots" have been intensively impacted by human land-use and other associated threats (Bunnell *et al.* 2004). For example, the Lower Mainland, southern Vancouver Island and the Okanagan Valley have higher human population densities relative to other regions in the province. This has resulted in habitat loss from industrial development (e.g., urbanization, intensive agriculture), over-exploitation of native biodiversity (e.g., over-fishing and over-hunting), as well as the introduction of numerous invasive species.

Our analysis indicates that a large proportion of known amphibians, reptiles and turtles, freshwater fish and vascular plants are at risk of disappearing from the province (> 40 % at risk of extirpation or extinction, Fig. 3 and Table 2). These numbers are particularly troubling given the relatively lower richness of some of these classes (e.g., reptiles and turtles; amphibians) and the fact that the Canadian range for many of these species is found mostly in B.C. (Bunnell & Squires 2004). The regional plight of amphibians in B.C. is consistent with global trends elsewhere, which indicate that at least a one-third of frogs and salamanders worldwide are threatened with extinction (Young *et al.* 2004). Unlike these species, butterflies, terrestrial and freshwater molluscs, dragonflies and damselflies, terrestrial mammals and birds exhibit a lower level of species endangerment in the province (< 30 % at risk of extirpation or extinction, Fig. 3 and Table 2). Nonetheless, a number of important mammals and birds

Figures 5-17 (opposite page). 5, Behr's Hairstreak is a small butterfly dependent on one of the most endangered ecosystems in Canada, the antelope brush habitat of the southern Okanagan; 6, River Jewelwing, female (Jewelwing, male, see front cover); 7, The Gyrfalcon, North America's largest falcon, overwinters in B.C. before migrating North to the Arctic tundra to nest; 8, Eighty percent of the world's Cassin's Auklet population nests in Canada, with more than half of these found on Triangle Island, B.C.; 9, Cassin's Auklet chick; 10, The night snake only exists in a small area of southern B.C. This rare, endangered reptile at less than one metre long, occupies rocky areas arid habitats; 11, Once abundant across the province's native grasslands, today Blue Grama- a very drought resistant grass species- only occupies seven sites, four within the Rocky Mountain Trench; 12, Redwood Sorrel is an endangered vascular plant that is native to B.C.'s southern Vancouver Island and Haida Gwai; 13, The Northern Leopard Frog currently exists in only one location of the Kootenays, making it one of the most at risk species in B.C.; 14, Wolverine; 15, Named for its incredible ability to leap as a means of avoiding predators, the Dromedary Jumping Slug is native to B.C.'s west coast forests and to date only occupies six localities on southern Vancouver Island; 16, Grizzly Bear cub, B.C. is currently home to nearly half of Canada's Grizzlies; 17, Green Sturgeon. All illustrations © *Brenda Guild*.

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are threatened or endangered, including the Mountain Caribou (*Rangifer tarandus*) and many raptors (e.g., Northern Goshawk [*Accipiter gentilis laingi*], and Swainson's Hawk [*Buteo swainsoni*]).

BRITISH COLUMBIA'S CASUALTY LIST: HISTORIC AND LOOMING LOCAL EXTINCTIONS

British Columbia has lost 49 known species and subspecies since presettlement (see Appendix 3; available at: http://www.davidsuzuki.org/WOL/Publications.asp). Four of these species are extinct globally (e.g., Dawson Caribou [*Rangifer tarandus dawsoni]*, Passenger Pigeon [*Ectopistes migratorius*]). The rest have been extirpated, meaning that although absent from the province today, they are found elsewhere within their global range. A further 7.5 % of species we examined are critically imperilled (S1) and thus are at extreme risk of being eliminated in short order (Table 2). Though some of these species may not be as vulnerable outside of B.C. (e.g., Fringed Pinesap [*Pleuricospora fimbriolata*]), extirpation from the province can have serious genetic and ecological consequences for the species. For example, the loss of genetically unique populations of salmon (e.g., Cultus lake sockeye salmon [*Oncorhynchus nerka*]) reduces the overall gene pool of the species (Fraser 1999). Genetic diversity is important, as it is a critical means by which species respond to environmental change (including climate change) through adaptation. The loss of the southern Mountain Caribou [*Rangifer tarandus*], a critically imperilled population of woodland caribou, will have negative ecological implications (e.g., trophic relationships) in the interior rainforests where remnant populations are still found.

THE INEFFECTIVENESS OF EXISTING WILDLIFE PROTECTION LAWS

British Columbia is one of only two provinces in Canada without stand-alone endangered species legislation. While the province does maintain lists of species thought to be threatened or endangered, this triggers no legal protection. Since 1980 the province has identified over 1300 species at risk, of which only four have been legally listed and thus are entitled to the very marginal protections afforded by British Columbia's Wildlife Act (1996).

In May 2004 the government amended the Wildlife Act to clarify authority for designating species as threatened, endangered or extirpated, and provide prohibitions against the killing, trading, trafficking and transport of species and protection for their residence (Wildlife Amendment Act 2004). The BC government apparently did so to forestall application of federal endangered species legislation in its jurisdiction (the Species at Risk Act (2002)). However, no species were listed at the time, so BC's law remains in limbo. The amendments maintain all the existing discretionary powers of the previous legislation, do not require habitat protection and do not require recovery planning. The law provides little legal mandate to protect and recover threatened and endangered species.

Our review finds that 86 percent of known threatened and endangered species (native terrestrial and freshwater) in British Columbia are not legally recognized under provincial or federal legislation and are thus not protected under BC's laws or policies that contain prescriptions for species at risk (the IWMS policy of the Forest Range and Practices Act and the Wildlife Act) or under federal endangered species legislation (Species at Risk Act) (Fig. 4). We can conclude that the vast majority of BC's species at risk currently remain wholly unprotected by law.

CONCLUSION

In the 1987 report of the World Commission on the Environment and Development, Our Common Future (*the "Bruntland Report"*), the Bruntland Commission noted:

> *National and international law has traditionally lagged behind events. Today, legal regimes are rapidly outdistanced by the accelerating pace and expanding scale of impacts on the environmental base of development. Human laws must be reformulated to keep human activities in harmony with the unchanging and universal laws of nature.* (World Commission on Environment and Development 1987).

It is not coincidence that pervasive species endangerment in British Columbia is correlated with a highly flawed regulatory regime, most notably the absence of endangered species legislation. Recognizing the critical importance of biodiversity to ecosystem integrity and human well-being, at risk species and their habitat warrant legal protection in the province. Research of species at risk legislation in other jurisdictions (e.g., U.S. Endangered Species Act) and best practices shows that a strong endangered species law must be based on the following key principles:

1. enshrine the principle that healthy ecosystems are essential to healthy human societies and economies;
2. recognize that biological diversity is essential to healthy ecosystems;
3. identify, protect and recover at risk biodiversity throughout the province;
4. protect and recover biodiversity by protecting habitat;
5. identify, assess and develop recovery strategies for at risk biodiversity on the basis of sound science;
6. enshrine the precautionary principle, the principle of intergenerational equity; and the polluter-pays

principle;
7. require citizen, community and First Nations (i.e., Indigenous Peoples) participation (including opportunities for citizen legal action);
8. require accountability and transparency;
9. be funded; and
10. be enforced

Legislation in British Columbia that incorporates the above key principles would provide the legal means for the effective protection and recovery of species at risk in Canada's most biologically rich region, and thereby fulfill the province's moral, national and international responsibilities for the conservation of its irreplaceable natural heritage.

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