

SPECIES AT RISK

HIGH CONSERVATION VALUE 1, QUESTION 1

Does the forest contain species at risk or potential habitat of species at risk as listed by international, national or territorial/provincial authorities?

BACKGROUND

The term 'species at risk' is widely used in Canada to variously refer to species that are known or considered to be endangered, threatened, of special concern, vulnerable, rare, or extirpated (not extinct, but no longer extant in Canada in the wild). While additional terminology exists depending on the classification system in use, these are the most commonly used terms that classify species at levels of risk. In Canada, geographically isolated or identifiable populations, as well as disjunct or range edge populations can be listed as at risk (separate from other, healthier or less threatened populations of the same species). For example, the national science body for ranking species in Canada (Committee on the Status of Endangered Wildlife in Canada (COSEWIC)) has variously ranked populations of Beluga Whale in Canada as endangered, threatened or special concern depending on a range of factors, including levels and rates of population decline from historical levels and recovery potential in relation to current assessments of threat.

Species at risk warrant special attention in management planning because these are the most vulnerable and/or irreplaceable elements of biodiversity. Species may be at risk due to human caused factors or they may be naturally rare in the landscape. In either circumstance, if their ecological requirements are not addressed, they are at risk of becoming further threatened. While forest management practices may not be directly responsible for a species being listed as 'at risk', it is nonetheless important that forest practitioners are aware of the species if it occurs or has the potential to occur in appropriate habitat in their license area. Subsequent to HCVC assessment and appropriate management planning, steps should be taken to monitor its population levels in order to determine whether further decline is detected.

Depending on the level of risk attributed to a species or population, a single species at relatively high risk or concentration of species at various levels of risk may constitute a HCVC and the habitats in which they occur, especially habitat components considered to be critical to the species survival, should be considered as HCVCs.

Species at risk that are not, ultimately, designated as HCVCs are still afforded special management strategies under the requirements of Criterion 6.2.

DATA SOURCES

Global/International:

- CITES (Appendix I, II, and III)
- IUCN red data list
- Conservation Data Centre G1 and G2 element occurrences

National:

- Species designated as endangered, threatened or special concern by COSEWIC (see: http://www.speciesatrisk.gc.ca/search/speciesRes ults_e.cfm)
- Conservation Data Centre N1 and N2 element occurrences

Regional:

- Provincial/Territorial Government lists (*e.g.* in Ontario consult the Species at Risk in Ontario (SARO) list: <http://www.ontarioparks.com/saro-list.pdf>)
- Provincial/Territorial Conservation Data Centre S1 and S2 element occurrences (*e.g.* in Ontario go to <http://www.mnr.gov.on.ca/MNR/nhic/nhic.cfm>; in Alberta go to <http://www.cd.gov.ab.ca/preserving/parks/anhic/fl ashindex.asp>; in Quebec go to <http://www.cdpnq.gouv.qc.ca/index-en.htm>; in Saskatchewan go to <http://www.biodiversity.sk.ca/>)
- General Status of Wild Species reports on the year 2000 provincial, territorial and national status assessments of Canadian birds, mammals, reptiles, amphibians, freshwater fishes, butterflies, orchids and ferns (<http://wildspecies.ca/wildspecies2000>). The document is set to be revised and updated in 2005 with proposed additions including marine fishes, crayfish, tiger beetles, dragonflies, freshwater mussels, and all vascular plants (Natural Heritage Information Centre Newsletter, Ontario Ministry of Natural Resources, Vol. 10, No.1, Winter 2005).
- Provincial Breeding Bird Atlases now exist for most provinces. For example, Ontario is currently in the final year of its second 5-year assessment (2001-05), the first survey was conducted from 1981-1985 (see <http://www.birdsontario.org/atlas/atlasmain.html>).
- Some provinces have also completed mammal and reptile/amphibian atlases

Data sources for digital mapping of species distribution include:

- NatureServe (bird and mammal distributions; see <http://www.natureserve.org/getData/birdMaps.jsp> <http://www.natureserve.org/getData/mammalMap s.jsp>)
- Regional CDCs (*e.g.* Ontario Natural Heritage Information Centre; see [see](#) websites listed above)
- USGS Trees of North America (see <http://climchange.cr.usgs.gov/data/atlas/little/>)
- COSEWIC listed species (see http://www.speciesatrisk.gc.ca/search/speciesRes ults_e.cfm)

HCV1 Q1 – SPECIES AT RISK

Figure 1.1 Sample output from the WWF-Canada HCV1 species database application summarizing the translation of various Species at Risk rankings into HCV recommendations. The details of this translation is provided in the Methodology section

Summary	Species at Risk	Taxonomic Group	Nature Audit	COSEWIC	NatureServe	IUCN
HCV	BOG ADDER'S-MOUTH (MALAXIS PALUDOSA)	VASCULAR PLANTS	HCV			
HCV	AMERICAN YELLOW LADY'S-SLIPPER (CYPRIPEDIUM PARVIFLORUM)	VASCULAR PLANTS	HCV			
HCV	GIANT RATTLESNAKE-PLANTAIN (GOODYERA OBLONGIFOLIA)	VASCULAR PLANTS	HCV			
Possible	MONARCH (DANAEUS PLEXIPPUS)	ARTHROPODS		Possible		
Possible	RED-SHOULDERED HAWK (BUTEO LINEATUS)	BIRDS	Possible	Possible		
Possible	RED-HEADED WOODPECKER (MELANERPES ERYTHROCEPHALUS)	BIRDS	Possible	Possible		Possible
Possible	OLIVE-SIDED FLYCATCHER (CONTOPUS COOPERI)	BIRDS	Possible			Possible
Possible	SHORT-EARED OWL (ASIO FLAMMULUS)	BIRDS	Possible			
Possible	BAY-BREASTED WARBLER (DENDROICA CASTANEA)	BIRDS	Possible			
Possible	AMERICAN BLACK DUCK (ANAS RUBRIPES)	BIRDS	Possible			
Possible	CANADA WARBLER (WILSONIA CANADENSIS)	BIRDS	Possible			
Possible	TRUMPETER SWAN (CYGNUS BUCCINATOR)	BIRDS	Possible			
Possible	GOLDEN-WINGED WARBLER ()	BIRDS				Possible
Possible	YELLOW RAIL (COTURNICOPS NOVEBORACENSIS)	BIRDS		Possible		
Possible	SATYR COMMA (POLYGONIA SATYRUS)	BUTTERFLIES AND SKIPPERS	Possible			
Possible	KIYI (COREGONUS KIYI)	FRESHWATER FISHES		Possible		Possible
Possible	NORTHERN BROOK LAMPREY (ICHTHYOMYZON FOSSOR)	FRESHWATER FISHES		Possible		
Possible	PUMA (PUMA CONCOLOR)	MAMMALS	Possible			
Possible	AMERICAN MARTEN (MARTES AMERICANA)	MAMMALS	Possible			
Possible	WOOD TURTLE (CLEMMYS INSULPTA)	REPTILES		Possible		Possible
Possible	WHITE-FRIDGE ORCHIS (PLATANHERA BLEPHARIGLOTTIS)	VASCULAR PLANTS	Possible			
Possible	NORTHERN TWAYBLADE (LISTERA BOREALIS)	VASCULAR PLANTS	Possible			
Possible	ROUND-LEAVED ORCHIS (AMERORCHIS ROTUNDIFOLIA)	VASCULAR PLANTS	Possible			
Possible	RAM'S-HEAD LADY'S-SLIPPER (CYPRIPEDIUM ARIETINUM)	VASCULAR PLANTS	Possible			

INTERPRETING GLOBAL, NATIONAL AND REGIONAL SIGNIFICANCE

It is important to consider the global, national and regional context of a species or population at risk. For most listed species at risk, maintaining all remaining meta-populations (including those at the regional level where populations may be stable and healthy) is important for preventing further decline and ultimately, to provide opportunities for recovery.

Inclusion of international and national rankings is especially important since a listed species may be locally common, perhaps even abundant even as it is in decline in other significant parts of its range. In these cases it is possible that the healthiest populations are restricted to a region that includes the license area, which could confer a special responsibility on the forest practitioners to maintain the health of the regional population.

Alternatively, some species may be regionally at high risk or even extirpated while populations elsewhere in its range may be stable. Efforts to help recover the species at the regional level would assist in preventing the species from potentially undergoing further decline. Depending on the specific circumstances (e.g. a species that is a top predator or important ungulate) recovery of local populations may help to improve the ecological

integrity of the regional forest system in a manner that is beneficial to tree regeneration (reduced browse from small mammals with re-introduction of predators) or community recreational benefits (restored hunting/fishing opportunities).

INTERPRETING THE PRECAUTIONARY PRINCIPLE

Species listed as 'at risk', regardless of specific level of threat, have a greater probability of being negatively influenced, either directly or indirectly, by anthropogenic factors that alter the natural composition or evolutionary processes of their native landscapes.. Collectively, species at risk are therefore often seen as among the most sensitive indicators of ecologically unsustainable activities in the forest.

Species at risk merit careful consideration in selecting HCVs, especially since many species that are rare may not have been well surveyed in much of the boreal. Many plants and insects, in particular, may not be well documented. In these cases, it would be prudent to identify habitats within the forest license area that could potentially support populations of these species, either for recovery purposes or to increase survey efforts for these species if they are less well known. This is especially true of any species that continues to show evidence of population decline or range retraction. Regardless of its specific at risk status, the

HCV1 Q1 – SPECIES AT RISK

HCV status of these species should be carefully considered.

In those cases where sites could support active recovery efforts, they should be identified as HCVFs and management practices should be designed that help restore or conserve habitat conditions necessary for population maintenance or re-introduction. An example of such a measure is the work being undertaken in Manitoba (Pine Falls) to ensure adequate conifer regeneration in order to ensure a future supply of habitat blocks for a small herd of woodland caribou.

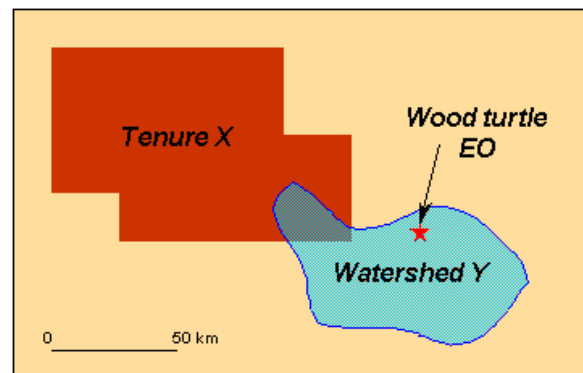
Concentrations of species at risk in the boreal (e.g. orchids, turtles, dragonflies, waterfowl) are often associated with various wetland habitats (bogs, fens) nested within the forested landscape. Although unlikely to be directly influenced by forestry activities, these sites may be indirectly impacted through location of nearby logging roads, winter roads, and increased human access. It is therefore important to also identify these non-forested habitats as HCVFs to flag their regional importance and to ensure that indirect effects of forestry operations do not compromise their ecological integrity.

ADDITIONAL GUIDANCE

In order to assist with the identification of species at risk that could potentially occur within a forest licence area, WWF has assembled a regional database using the framework of the Terrestrial Ecoregions of Canada (Figure 1.1 illustrates sample output for Ecoregion 97, the Lac Temiscamingue Lowland). Species (most vertebrates with some examples from other taxonomic groups) in each region have been categorized as either qualifying for HCV status (if also present in the licence area) or as possible HCVs that will require further assessment relative to their status within the licence area. Some of these 'possible HCVs' could then also be elevated to the status of HCVs (either individually or where concentrations of species exist). Generally speaking, species that have been assessed as being at a higher level of risk (e.g. endangered, threatened status) among different assessment protocols are most likely to qualify as HCVs. Classification within all at risk protocols is reflective of changes to population and abundance levels as well as overall contraction of range area. For more details on how HCV thresholds were determined, see the methodology section of this document.

Because a forest licence area will usually overlap only a portion of a terrestrial ecoregion and may, in fact, overlap parts of several regions, the species lists generated in the look-up table are only meant to provide guidance with respect to the generation of a comprehensive species at risk list. We suggest that HCVF assessments use the regional lists generated by this tool as a starting point for consideration of HCVs under this indicator. For each species listed (both proposed HCVs and possible HCVs) for the region, a rationale specific to its status in the licence area should be provided relative to its final determination as an HCV or not.

Figure 1.2 Location of the hypothetical wood turtle element occurrence relative to the forest tenure in question.



Please note that this table is still under development. Presently, it includes COSEWIC listings, IUCN Red List data, and summarizes species information from The Nature Audit, a report that WWF released in 2003. We anticipate adding new fields into the table that reflect the Natureserve G, N, and S ranks. Until information from other ranking systems are included in the table, the forest practitioner should ensure that these data sets are also considered in their assessment.

Examples

Species with well defined natural history requirements – Wood Turtle (*Clemmys insculpta*)

Many species of reptiles, both globally and in Canada, have conservative life history strategies and populations that are in decline. Many species have relatively low reproductive rates; adults are long-lived and slow to reach sexual maturity. Loss of adults and juveniles can create a rapid decline in local population levels. Specific threats include changes to habitats that increase their vulnerability to mortality on roadways, loss of natural foraging habitat adjacent to waterways, illegal collection of adults for the pet trade and increased predation levels on eggs and young juveniles from raccoons, skunks, etc. where populations of these species have increased in the landscape (often in response to habitat changes as a result of human encroachment).

Wood turtle, specifically, is listed by COSEWIC as Special Concern, and by IUCN as Vulnerable, and is therefore shown as a possible HCV in the WWF-Canada HCV1 database (Figure 1.1).

Generalized range maps show that this species' range potentially overlaps the (hypothetical) tenure in question. Known and historical population information for wood turtle indicates that the species' range overlaps the tenure, but that the distribution in Ontario is highly fragmented. This means that if any one population is extirpated, there is a low probability of re-establishment through the 'rescue effect' from neighbouring populations.

HCV1 Q1 – SPECIES AT RISK

Figure 1.3 Delineation of the critical habitat zone for wood turtle is defined using a 300m buffer around all streams (Avisais *et al.* 2002)

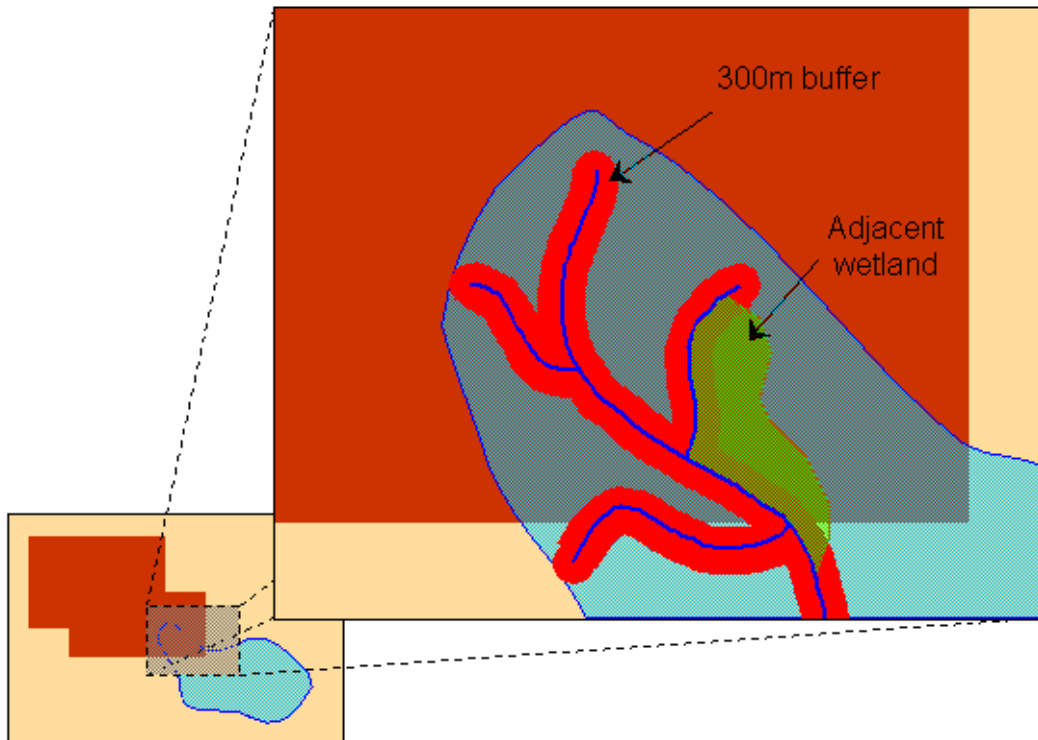
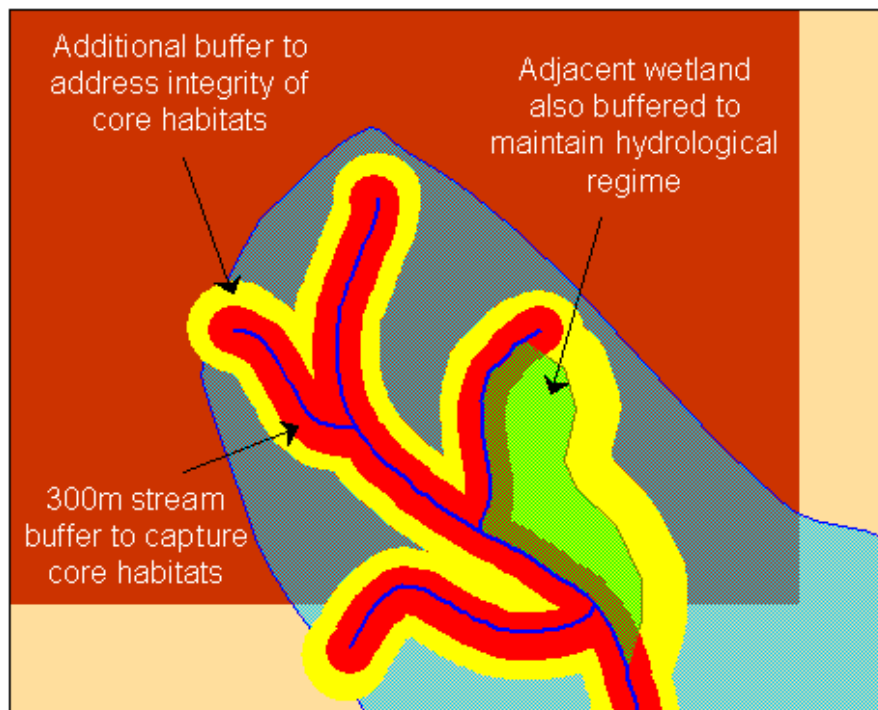


Figure 1.4 The proposed HCVF zone design guidelines incorporates buffers around all critical habitat and wetlands to maintain the integrity of these areas.



HCV1 Q1 – SPECIES AT RISK

Specific occurrences of wood turtle in Ontario are tracked by the Natural Heritage Information Centre (http://nhic.mnr.gov.on.ca/nhic_cfm), but the distribution of these occurrences may not be comprehensive. In general, element occurrence data tend to be biased towards areas that are easily accessible and commonly travelled, and suffer from greatly uneven survey effort, particularly in the boreal. Absence of element occurrence data does not necessarily mean absence of the species. Similarly, special management of an element occurrence “point” does not necessarily ensure that the critical habitat components sustaining that occurrence are maintained. Some attempt to note past survey effort may help determine the need to document an extended ‘potential’ distribution.

In this fictitious example, there is only a single occurrence, located just outside the tenure, but within a watershed that it intersects (Figure 1.2). The first step is to map out the watershed encompassing known occurrence.

Life history attributes, population/range area trends, potential threats and critical habitat requirements need to be compiled for each candidate HCV species to determine what spatial areas on the tenure may need to be delineated as HCVF zones. Consultation with local/regional biologists and a review of the literature should assist with assemblage of this information and its application to the forest tenure under investigation.

In the case of wood turtle, Arvisais *et al.* (2002), working with populations of wood turtles in the Mauricie region of Québec, identified a 300 m buffer around streams as sufficient to capture all critical habitat over a two-year period (Figure 1.3).

Major differences in habitat types within this critical area need to be distinguished so that differences in management prescriptions that could impact the ecological integrity of these sites can be addressed. Figure 1.4 illustrates proposed HCVF zone design guidelines and management options. Specific proposals include:

- All streams, wetlands and buffers are considered possible HCVFs
- Additional buffering to the 300 m core may be needed to reduce or minimize threats to wood turtle habitat.
- No roads in 300 m core buffers that border all waterways in the watershed where wood turtles have been recorded.
- No roads or other activity in wetlands or adjacent areas that could alter hydrological conditions
- Careful consideration of roads in the areas demarked by yellow buffers as they may create impacts on the integrity of the core habitat areas and potentially allow for increased access to wood turtles by collectors for the illegal pet trade. Any harvest in these areas should be of a nature that maintains the quality of the 300 m core area.
- Note that buffers need to be wider next to wetlands as these habitats are especially vulnerable to changes in hydrological conditions.

- Any seasonal activity should be timed to avoid turtle activity.

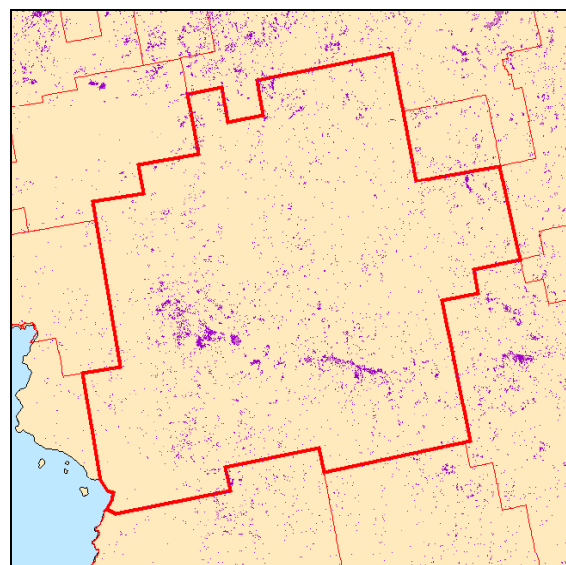
Species with less well-defined natural history requirements and/or knowledge of its population distribution – Bog Adder’s Mouth (*Malaxis paludosa*)

This is a typical species for which the precautionary principle needs to be considered. Bog adder’s mouth is a small, inconspicuous bog orchid. It is almost certain that all occurrences have not been mapped and, in fact, the majority of populations may be unknown. This is the case with many cryptic species. While not listed by IUCN or COSEWIC, bog adder’s mouth is categorized by NatureServe as S1 in Ontario, Manitoba, Saskatchewan and Alberta, and was identified as a likely HCV by the Nature Audit species evaluation (Figure 1.1).

Range maps are often not available for such inconspicuous species or species difficult to identify. Known occurrences within an ecoregion can provide some evidence that the species may be locally present in suitable habitat. In lieu of recent surveys, the precautionary principle should be applied to help guide management planning where activities may impact suitable habitats (possible HCVFs).

A good first step in considering possible HCV species occurrences within a tenure is to look for records in the ecoregion within which a tenure is located and then look for potentially suitable habitats that could support populations of the species being investigated. Figure 1.5 illustrates the distribution of potentially suitable habitat for bog adder’s mouth based on remotely sensed land cover data selecting open and treed bogs. These areas could be considered as possible HCVFs until further survey work is undertaken.

Figure 1.5 Distribution of potentially suitable habitat for bog adder’s mouth, *Malaxis paludosa*, in a hypothetical tenure (based on Land Cover 2000 Open and Treed Bogs).



HCV1 Q1 – SPECIES AT RISK

While there is a higher probability that the orchid may be found in areas of higher concentrations of suitable habitats (*e.g.* the linear concentration of wetlands in the lower-central part of the fictitious tenure pictured in Figure 1.5), with naturally occurring rare species there is no guarantee that this will be the case. It is entirely possible that if they do occur in the tenure, it could be in any of the wetlands, even some of the more isolated and smaller habitat sites and that they would not, in fact, be found in the areas of concentrated suitable habitat. In a situation where a species distribution is thought to be poorly known, all occurrences of suitable habitat should remain as possible HCVFs. While there may be a temptation to parcel out a subset of sites as possible HCVFs (*e.g.* concentrated areas of suitable habitat) and eliminate the remainder for consideration prior to site-by-site inspection, this would be a premature move and would not be seen as consistent with the precautionary principle.

Habitat preferences for all likely or possible HCV species should be identified prior to the process of delimiting HCVFs. This is because some habitats or combinations of habitats may emerge as critical for a group of species, hence making the HCVF identification process more efficient if it is conducted with all critical habitat types identified for HCV species occurring or potentially occurring in the tenure.

SUMMARY OF RECOMMENDATIONS

- Species and populations that are most at risk (endangered, threatened) almost certainly need to be recognized as HCVs. Habitat areas critical to their persistence (breeding, staging, feeding) should further be recognized as HCVFs.
- Species occurring in non-forested habitats (*e.g.* wetlands) nested within the forest licence area also qualify as HCVs. These non-forested habitats should also qualify as HCVFs.
- Most spatial data on species at risk occur as “point data” marking the occurrence of the species. Therefore, a buffer zone will need to be adequately protect the species. This buffer zone should be sized and distributed according to the habitat needs of the species in question.
- Species considered to be at somewhat lower levels of risk (*e.g.* Special Concern, Vulnerable, Rare, populations in decline, but not yet formally listed) may also qualify as HCVs, particularly if they:
 - o Are presently known to be experiencing continuing population decline or range retraction (relative to historical levels)
 - o Are known to be vulnerable to changes in their habitat conditions caused directly by forestry operations and/or indirectly by its related infrastructure (*e.g.* roads, increased human access)
 - o Occur in concentration in a particular habitat or region

LITERATURE CITED

Arvisais, M., J. Bourgeois, E. Levesque, C. Daigle, D. Masse and J. Jutras. 2002. Home range and movements of a wood turtle (*Clemmys insculpta*)

population at the northern limit of its range. Canadian Journal of Zoology 80(3):402-408

World Wildlife Fund Canada. 2003. The Nature Audit: Setting Canada's conservation agenda in the 21st century. Report No. 1–2003. WWF-Canada, Toronto, Canada.

METHODOLOGY

Species at Risk Look-up Table

IUCN Data

- COSEWIC ranks were mapped directly to HCV recommendations as follows:
 - o HCV – Any taxa listed as Critically Endangered or Endangered
 - o Possible HCV – Any taxa listed as Near Threatened, Vulnerable or any category of Lower Risk

COSEWIC Data

- COSEWIC ranks were mapped directly to HCV recommendations as follows:
 - o HCV – Any taxa listed as Threatened, Endangered or Extirpated
 - o Possible HCV – Any taxa listed as Special Concern

Nature Audit Data

- Nature Audit data was originally tabulated for each Conservation Planning Region (CPR) in which a given species occurred
- HCV designation was determined on a CPR basis and then sampled down to the Ecoregion level through examination of range extents for each species
- HCV designation was determined using four qualitatively coded attributes from the Nature Audit database:
 - o Overall Abundance of the Species at Present (2000)
 - o Abundance Trend for the Species from pre-European settlement (ca. 1600) to the Present (2000)
 - o Range Extent at Present (2000)
 - o Range Trend for the Species from pre-European settlement (ca. 1600) to the Present (2000)
- Separate HCV designations were determined for abundance and range data, using the matrices illustrated in Table 1.1 and Table 1.2, respectively
- A Final HCV designation for Nature Audit data was derived through combination of the abundance and range designations using Table 1.3

Summary Rank

- A summary HCV rank was assigned based on the highest rank assigned by any of the available data sources

HCV1 Q1 – SPECIES AT RISK

Table 1.1 Matrix translating Nature Audit abundance data to HCV ranks.

		ABUNDANCE TREND FROM PRE-EUROPEAN SETTLEMENT TO 2000				
		Decreased > 50%	Decreased > 20%	No Change (± 20%)	Increased > 20%	Increased > 50%
ABUNDANCE IN 2000	Abundant					
	Common					
	Uncommon					
	Rare					

Table 1.2 Matrix translating Nature Audit range data to HCV ranks.

		RANGE TREND FROM PRE-EUROPEAN SETTLEMENT TO 2000				
		Contracted > 50%	Contracted > 20%	No Change (± 20%)	Expanded > 20%	Expanded > 50%
RANGE EXTENT IN 2000	Widespread					
	Regional					
	Restricted					
	Very Restricted					
	Extirpated	Likely HCV – Habitat Restoration				

Table 1.3 Matrix translating Nature Audit range and abundance ranks to a summary HCV rank.

		ABUNDANCE DESIGNATION		
		Likely HCV	Possible HCV	Not HCV
RANGE DESIGNATION	Likely HCV			
	Possible HCV			
	Not HCV			

= Likely HCV
 = Possible HCV
 = Not HCV