HIGH CONSERVATION VALUE FOREST ASSESSMENT REPORT

ASSESSMENT AND MANAGEMENT OF FOREST CONSERVATION BASED ON FOREST STEWARDSHIP COUNCIL® (FSC®) PRINCIPLE 9

2023 to 2028 Certification Period

Port Hawkesbury Paper LP

Liscomb River Large Landscape HCV
Guysborough, Nova Scotia

September 2023

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EXECUTIVE SUMMARY

A High Conservation Value Forest (HCV) assessment initially undertaken in 2007-08 in accordance with Principle 9 of the Forest Stewardship Council® (FSC) National Standard and updated twice since that time, has undergone a new review and update for the 2023 to 2028 certification period to the FSC National Forest Stewardship Standard. This is to ensure original HCV's are still relevant and new HCV's are captured for the next 5-year period. This re-assessment resulted in the following HCV designations. New HCV additions for the 2023-2028 certification period are highlighted in green.

HCV Category	HCV Value
CATEGORY 1 – BIODIVERSITY	
Question 1: Species at Risk	Boreal Felt Lichen Occurrences Roseate Tern Habitat Bicknell's Thrush Habitat Wood Turtle Habitat American Marten Habitat Mainland Moose Habitat Canada Lynx Habitat Rusty Blackbird Habitat New Jersey Rush Habitat Eastern White Cedar Frosted Glass-Whiskers Occurrences Vole Ears Lichen Occurrences Blue Felt Lichen Occurrences Black Ash Olive-sided Flycatcher Habitat Eastern Whip-poor-will Habitat Eastern Wood Peewee Habitat Canada Warbler Habitat Chimney Swift Habitat Common Nighthawk Habitat Black-foam Lichen Habitat Little Brown Myotis Habitat Northern Myotis Habitat Tri-colored Bat Habitat Wood Thrush Habitat Evening Grosbeak Habitat Wrinkled Shingle Lichen Occurrences
Question 2: Endemic Species	Atlantic Coastal Plain Flora Occurrences
Question 3: Seasonal Concentration of Species	PHP Watersheds Cold-water streams for salmon and trout
Question 4: Regionally Significant Species	Natural Red Spruce Stands White Elm

	Red Oak Hemlock Black Ash Jack Pine Wood Turtle
Question 5: Species Concentration at Edge of Natural Range	None identified
Question 6: Legal or Proposed Conservation Area	New provincial protected area (pending legal status) Provincial parks and reserves Provincial nature reserves Provincial wilderness areas National Migratory Bird Sanctuaries National Parks Indigenous Protected & Conserved Area Old-Growth Forest Policy 2022 PHP protected areas IBP sites & sites of ecological significance Special Management Zones Adjacent to Park Boundaries
CATEGORY 2 – LARGE LANDSCAPE LEVEL FORESTS **Question 7: Forest Landscapes for Native Species**	Barren Hill Boisdale Hills Bornish Hill Country Harbour East Bay Hills French River Hill Lake Ingonish River Isaacs Harbour River Jim Campbells Barren Masons Mountain North River Oban Petit Lake Ruiss Noir Salmon Gaspereaux Upper Liscomb River

CATEGORY 3 – RARE, THREATENED, OR ENDANGERED ECOSYSTEMS	
Question 8: Naturally Rare Ecosystems	Significant Ecosites Database Nature Conservancy's Critical Occurrences
Question 9: Ecosystems under Present and/or Future Decline	Old-Growth Forest Policy 2022
Question 10: Ecosystems Poorly Represented in Protected Areas	Conservation Area Network Gap Analysis Results
Question 11: Rare or Absent Large Landscape Level Forests	See Category 2 – Large Landscape Level Forests Connectivity Management Zones
Question 12: Unique Aquatic Ecosystems	St. Mary's River Watershed Margaree River Watershed
CATEGORY 4 – BASIC SERVICES OF NATURE	
Question 13: Water Flows for Social & Economic Activities	Legally Protected Municipal Water Supply Areas Water Supply Intake Points PHP Watersheds
Question 14: Significant Forests Providing Aquatic Ecological Services	Legally Protected Municipal Water Supply Areas Water Supply Intake Points PHP Watersheds Wetlands of Special Significance
Question 15: Forests Critical to Erosion Control	Steep Slope Areas
Question 16: Interface Forests for Fire Protection	None identified
CATEGORY 5 – BASIC NEEDS OF LOCAL COMMUNITIES **Question 17: Basic Needs / Livelihoods of Local Communities**	Cape Breton Moose Population Cold-water streams for salmon and trout Cattle Grazing Cape Breton Highlands Viewscapes Margaree & St. Mary's Watersheds Third Party Requests

CATEGORY 6 – TRADITIONAL CULTURAL IDENTITY **Question 18: Forest Areas for Traditional Cultural Identity**	Culturally significant plant areas Mi'kmaq Archaeological/Cultural Scan
Collective Overlap of High Conservation Values **Question 19: Significant Overlap of Values**	None identified

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1.0 INTRODUCTION TO PORT HAWKESBURY PAPER LP

Mill History

The Mill site owned by Port Hawkesbury Paper LP has been a fundamental component of the provincial and local economy for over 50 years. The original site was developed by Nova Scotia Pulp Limited which opened the sulphite market pulp mill in 1962. In 1971, the PM-1 newsprint machine was finished, capable of producing 190,000 mt/yr. Over the course of 20 years (1960 to 1980) Port Hawkesbury's population more than doubled; significantly influenced by job-growth provided by the mill.

In 1998, PM 2 super-calendar paper machine (SC-A++) was completed and brought into use, capable of producing 360,000 mt/yr. In 2004, StoraEnso completed the expansion of the super-calendar line with the addition of TMP (Thermo Mechanical Pulp) on Line 3. In 2007 the mill was purchased by NewPage Corporation. In 2008 the Woodlands Unit achieved FSC (Forest Management and Chain of Custody) certifications. In 2011, the hog boiler and 60MW steam turbine project were sold to NSPI. In 2012 the mill was purchased by Port Hawkesbury Paper LP at which point all resources were devoted to producing paper on the super-calendar machine. The mill directly employees over 300 people and provides an additional 400-500 jobs for woodlands contractors and suppliers.

Port Hawkesbury Paper LP is looking towards the future with exciting new projects and efficiency improvements to reduce the energy requirements of the Mill. Port Hawkesbury Paper LP with the backing of the provincial government, and sound new investments is poised to continue being a significant contributor to the provincial economy for many years to come.

Forest Utilisation License Agreement (FULA)

PHP entered into a Forest Utilization License Agreement (FULA) with the province of Nova Scotia in 2012. The length of the agreement is 20 years with renewal after the first 10 years. The FULA replaces the original 1969 Crown licence agreement held by the original mill owner. Under the provisions of the license agreement, the Province of Nova Scotia grants the company the right and responsibility to conduct all forestry activities in accordance with approved forest management plans. "Forestry activities", when used in relation to the agreement lands, means, but is not limited to, the activities of management, planning, wood supply analysis, coordination, certification, harvesting, transporting, silviculture and the construction, maintenance and decommissioning of access roads. “Forest management plan(s)” means collectively the long-term forest plans and the annual operating plans and any other forest management plan(s) as agreed to.

Forest Management Planning

Under the Forest Utilization Licence Agreement, PHP is responsible for the development of all forest management plans on licensed Crown lands. The long-term and annual operating plans must be reviewed and approved by the NSDNRR before implementation. Specific requirements regarding forest planning are articulated in the 2022 Forest Utilization License Agreement between PHP and the Nova Scotia Government.

Although the Agreement constitutes a legally binding commitment, the provincial government, as owner and manager of all resources within the Crown license area, continues to play a significant role in resource management. Provincial legislation, regulations and policies still govern:

- Indigenous Rights
- Protection of forests from natural disturbances such as fire and insect infestation.
- Mineral and petroleum rights.
- Management and control of land on inland and coastal shorelines lying below ordinary mean high-water mark.
- Control and management of wildlife related activities (hunting, fishing, and endangered species)
- Protected areas (wilderness areas), nature reserves, etc.

Rights and Regulations

The Woodlands Unit at PHP is responsible for all forest planning on company managed lands. Forest planning on company managed Crown lands are subject to the terms of the Forest Utilization Licence Agreement. It allows the company to harvest wood, perform silviculture activities, and build roads for access to the licensed area. The agreement includes the preparation of annual and long-term forest management plans, work schedules and reports. NSDNRR is responsible for land-use and resource-use decisions pertaining to the DFA.

Legislation and Regulatory Requirements

A list of all relevant legislation and regulatory requirements that relate to the DFA is included in the Woodlands' Unit Environmental Management System (EMS). The list provides details of legal requirements associated with the forest, where this information can be obtained, and how this information is systematically updated. The EMS includes a description of the forestry activities associated with specific legal requirements.

Land-base Description

PHP's Defined Forest Area (DFA) is located in the seven eastern counties of Nova Scotia. The geographic extent of the DFA is shown in Figure 1. The company manages approximately 510,342 hectares of Crown lands through a license agreement with the provincial government within the DFA.

The PHP FULA lands total 510,342 ha in the Eastern region. Crown Wilderness Areas (72,486 ha of existing and pending protected area) are protected lands which contribute to non-timber values in the forest model. Contributing to the wood basket along with the PHP FULA lands are available unlicensed crown in the Eastern region as approved by NSDNRR. Crown wood in central and western Nova Scotia are not included in this plan.

In addition to acquiring wood from PHP company managed lands, the company harvests wood from private woodland owners through short-term stumpage leases. Private wood is also procured from private suppliers that operate on private woodlands located in central and eastern Nova Scotia. Wood is purchased at roadside and the company provides competitive pricing. In addition, the company provides silviculture services and training in sustainable forest management practices to encourage good stewardship practices.

The public use of Crown lands for recreation, accessibility, hunting and fishing, to name a few, illustrates the wide variety of values held by the general public. Tourism plays an important role in the regional economy; as a result, unique challenges in meeting the needs of all stakeholders must be assessed and managed appropriately. The NSDNRR has implemented an integrated resource management (IRM) land use approach for the management of Crown lands.

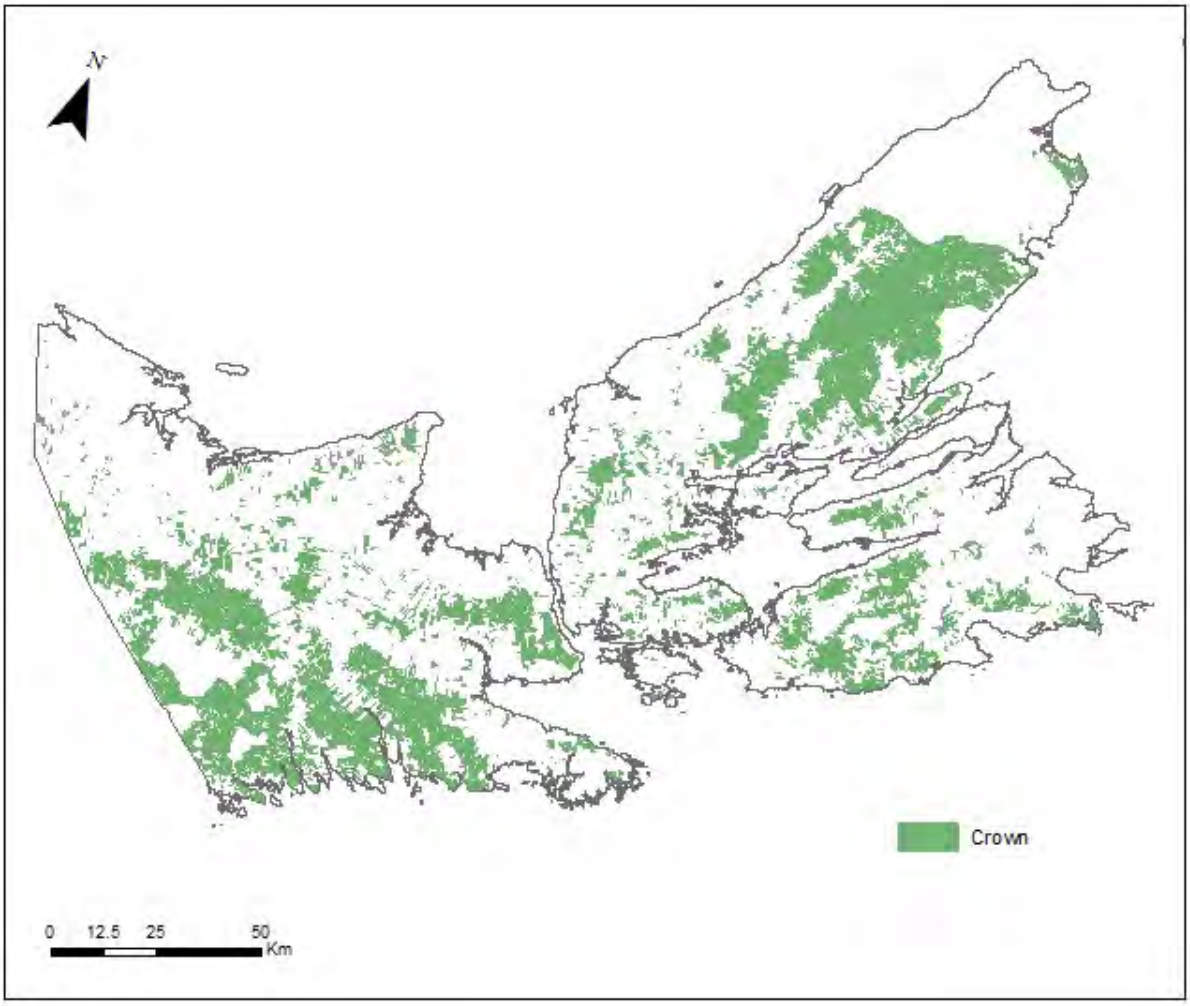

Figure 1-1 PHP's Crown License Area under the Forest Utilization License Agreement

2.0 FOREST CERTIFICATION AND HIGH CONSERVATION VALUE FORESTS

Forest management certification is one of many tools used for ensuring the sustainability of PHP's operations. Certification is a voluntary process by which planning, procedures, systems and performance of on-the-ground forestry operations are audited by a qualified and independent third party against a predetermined standard. Forest operations found to be in conformance with the given standard are issued a certificate and follow-up surveillance audits are conducted annually to ensure continued compliance and improvement. Chain of Custody certification provides a rigorous process for tracking certified forest and manufactured material through the paper-making process so appropriate claims can be made by PHP and its customers.

The Woodlands Department of PHP is certified to various management standards including Forest Stewardship Council® (FSC) National Forest Management Standard, Sustainable Forestry Initiative® (SFI) Forest Management Standard, FSC Chain of Custody Standard, SFI Chain of Custody Standard, and the Programme for Endorsement of Forest Certifications™ (PEFC) Chain of Custody Standard. Third-party audits are conducted annually to verify that PHP continues to manage the forest resource that meets all certification requirements.

An important element in the FSC certification process is the analysis of a company's forest lands for potential high conservation value forests (HCV). All forests contain some ecological or social value(s) that are important for biological processes or human needs. Examples of forest values are rare species habitat, recreational sites, or old growth forests. A forest can be defined as a HCV if the values within are considered to be of outstanding significance or critical importance (ProForest Toolkit 1, 2003).

The HCV framework was first developed for certification by FSC in 1999 and has been applied on an international scale. Since it is international in scope, the HCV framework is generic in its definition, which requires a regional or national interpretation for the forest being assessed. Currently, Principle 9 of the FSC National Standard states that:

> *The Organization shall maintain and/or enhance the High Conservation Values in the Management Unit through applying the precautionary approach.*

The FSC National Standard identifies six categories for the assessment of potential high conservation value forests. The six categories are:

HCV 1: Species diversity. Concentrations of biological diversity including endemic species, and rare, threatened or endangered species that are significant at global, national or regional levels.

HCV 2: Landscape-level ecosystems and mosaics. Intact Forest Landscapes and large landscape-level ecosystems and ecosystem mosaics that are significant at global, national or regional levels, and that contain viable populations of the great majority of the naturally occurring species in natural patterns of distribution and abundance.

HCV 3: Ecosystems and habitats. Rare, threatened, or endangered ecosystems, habitats or refugia.

HCV 4: Critical ecosystem services. Basic ecosystem services in critical situations, including protection of water catchments and control of erosion of vulnerable soils and slopes.

HCV 5: Community needs. Sites and resources fundamental to satisfying the necessities of local communities or Indigenous Peoples (for livelihood, health, nutrition, water, etc.), identified through engagement with these communities or Indigenous Peoples.

HCV 6: Cultural values. Sites, resources, habitats and landscapes of global or national cultural, archaeological or historical significance, and/or of critical cultural, ecological, economic or religious/sacred importance for the traditional cultures of local communities or Indigenous Peoples, identified through engagement with these local communities or Indigenous Peoples.

Using the best scientific information available and local knowledge and expertise, HCV's are spatially identified for the forest area. Afterwards, appropriate management decisions and monitoring is required to ensure that key values are maintained or enhanced over time. Typically, the HCV assessment is completed by a working group or consultant, which is followed up by an external peer review process. Guidance material for completing the HCV assessment is available through a variety of sources including the FSC National Standard, the ProForest HCV Toolkit, and World Wildlife Canada's HCV Support Document.

For the original HCV methodology when first assessed in 2007-08, refer to Appendix A.

3.0 PURPOSE AND SCOPE OF 2023-2028 HCV ASSESSMENT

This update to the HCV assessment was completed to verify and/or update the original identified HCV's for the 2023-2028 certification period to ensure current values and/or new values are relevant, captured, and managed for using new information, data, or reports. This update included an internal review of the 19 questions that form Annex D of the FSC Canada National Standard. Each HCV identified in the previous assessment was verified for continued accuracy or modified based on new information.

The original consultation completed for the first assessment is still applicable to this 2023-2028 HCV assessment report, since much of the original contributions and decisions are retained. Sections where changes and consultations were made for the 2023-2028 certification period are summarized in Appendix B.

4.0 SUMMARY OF 2023-2028 HIGH CONSERVATION VALUE FORESTS

The assessment of high conservation values on PHP lands was conducted using the HCV Assessment Framework provided in Annex D of the FSC Canada National Standard. Additional guidance was also originally drawn upon from the FSC Boreal Standard (FSC Canada 2007a), ProForest HCV Toolkits (Jennings et al. 2003a, 2003b; Jennings 2004), and World Wildlife Fund Canada's HCV Support Document (WWF Canada, 2005). Each HCV category has a question or series of questions that aid in determining whether the assessed lands contain high conservation values. The following sections are structured by HCV category and associated questions. New HCV additions for the 2023-2028 certification period are highlighted in green.

Table 1: Summary of 2023-2028 HCV's pink highlights are new additions

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Collective Overlap of High Conservation Values **Question 19: Significant Overlap of Values**	None identified

4.1 HCVF Assessment Table – Status, Threats and Management

In a HCVF assessment, identifying the status, threats and management guidelines to a High Conservation Value is a critical component. This step helps to understand how well the value is being maintained and what factors may impact it now or in the future.

* SMP – Special Management Practices

Species / Value	Description (HCV Type)	Current Status & Population Trend (if applicable)	Forest Management Threats	Severity	Management Notes
American Marten	Small carnivore dependent on mature conifer/mixed forests (HCV 1)	Endangered (NS) Presumed stable, Recovery Plan for the American Marten in NS, 2023	Habitat fragmentation, loss of old-growth, road access	High	Implement NSDNR SMP Guidelines
Mainland Moose	Dependent on young and mature mixed forests, and wetlands	Endangered (NS, Mainland population) Declining, Action Plan for the Recovery of Eastern Moose in Mainland NS, 2014-2018	Habitat loss, over-hunting, parasitic brainworm, roads	High	Implement NSDNR SMP Guidelines
Canada Lynx	Boreal predator reliant on dense softwood/snowshoe hare (HCV 1)	Endangered (NS) Declining, Status Report on the Canada Lynx in NS, 2001	Softwood loss, trails, bobcat competition	High	Implement NSDNR SMP Guidelines
Wood Turtle	Semi-aquatic turtle in riparian forest/rivers (HCV 1)	Threatened (Canada) Endangered (NS) Declining, Recovery Plan for the Wood Turtle in NS, 2020-2025	Buffer disturbance, sedimentation, nest loss	High	Maintain ≥30m riparian buffers; protect nesting zones
Bicknell's Thrush	High elevation fir-nesting songbird (HCV 1)	Threatened (Canada) Endangered (NS) Declining, Recovery Strategy for the Bicknell's Thrush in NS, 2020-2025	Loss of habitat, pre-commercial thinning	Medium–High	Implement NSDNR SMP Guidelines
Rusty Blackbird	Wetland breeder in swamps/bogs (HCV 1)	Special Concern (Canada) Endangered (NS) Declining, Nova Scotia Species at Risk Website Species at risk - Government of Nova Scotia, Canada	Wetland drainage, riparian harvest	Medium	Buffer wetlands, retain snags; avoid activities during breeding season
Roseate Tern	Coastal island-nesting seabird (HCV 1)	Endangered (Canada & NS) Declining, Amended Recovery Strategy for the Roseate Tern in NS, 2021-2026	Human colony disturbance (not forestry)	Low	Avoid colonies
Olive-sided Flycatcher	Nests in open conifer forest/burns (HCV 1)	Threatened (Canada & NS) Declining, Recovery Plan for the Olive-sided Flycatcher in NS, 2021-2026	Snag removal, salvage logging	High	Retain snags; avoid activities during breeding season
Eastern Whip-poor-will	Ground-nester in open forests (HCV 1)	Threatened (Canada & NS)	Nesting-season harvest, edge predators	High	Retain open forest;

Species / Value	Description (HCV Type)	Current Status & Population Trend (if applicable)	Forest Management Threats	Severity	Management Notes
		Declining, Recovery Plan for the Eastern-whip-poor-will in NS, 2021-2026			ADD SUMMARY
Eastern Wood Pewee	Mature deciduous forest mid-canopy (HCV 1)	Special Concern ((Canada) Vulnerable (NS) Declining, Management Plan for the Eastern Wood-pewee in NS, 2022	Canopy opening, mid-age forest loss	Medium	Retain forest patches; avoid activities during breeding season
Canada Warbler	Moist mixed forest understory nester (HCV 1)	Threatened (Canada) Endangered (NS) Declining, Recovery Plan for the Canada Warbler in NS, 2021-2026	Understory removal, conversion of swamp forests to agriculture	High	Buffer moist forest; avoid activities during breeding season
Chimney Swift	Roosts in chimneys, snags (HCV 1)	Threatened (Canada) Endangered (NS) Declining, Recovery Plan for the Chimney Swift in NS, 2023-2028	Loss of large snags and roost sites	Medium	Retain snags; protect known roosts; avoid activities during breeding season
Common Nighthawk	Nests in open forests, gravel areas (HCV 1)	Threatened (Canada & US) Declining, Recovery Plan for the Common Nighthawk in NS, 2021-2026	Harvest during breeding, nest trampling	Medium	Avoid activities during breeding season
Wood Thrush	Interior mature hardwood forests (HCV 1)	Threatened (Canada) Declining, COSEWIC Assessment and Status Report, 2012	Forest fragmentation, edge effects	Medium	Maintain interior forest blocks
Evening Grosbeak	Mixed/conifer forest seed feeder (HCV 1)	Special Concern (Canada) Vulnerable (NS) Declining, NS government website Species at risk - Government of Nova Scotia, Canada	Loss of food sources; pesticide exposure	Medium	Retain mast trees (spruce/fir); avoid pesticides; avoid activities during breeding season
Black-foam Lichen	Grows on old hardwoods in humid forests (HCV 1)	Threatened (Canada & US) Declining, Recovery Plan for the Black Foam Lichen in NS, 2024-2029	Logging of host trees; light/humidity loss	High	Conduct survey & buffer known trees
Little Brown Bat	Roosts in trees/buildings/snags (HCV 1)	Endangered (Canada & NS) Declining, Recovery Plan for Little Brown Myotis in NS, 2020-2025	Roost removal; disturbance during maternity	High	1-km noise reduction buffer around caves
Tri-coloured Bat	Roosts in riparian foliage/bark (HCV 1)	Endangered (Canada & NS) Declining, Recovery Plan for Tri-coloured Bat in NS, 2020-2025	Tree removal; White-nose Syndrome (WNS)	High	1-km noise reduction buffer around caves
Northern Bat	Roosts in snags/cavities (HCV 1)	Endangered (Canada & NS) Declining, Recovery Plan for Northern Bat in NS, 2020-2025	Roost loss; WNS; forest disturbance	High	1-km noise reduction buffer around caves

Species / Value	Description (HCV Type)	Current Status & Population Trend (if applicable)	Forest Management Threats	Severity	Management Notes
New Jersey Rush	Wetland-edge plant (HCV 1)	Special Concern (Canada) Vulnerable (NS) Presumed Stable, NS Government Website Species at risk - Government of Nova Scotia, Canada	Wetland drainage, equipment damage	High	Buffer known sites; protected under provincial Atlantic Coastal Plain Flora
Boreal Felt Lichen	Epiphytic lichen in foggy fir forests (HCV 1)	Endangered (Canada & US) Presumed Declining, Recovery Plan for Boreal Felt Lichen in NS, 2020-2025	Balsam fir harvest, humidity loss	Very High	500-meter SMP/no harvest buffer around known sites
Vole Ears Lichen	Similar to Boreal Felt; very sensitive (HCV 1)	Endangered federally Presumed Declining, Recovery Plan for Vole Ears Lichen in NS, 2020-2025	Microclimate alteration	Very High	Buffer habitat; retain canopy cover
Blue Felt Lichen	On old deciduous trees (coastal) (HCV 1)	Endangered (Canada & NS) Presumed Declining, NS Government Website Species at risk - Government of Nova Scotia, Canada	Hardwood harvest, edge exposure	High	Conduct survey & buffer known trees
Eastern White Cedar	Limestone/calcareous swamp species (HCV 1)	Vulnerable (NS) Stable in protected/inaccessible areas. Presumed declining status elsewhere in NS. Management Plan for Native Occurrences of Eastern White Cedar in NS, 2010	Road building, forest harvest near wetlands	Medium	Retain in wetlands; buffer known sites
Black Ash	Riparian tree, Indigenous cultural value (HCV 1)	Threatened (Canada & NS) Unknown, Recovery and Action Plan for Black Ash in NS, 2015	Forest harvest near wetlands; Emerald Ash Borer	High	Protect cultural use around known sites
Frosted Glass Whiskers	Minute lichen on hardwood bark (HCV 1)	Special Concern (Canada) Unknown, Frosted glass-whiskers COSEWIC Assessment and Status Report 2005	Forest harvest, humidity loss	Medium	Conduct survey & buffer known trees
Wrinkled Shingle Lichen	Moist hardwood/mixed forest lichen (HCV 1)	Threatened (Canada & US) Presumed Declining, NS Government Website Species at risk - Government of Nova Scotia, Canada	Humidity/light balance disrupted	High	Conduct survey & buffer known trees
Atlantic Coastal Plain Flora	Plant species found in coastal regions of NS	Legally at-risk and sensitive plant species. Declining to stable populations. Recovery Strategy and Management Plan for Multiple	Habitat loss and degradation, and changes in ecological	Low	Protected under NS government ACPF GIS layer

Species / Value	Description (HCV Type)	Current Status & Population Trend (if applicable)	Forest Management Threats	Severity	Management Notes
		Species of Atlantic Coastal Plain Flora in Canada, 2010.	dynamics or natural processes		
PHP Watersheds	High proportion of watershed area managed by PHP. Includes 17 watersheds.	Monitored SFM indicator considered stable. Maintaining non-clearcut status has been stable for several years.	Over-harvest using clearcut method resulting in effects to water quality	Moderate-low	Continued monitoring of SFM indicator for PHP watersheds. Extensive management under Triad management expected to further improve watershed health.
Cold-water streams for Salmon and Trout	Important rivers that support Salmon and Trout populations.	Monitored SFM indicator considered stable. Cold-water streams buffers established for special management where applicable. Monitoring results show compliance to HCV management objectives.	Over-fishing, habitat degradation, acid precipitation, pollution, and invasive species competition	Moderate	Monitor implementation of stand structure reserve using GIS overlay of completed harvest treatments with cold-water areas.
International Bird Areas	Important stopover locations for numerous species of migratory birds.	HCV considered stable due to most sites being on rocky coastal islands or headlands.	Habitat loss, agriculture, pollution, tourism	Low	IBA's in PHP's operating area are not impacted by forest management activities due to their location.
Red Spruce	Defining long-lived species in the Acadian forest.	HCV considered stable across Nova Scotia with less natural presence in Cape Breton.	Over-harvesting and poor forest management practices.	Low	Red spruce stands are managed using appropriate treatments methods based on pre-treatment assessment and operational planning.
Protected Areas	Ecologically significant areas legally protected from management activities.	HCV considered increasing. Goals to achieve protected areas established by Nova Scotia government. Currently on target.	Forest management not permitted in protected areas.	Low	Monitoring of forest management activities to ensure no infringement in protected areas.
Special Management Zone adjacent to Protected Areas	Minimize road construction to reduce access points into protected areas.	HCV considered stable. New roads are not being built into the SMZ. NSDNRR has also implemented a 100-m buffer around protected areas for applying SMP's and/or additional protection measures as needed.	Road development, public access with ATV's	Low	If roads are needed, build parallel to protected area boundary to minimize access points.
Intact Forest Landscapes	Forest and non-forest ecosystems minimally impacted by human activity	HCV is stable. There is one IFL in Nova Scotia. It is approximately 104,000 hectares and encompasses the Cape Breton Highlands National Park as well as other	Forest harvesting, fragmentation, habitat loss, ecological degradation	Low	PHP manages a very small portion of the IFL. In the past eight years, PHP has managed 20 hectares.

Species / Value	Description (HCV Type)	Current Status & Population Trend (if applicable)	Forest Management Threats	Severity	Management Notes
	with an area of at least 50,000 hectares.	forest areas outside the park. PHP manages approximately 4,000 hectares.			
Large Landscape Level Forests	Large intact forest areas greater than 10,000 hectares.	HCV is stable. PHP has identified 16 large landscape level forests. These are monitored annually for core roadless areas and special management practices. Condition of areas have remained intact for last 10 years.	Forest harvesting, fragmentation, habitat loss, ecological degradation	Low	PHP has had minimal impact on areas due to no or little harvesting and road building.
Significant Ecosites	Rare, threatened or endangered ecosystems.	HCV considered stable. Identified areas are protected from management activities.	Forest harvesting, habitat loss, ecological degradation	Low	Significant ecosites are forest areas not managed by PHP unless the mapped ecosystem does not match on-the-ground characteristics.
Old Forest	Old forest protected areas.	HCV considered increasing. Identified old forest areas are protected from management. Pre-treatment assessments have increased the number of old growth stands identified and protected.	Forest management not permitted in old forest areas.	Low	Monitoring of forest management activities to ensure no infringement in old growth protected areas.
PHP Protected Areas	Administrative protected areas of poorly represented ecosystems.	HCV considered stable. Forest management is not permitted in PHP protected areas.	Forest management not permitted in PHP protected areas.	Low	Monitoring of forest management activities to ensure no infringement in protected PHP areas.
Connectivity Management Zones	Maintain continuous canopy cover between intact forest areas.	HCV considered stable. CMZ's continue to maintain 100 meter wide continuous canopy cover and CMZ's are not severed across their width.	Forest harvesting, fragmentation	Moderate-Low	Monitoring of forest management activities to ensure special management is implemented in CMZs..
Margaree & St. Mary's River Watershed	Maintain a high level of non-clearcut condition in St. Mary's and Margaree watersheds.	HCV considered stable. High level of compliance with non-clearcut condition in watersheds.	Forest harvesting using clearcut method	Moderate-Low	Monitoring of forest management activities to maintain high level of non-clearcut condition. Extensive management in watersheds will not permit clearcut treatments.

Species / Value	Description (HCV Type)	Current Status & Population Trend (if applicable)	Forest Management Threats	Severity	Management Notes
Legally Protected Municipal Water Supply Areas	Maintain water health for communities.	HCV considered stable. Forest management is not occurring in areas unless requested by municipality.	Forest harvesting, water/soil degradation	Low	Areas only managed if requested by municipality. Historically no management by PHP in designated municipal supply areas.
Water Supply Intake Areas	Maintain water health for communities.	HCV considered stable. Watercourse protection measures are in place.	Forest harvesting, water/soil degradation	Low	Implement measures such as riparian buffers, steep slope management, rutting and ground disturbance guidelines.
Steep Slopes	Maintain soil health and community health.	HCV considered stable. No regular harvesting occurs in steep slope areas.	Water/soil degradation, landslides	Low	No regular harvesting occurs in steep slope areas.
Cattle Grazing on Cape Breton Highlands	Support needs of local communities.	HCV considered stable. No issues arising from HCV.	Interactions between forest workers and cattle	Low	PHP does not restrict access to Crown land for cattle grazing.
Viewshed Areas	Minimize visual impacts to local communities from harvest activities.	HCV considered stable. No issues have arising from HCV.	Visual impacts from forest management	Moderate-Low	Implement Viewsheds procedure for low, medium, and high visibility areas.
First Nations Forest Values and Uses	Minimize impacts to First Nations forest values and uses.	HCV considered stable. No issues have been raised by First Nations regarding PHP operations. NSDNRR scan of Mi'kmaq values also conducted on operations plans which may result in special management measures or protection.	Loss of significant values and uses due to forest management	High	Review annual operating plan with Mi'kmaq organizations. Implement measures to protect identified values and uses.
Traditional Cultural Identity	Minimize impacts to First Nations traditional cultural identity.	HCV considered stable. No issues have been raised by First Nations regarding PHP operations. NSDNRR scan of Mi'kmaq values also conducted on operations plans which may result in special management measures or protection.	Loss of significant values and uses due to forest management	High	Implement FPIC process to ensure First Nations cultural identity, values and uses are properly identified and managed in collaboration with First Nations.

5.0 CATEGORY 1: BIODIVERSITY

Category 1: Species diversity. Concentrations of biological diversity including endemic species, and rare, threatened, or endangered species that are significant at global, national or regional levels.

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?

All national- and provincial-listed species-at-risk were originally analyzed by the HCV Design Committee to determine if these species are likely to occur within the area of operation. Species lists were obtained from COSEWIC for nationally-listed species and from NSDNRR for provincially-listed species. For the 2015-2020 re-assessment period, nationally and provincially listed species were reviewed to identify changes to existing species status or newly listed species at risk.

If a national- or provincial-listed species-at-risk was determined to likely occur within the area of operation, based on existing data and knowledge, further analysis was undertaken to assess known spatial distributions and habitat requirements. Spatial data comes from NSDNRR and NSE as well as from existing records from the Atlantic Canada Conservation Data Centre (ACCDC). Where required, individual status reports and recovery plans were also reviewed for select species.

Results

Tables 2 and 3 show a complete list of nationally- and provincially-listed species-at-risk in Nova Scotia as of September 2023. Many of these species were identified during the original assessment and any new additions or changes are noted accordingly. Based on these tables, Table 4 lists all species at risk known or presumed to occur on the company's forest management area. HCV designation is noted in this table.

Table 2: Nationally-listed species-at-risk in Nova Scotia (COSEWIC Website Species search - Species at risk registry (canada.ca))

Common Name	COSEWIC Status (2023)	Taxonomic Group
American Eel	Threatened	Fishes (freshwater)
Atlantic Mud-piddock	Threatened	Molluscs
Atlantic Salmon	Endangered	Fishes (marine)
Atlantic Salmon	Special Concern	Fishes (marine)
Atlantic Salmon	Endangered	Fishes (marine)
Atlantic Salmon	Endangered	Fishes (marine)
Atlantic Sturgeon	Threatened	Fishes (freshwater)
Atlantic Whitefish	Endangered	Fishes (freshwater)
Bank Swallow	Threatened	Birds
Barn Swallow	Special Concern	Birds
Barrow's Goldeneye	Special Concern	Birds
Bicknell's Thrush	Threatened	Birds
Black Ash	Threatened	Vascular Plants
Black-foam Lichen	Threatened	Lichens
Blanding's Turtle	Endangered	Reptiles
Blue Felt Lichen	Special Concern	Lichens
Bobolink	Special Concern	Birds
Boreal Felt Lichen	Endangered	Lichens
Brook Floater	Special Concern	Molluscs
Canada Warbler	Special Concern	Birds
Chimney Swift	Threatened	Birds
Common Nighthawk	Special Concern	Birds
Eastern Baccharis	Threatened	Vascular Plants
Eastern Lilaeopsis	Special Concern	Vascular Plants
Eastern Meadowlark	Threatened	Birds
Eastern Mountain Avens	Endangered	Vascular Plants
Eastern Painted Turtle	Special Concern	Reptiles
Eastern Red Bat	Endangered	Mammals (terrestrial)
Eastern Ribbonsnake	Threatened	Reptiles
Eastern Waterfan	Threatened	Lichens
Eastern Whip-poor-will	Special Concern	Birds
Eastern Wood-pewee	Special Concern	Birds
Eskimo Curlew	Endangered	Birds
Evening Grosbeak	Special Concern	Birds
Frosted Glass-whiskers	Special Concern	Lichens
Goldencrest	Special Concern	Vascular Plants
Gypsy Cuckoo Bumble Bee	Endangered	Arthropods
Harbour Porpoise	Special Concern	Mammals (marine)
Harlequin Duck	Special Concern	Birds

Hoary Bat	Endangered	Mammals (terrestrial)
Horned Grebe	Endangered	Birds
Horned Grebe	Special Concern	Birds
Hudsonian Godwit	Threatened	Birds
Leach's Storm-Petrel	Threatened	Birds
Least Bittern	Threatened	Birds
Leatherback Sea Turtle	Endangered	Reptiles
Lesser Yellowlegs	Threatened	Birds
Little Brown Myotis	Endangered	Mammals (terrestrial)
Long's Bulrush	Special Concern	Vascular Plants
Lumpfish	Threatened	Fishes (marine)
Macropis Cuckoo Bee	Endangered	Arthropods
Maleberry	Endangered	Vascular Plants
Monarch	Endangered	Arthropods
New Jersey Rush	Special Concern	Vascular Plants
Northern Myotis	Endangered	Mammals (terrestrial)
Olive-sided Flycatcher	Special Concern	Birds
Pink Coreopsis	Endangered	Vascular Plants
Piping Plover melodus subspecies	Endangered	Birds
Plymouth Gentian	Endangered	Vascular Plants
Prototype Quillwort	Special Concern	Vascular Plants
Red Knot rufa subspecies	Endangered	Birds
Red Knot rufa subspecies	Special Concern	Birds
Red Knot rufa subspecies	Endangered	Birds
Red-necked Phalarope	Special Concern	Birds
Redroot	Special Concern	Vascular Plants
Roseate Tern	Endangered	Birds
Rusty Blackbird	Special Concern	Birds
Sable Island Sweat Bee	Threatened	Arthropods
Savannah Sparrow princeps subspecies	Special Concern	Birds
Scaly Fringe Lichen	Threatened	Lichens
Short-eared Owl	Threatened	Birds
Shortfin Mako	Endangered	Fishes (marine)
Shortnose Sturgeon	Special Concern	Fishes (freshwater)
Silver-haired Bat	Endangered	Mammals (terrestrial)
Skillet Clubtail	Special Concern	Arthropods
Smooth Skate	Special Concern	Fishes (marine)
Snapping Turtle	Special Concern	Reptiles
Striped Bass	Endangered	Fishes (freshwater)
Striped Bass	Special Concern	Fishes (freshwater)
Suckley's Cuckoo Bumble Bee	Threatened	Arthropods
Sweet Pepperbush	Threatened	Vascular Plants
Tall Beakrush	Endangered	Vascular Plants
Thorny Skate	Special Concern	Fishes (marine)

Thread-leaved Sundew	Endangered	Vascular Plants
Transverse Lady Beetle	Special Concern	Arthropods
Tri-colored Bat	Endangered	Mammals (terrestrial)
Tubercled Spike-rush	Special Concern	Vascular Plants
Vole Ears Lichen	Endangered	Lichens
Water Pennywort	Special Concern	Vascular Plants
White Shark	Endangered	Fishes (marine)
White-rimmed Shingle Lichen	Threatened	Lichens
Wood Thrush	Threatened	Birds
Wood Turtle	Threatened	Reptiles
Wrinkled Shingle Lichen	Threatened	Lichens
Yellow Lampmussel	Special Concern	Molluscs
Yellow-banded Bumble Bee	Special Concern	Arthropods

Table 3: Provincially-listed species-at-risk in Nova Scotia (NSDNRR Website Species at risk - Government of Nova Scotia, Canada)

Common Name	Nova Scotia Status (2023)	Taxonomic Group
American Marten	Endangered	Mammals
Atlantic Whitefish	Endangered	Fishes (freshwater)
Bank Swallow	Endangered	Birds
Barn Swallow	Endangered	Birds
Bicknell's Thrush	Endangered	Birds
Black Ash	Threatened	Vascular Plants
Black Foam Lichen	Threatened	Lichens
Blanding's Turtle	Endangered	Reptiles
Blue Felt Lichen	Vulnerable	Lichens
Bobolink	Vulnerable	Birds
Boreal Felt Lichen	Endangered	Lichens
Brook Floater	Threatened	Molluscs
Canada Lynx	Endangered	Mammals
Canada Warbler	Endangered	Birds
Chimney Swift	Endangered	Birds
Common Nighthawk	Threatened	Birds
Eastern Baccharis	Threatened	Vascular Plants
Eastern Lilaeopsis	Vulnerable	Vascular Plants
Eastern Mountain Avens	Endangered	Vascular Plants
Eastern Ribbonsnake	Threatened	Reptiles
Eastern Waterfan	Threatened	Lichens
Eastern Whip-poor-will	Threatened	Birds
Eastern White Cedar	Vulnerable	Vascular Plants
Eastern Wood-Pewee	Vulnerable	Birds

Evening Grosbeak	Vulnerable	Birds
Golden-crest	Vulnerable	Vascular Plants
Gypsy Cuckoo Bumble Bee	Endangered	Arthropods
Harlequin Duck	Endangered	Birds
Hoary Willow	Endangered	Vascular Plants
Little Brown Myotis	Endangered	Mammals
Long's Bulrush	Vulnerable	Vascular Plants
Macropis Cuckoo Bee	Endangered	Arthropods
Monarch	Endangered	Arthropods
Moose (Mainland Population)	Endangered	Mammals
New Jersey Rush	Vulnerable	Vascular Plants
Northern Myotis	Endangered	Mammals
Olive-sided Flycatcher	Threatened	Birds
Peregrine Falcon	Vulnerable	Birds
Pink Coreopsis	Endangered	Vascular Plants
Piping Plover	Endangered	Birds
Plymouth Gentian	Endangered	Vascular Plants
Prototype Quillwort	Vulnerable	Vascular Plants
Ram's-Head Lady Slipper	Endangered	Vascular Plants
Red Knot	Endangered	Birds
Redroot	Vulnerable	Vascular Plants
Rockrose (Canada Frostweed)	Endangered	Vascular Plants
Roseate Tern	Endangered	Birds
Rusty Blackbird	Endangered	Birds
Sable Island Sweat Bee	Threatened	Arthropods
Snapping Turtle	Vulnerable	Reptiles
Spotted Pondweed	Vulnerable	Vascular Plants
Sweet Pepperbush	Vulnerable	Vascular Plants
Tall beakrush	Endangered	Vascular Plants
Thread-leaved Sundew	Endangered	Vascular Plants
Transverse Lady Beetle	Endangered	Arthropods
Tri-colored Bat	Endangered	Mammals
Tubercled Spikerush	Vulnerable	Vascular Plants
Vole Ears	Endangered	Lichens
Water Pennywort	Endangered	Vascular Plants
Wood Turtle	Threatened	Reptiles
Wrinkled Shingle Lichen	Threatened	Lichens
Yellow Lampmussel	Threatened	Molluscs
Yellow-banded Bumble Bee	Vulnerable	Arthropods

Currently in Nova Scotia there are 64 listed Species at Risk. The number of forest-dwelling species that may be impacted by PHP's forest management is 27 (Table 4).

Table 4: Known or presumed to occur within PHP's forest management area

Species	Habitat	Nature Serve Status	Potentially Affected by PHP Management
Boreal felt lichen	Forest	G1G2	YES
Roseate tern	Coastal forest/islands	G4	YES
Bicknell's thrush	Forest	G4	YES
Wood turtle	Forest/aquatic	G3	YES
Rusty blackbird	Scrub riparian habitats	G4	YES
New Jersey Rush	Edges of bogs/fens	G2G3	YES
Chimney Swift	Forest/Rural/Urban	G5	YES
Common Nighthawk	Waterways/Forest/ Open Areas	G5	YES
Frosted glass-whiskers	Forest	GNR	YES
Olive-sided Flycatcher	Open Forest	S4S5	YES
Eastern Whip-poor-will	Open Forest	N/A	YES
Eastern Wood Peewee	Forest	N/A	YES
Canada Warbler	Forest	S5	YES
Vole Ears	Forest	G4G5	YES
Blue Felt Lichen	Forest	GNR	YES
Mainland Moose	Forest	G5TNR	YES
Canada lynx	Forest	N/A	YES
American marten	Forest	N/A	YES
Eastern white cedar	Forest	N/A	YES
Black Ash	Forest	N/A	YES
Black-foam Lichen	Forest	G3G5	YES
Little Brown Myotis	Caves/Forest	G3	YES
Northern Myotis	Caves/Forest	G1G2	YES

Tri-colored Bat	Caves/Forest	G2G3	YES
Wood Thrush	Forest	G4	YES
Evening Grosbeak	Forest	G5	YES
Wrinkled Shingle Lichen	Forest	G3/G5	YES

Nature Serve Status Descriptions for Global (G), National (N) and State/Provincial (S) Levels:
1 = critically imperiled
2 = imperiled
3 = vulnerable
4 = apparently secure
5 = secure

TNR – unranked/not yet assigned
GNR – Global rank not yet assessed

HCV Mammals

American Marten

Status:

National – Not Listed

Provincial – Endangered

Description

The American marten was once widespread throughout Nova Scotia, but is now located in only two small areas of the Cape Breton Highlands and only in very small numbers. Current population estimates suggest that the population could be as low as 15 to 30 individuals. Preferred habitat for American marten in Nova Scotia is old-growth forest, particularly mature conifer and mixed coniferous-deciduous stands (Scott 2001).

The cause of the on-going decline of the American marten is primarily the result of loss of optimal habitat. Forestry salvage operations in the Cape Breton Highlands in the late-eighties, following a spruce-budworm infestation, were particularly damaging to the remnant American marten populations in this area. Other threats posed by the forestry sector include habitat fragmentation, road construction (*particularly logging roads pushed into remote area*s), and increased human access to existing American marten areas (*potentially opening-up new areas to trapping lines*) (NSAMRT 2006). Because the current American marten population is so low, the species is also vulnerable to geographic isolation, inbreeding suppression, trapping by-catch, increased predation, and stochastic factors (NSAMRT 2006). Historically, trapping for marten has also caused significant population declines for the species.

Distribution

The American marten has been extirpated from mainland Nova Scotia and is now located in only two areas in the Cape Breton Highlands; (1) Northwest Cape Breton Highlands National Park, and (2) Southeast highlands of Victoria County (*Ingonish River Valley south to Middle River*) (Scott 2001, NSAMRT 2006). The current area of occurrence is around 300km^2, which represents only a tiny fraction of its former range**. Efforts are currently underway to re-establish an American marten population in mainland Nova Scotia at Kejimkujik National Park and in the Cape Breton Highlands.**

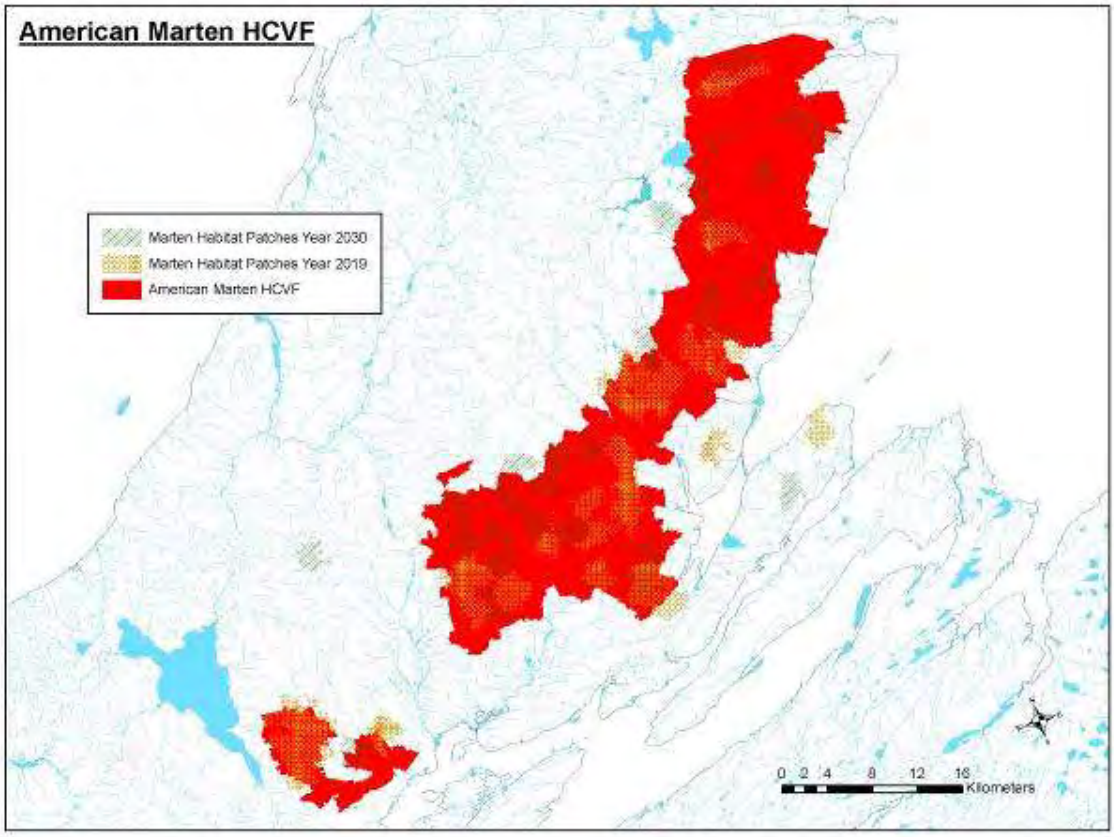
HCV Decision

The American marten recovery strategy for Cape Breton Island has identified a Marten Habitat Management Zone (MHMZ) derived from modelling, local experience, and the inclusion of some previously existing moratoria areas. All lands managed by PHP within the MHMZ are considered to be an HCV. These areas include large portions of known American marten habitat in the southeast

highlands area of Victoria County, from Ingonish River Valley to Middle River, and also further south in the vicinity of Humes River.

Management Approach

In Nova Scotia, the provincial policy for American Marten Special Management Practices (**Microsoft Word - American Marten Special Management Practices.docx (novascotia.ca)**) are implemented in areas identified by the provincial government.



Mainland Moose

Status:

National – Not Listed

Provincial – Endangered

Description

The mainland moose population of Nova Scotia has declined to around 1000 to 1200 individuals, with an effective breeding population potentially much lower than this. Within the past 30 years, total mainland moose numbers have declined in Nova Scotia by 20% (NSDNRR 2007b).

The cause of the mainland moose decline is not well understood, but is likely due to a combination of factors, including habitat loss, over-harvesting, poaching, parasitic brainworm, increased road access and road density, spread of white-tailed deer, deficiencies in certain nutrients (*particularly cobalt*), high levels of cadmium, and possibly unknown viral diseases (Parker 2003, Beazley et al. 2004, NSDNRR 2007b).

Moose on Cape Breton Island were introduced from Alberta in the 1940's. They are not part of the remnant Nova Scotia population and are not endangered (Parker 2003).

Distribution

Endangered moose occur throughout mainland Nova Scotia, but are concentrated in a few key areas of the province (Parker 2003). Two of these core areas occur within PHP's area of operation; (1) Pictou Hills, and (2) Antigonish Highlands/Guysborough. Spatial delineations of critical moose areas have been identified and mapped by the Nova Scotia Department of Natural Resources and Renewables and Renewables.

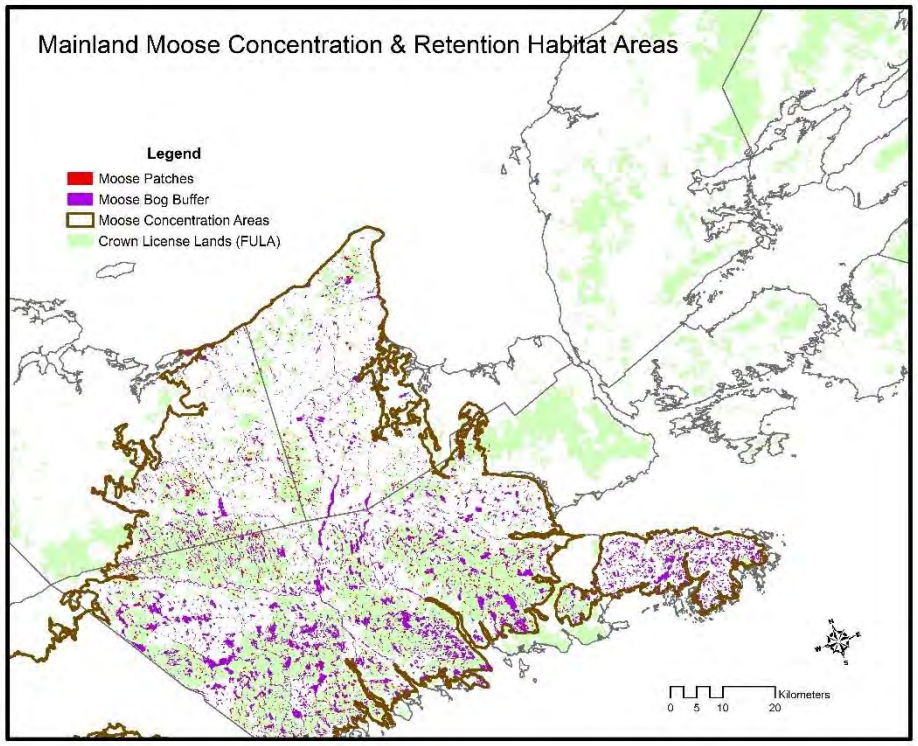
HCV Decision

The mainland moose concentration and retention habitat areas identified by the Nova Scotia Department of Natural Resources and Renewables and Renewables are considered HCV's.

The Cape Breton moose population is not a listed species and therefore, not considered HCV.

Management Approach

In Nova Scotia, the provincial policy for Mainland Moose Special Management Practices (**Microsoft Word - Mainland Moose Special Management Practices.doc (novascotia.ca)**) are implemented in areas identified by the provincial government.


Mainland Moose Concentration & Retention Habitat Areas
Legend
Moose Patches
Moose Bog Buffer
Moose Concentration Areas
Crown License Lands (FULA)
0 5 10 20
Kilometers

Canada Lynx

Status:

National – Not Listed

Provincial – Endangered

Description

The Canada lynx was listed as an endangered species in 2001 and it currently occupies only 40-50% of its historic breeding range in Nova Scotia. Its population fluctuates on a ~10-year cycle in association with cyclic changes to the snowshoe hare population, its principle source of prey. Recent estimates place the population between 95 and 140 individuals at the low end of the 10-year population cycle and between 475 and 525 individuals at the high end of the cycle. The effective breeding population in Nova Scotia may represent only 20% of this population (Parker 2001).

Threats to the Canada lynx in Nova Scotia come mostly from inter-specific competition from bobcats and coyotes, loss of habitat from forestry operations, reduced population viability through population isolation and limited genetic diversity, human exploitation (*often as accidental by-catch in traps*), and climate change.

Distribution

Canada lynx has been extirpated from mainland Nova Scotia, where historical breeding ranges include the Cobequid Mountains, Pictou/Antigonish Hills, and Musquodoboit Hills, and possibly the southwest interior and North Mountain.

The extent of the current breeding range is located entirely on Cape Breton Island, particularly in the Highlands region. Smaller populations occur on the eastern shores of the Bras d'Or Lakes at Boisdale Hills and East Bay Hills. The total current breeding range is estimated to be ~4,800 km^2 (Parker 2001). Spatial distributions are shown in the NSDNRR status report for Canada lynx.

HCV Decision

All treed bogs (*with a 100m buffer*) within the Canada lynx areas of the Cape Breton Highlands, Boisdale Hills, and East Bay Hills (NSLRT, 2006) are considered HCVs. This is consistent with the Canada lynx recovery strategy for Nova Scotia, which stipulates that all treed bogs within these Canada lynx areas have a 100 m no harvest buffer zone (*except where some limited harvesting promotes cone-bearing spruce habitat within the buffer zone*).

Management Approach

In Nova Scotia, the provincial policy for Canada Lynx Special Management Practices (**Microsoft Word - Canada Lynx Special Management Practices 2012.doc (novascotia.ca)**) are implemented in areas identified by the provincial government.

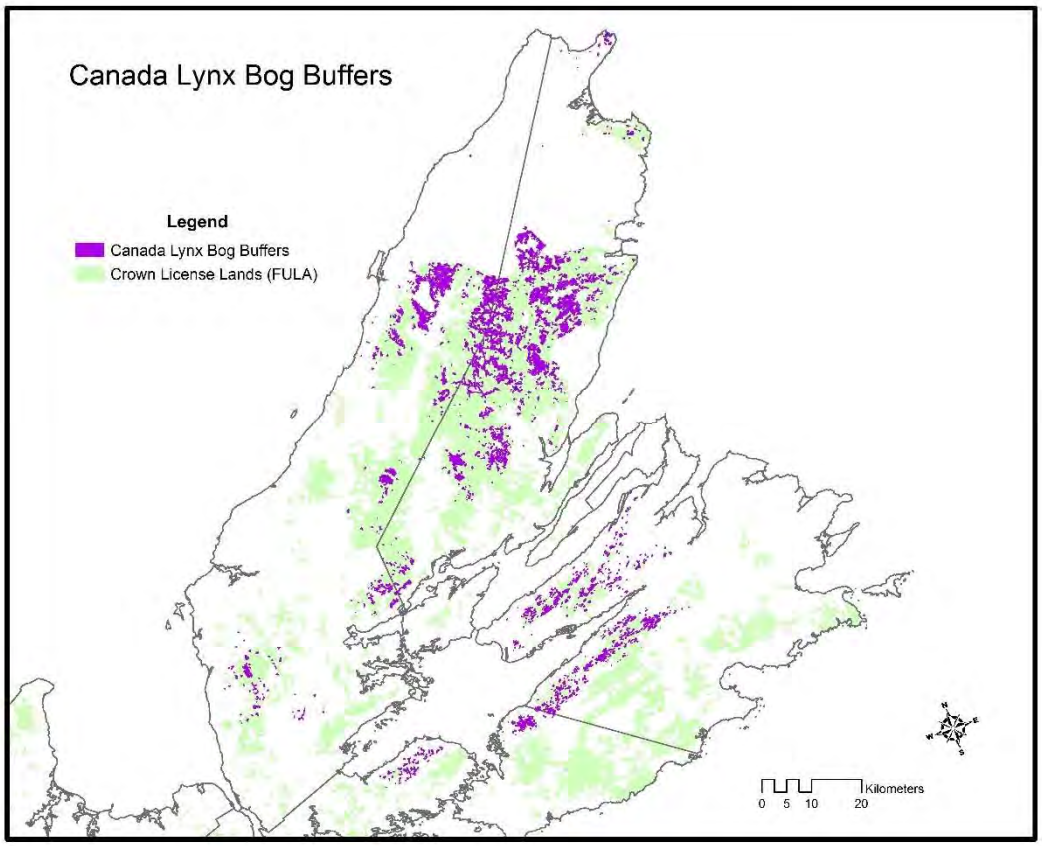


Figure 1. Images of the three bat species; clockwise, from top left; *Myotis lucifugus* (dead bat with visual signs of WNS on muzzle ears and wings; Berryton Cave, NB); *M. septentrionalis* (with visual signs of WNS on forearm; Lake Charlotte, NS); *Perimyotis subflavus* (Hayes Cave, NS). Note the elongated ears and pointed tragus typical of *M. septentrionalis*. (Photo credits: *M. lucifugus*: K. Vanderwolf; *M. septentrionalis* and *P. subflavus*: H. Broders.)

Little Brown Bat, Tri-colored Bat, and Northern Bat

Status:

National – Endangered

Provincial – Endangered

Description

The proposed COSEWIC Recovery Strategy (2016) describes all three bats as "small (average 7.4 g), brown-pelaged, insectivorous species. The Little Brown Myotis is the most common bat species in Canada and often roost in buildings, barns and attics and feed over lakes and other highly visible areas (Hugh Broders, pers. comm). The Northern Myotis is most common in a forested habitat, while the Tri-colored Bat uses a variety of habitat types and is rarer than the Little Brown and Northern bats.

The single biggest threat to the three bat species is white-nose syndrome (WNS). WNS is a fungal disease and was first detected in Canada in 2010. It's estimated that WNS has caused a decline of 94% in bat populations throughout Nova Scotia, New Brunswick, Ontario, and Quebec. WNS continues to expand throughout the area, which is expected to affect the entire bat population into the next decade (COSEWIC, 2013). The rapid decline of populations due to WNS led to an emergency listing of the three bat species as endangered under the federal and provincial Species at Risk Acts.

All bats have three main types of habitat requirements: overwintering for hibernating, summering for roosting and foraging, and swarming for mating and socializing. All three bat species overwinters in underground openings, including caves, abandoned mines, wells, and tunnels, and typically are used year after year (COSEWIC, 2016). The Little Brown Myotis may also overwinter in buildings, barns, and attics (Hugh Broders, pers. comm) and are known to use bat boxes. Urban and suburban areas with trees and/or forested habitat, bat boxes, bridges, cliffs, and barns are known to be used in the summer for roosting by the Little Brown Myotis. They tend to prefer older forest stands where there is a higher abundance of snags for roosting and foraging habitat in the closed understory.

The Northern Myotis rarely uses man-made structures for roosting and are more reliant on tree species than the other two bat species. Height, diameter, age, and decay class are all important variables in preferred trees species for the Northern Myotis (COSEWIC, 2013). Large diameter snag trees found in open areas of mature to overmature forests are important for the Northern Myotis. A coniferous or conifer-dominated mixedwood stand seems to be the preferred forest type for all three

bat species. Feeding by the Northern Myotis often occurs in the low-lying areas within a forest (Hugh Broders, pers. comm).

The Tri-colored Bat roosting habits are less understood than the other two bat species. Most sites are found in forested areas where they seem to roost in dead foliage and lichens. Of the three bat species in Nova Scotia, the Tri-colored Bat seems to be the least common in PHP's forest management area, where 98% of known sightings have occurred west of Truro (Hugh Broders, pers. comm).

Swarming habitat for all three species is most often used in late summer and early fall. These areas are used mainly for socialization such as mating, migration stops, and assessment of possible overwintering sites near openings of hibernacula. (COSEWIC, 2016).

Distribution

The population range of the three bat species vary from each other**, however, t**he distribution of **WNS** is approximately the same. The range of all three species shows that they occupy areas in eastern Nova Scotia. However, approximately 98% of the tri-colored bat population is predominantly found in central and western Nova Scotia (west of Truro) (Hugh Broders, pers. comm).

HCV Decision

All three bat species are considered an HCV.

Management Approach

Currently in Nova Scotia, there are no best forest management practices required for bats (Hugh Broders, pers. comm). With the recent (2016) release of the proposed federal Recovery Strategy for all three bat species, a comprehensive list of actions has been identified to work towards bat population recovery on an international and national scale. One action item includes the development of beneficial management practices by Environment Canada for the forestry, wind energy, mining and nuisance wildlife control industries. PHP will stay abreast of the development of these practices, so they may be incorporated into everyday management.

It is assumed there are abandoned or unused buildings on PHP's Crown lease from old camp sites that could be used by bats. However, PHP does not have a comprehensive list of their locations since they are granted by the provincial government. Regardless, if an abandoned building is discovered during a forest operation, it is left alone. There are known bat caves on PHP's Crown lease, however, PHP does not know of the exact location. Planned forest management activities near bat caves are reviewed by NSNDRR and restrictions are implemented as required by the Department.

Regarding wolf trees which are important for roosting, the NS Forest Wildlife Guidelines of 1988, which is now a Crown land policy, recommends that snags, wolf trees, and cavity trees be left on harvest sites as much as possible. Most often, wolf trees are so large and difficult to harvest because of many branches, and have low economic value, that PHP leaves on site. PHP also audits all Crown contractors quarterly and one item checked for is unmerchantable trees retained on site, which would be snags, wolf trees, and cavity trees. Since 2009, unmerchantable trees were retained on site 100% on all audits except for 97% in 2010.

Until beneficial management practices do become available, PHP is currently managing the forest in a variety of ways that benefit bat habitat needs. A 2006 report called "Forest Management & Bats" by Bat Conservation International lists a variety of forest management activities that can support bat habitat needs. Below is a table summarizing these activities and how PHP's management supports bat conservation.

PHP Management	Treatment Type	Practices Currently Implemented Beneficial to Bats
Even-aged Management Complete or almost complete removal of all trees in a forest stand, which are replaced by a new stand of young trees.	Clearcut Shelterwood Seedtree	- Edge habitat for foraging - Herbaceous growth following harvest can provide food sources for insects - Snag trees left standing can provide roosting sites - Wildlife clumps of standing trees provide some structure - Mature structure left on site following shelterwood and seedtree provide foraging and roosting habitat
Uneven-aged Management Individual and/or small patches of trees are harvested which create small canopy openings. A variety of trees sizes and ages remain abundant in stand.	Group Selection Single-tree Selection	- Abundance of mature trees left on site provides roosting habitat - Small gap openings provide foraging habitat - Edge habitat for foraging - Snag trees left standing can provide mature roosting sites
Thinning Removal of weak or supressed trees to promote healthy growth in remaining stand.	Pre-commercial Thinning Commercial Thinning	- Increased light to the forest floor can increase herbaceous growth for bats' insect prey.
Wildlife Corridors, Leave Strips, Connectivity Management Zones	All areas as required	- Edge habitat for foraging - Travel corridors - Roosting sites

Varying widths of unmanaged stands between managed areas		
Riparian Habitat Management Buffers of forest stands along all watercourses (bed and shore of a river, stream, lake, creek, pond, marsh, estuary or salt-water body that contains water for at least part of each year)	All watercourses greater than 50 cm wide	- A minimum 20 meters riparian buffer is maintained along all watercourses greater than 50 cm. - As % slope increases from the watercourse edge, the riparian buffer must be increased to a maximum of 60 meters - Although permitted, PHP generally does not harvest inside riparian buffers - Riparian habitat provides important high quality foraging habitat for bats

HCV Birds

Roseate Tern

Status:

National – Endangered

Provincial – Endangered

Description

The roseate tern reaches its northern range in eastern Canada. It nests in association with other seabirds, particularly common terns, on coastal islands and exposed coastal areas.

Population numbers are very low for this species, having declined significantly over the past 50 years (NSDNRR 2007a). An estimated 150 breeding pairs of roseate terns are believed to occur in Canada, the majority of which occur in Nova Scotia.

Threats to the roseate tern include predation on eggs and young (*particularly by gulls, crows, and minks*), human disturbance to colonies, and encroachment by coastal development (Whittam and Leonard 1999, NSDNRR 2007a). Inter-specific competition for breeding space and the effects of certain toxic chemicals may also be having an effect on this species. Direct human exploitation of roseate terns for egg- and feather-collecting has caused substantial declines for this species in the past.

Distribution

The roseate tern is distributed on both sides of the Atlantic Ocean and winters on the north-eastern coast of South America from Brazil to Guyana. It reaches its northern range in Canada, where it breeds primarily along the Atlantic coast of Nova Scotia. Over 90% of the Canadian population is concentrated in three colonies in Nova Scotia: (1) Brothers Islands, (2) Grassy Island, and (3) Country Island complex.

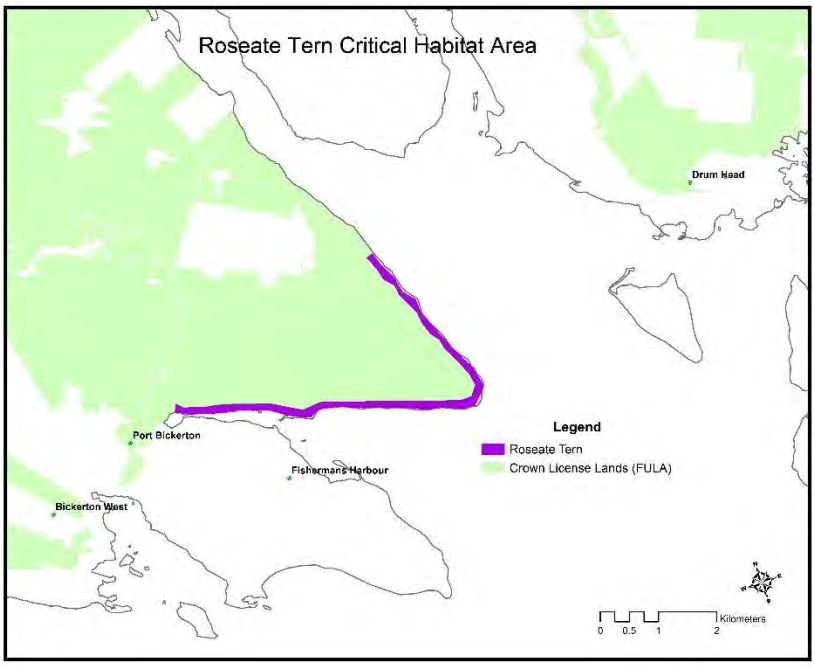
The Country Island complex occurs in Guysborough County, just off the coast from Goldboro at the head of Country Harbour. PHP's area of operation includes lands on the adjacent mainland coast, in close proximity to the Country Island complex. Mainland areas in this vicinity are used extensively by roseate terns for feeding and, in the past, as temporary refuge sites when predators have invaded the colony on the island complex.

HCV Decision

Roseate term habitat at Fishermans Harbour is considered an HCV.

Management Approach

A 150 m no harvest buffer zone along the coast at Fishermen's Harbour has been established.



Roseate Tern IBA site at Country Harbour (IBA Canada, 2007)

Bicknell's Thrush

Status:

National – Threatened

Provincial – Endangered

Description

The Bicknell's thrush is an elusive songbird that inhabits dense coniferous forest and stands of regenerating balsam fir at high elevations and along the coast. It breeds in eastern Canada and the northeastern United States. Bicknell's thrush is considered globally-vulnerable by the International Union for the Conservation of Nature (IUCN).

Threats to the Bicknell's thrush come mostly from loss of habitat, particularly encroachment from development and disturbance associated with large-scale forestry practices, especially pre-commercial thinning.

Distribution

In Nova Scotia, the Bicknell's thrush is found mostly on Cape Breton Island, with the greatest concentrations occurring in the Highlands (*e.g. Cape Breton Highlands National Park, Cape North, highlands south of Cheticamp Lake*) and Scaterie Island (IBA Canada 2007). These areas contain globally-significant concentrations of Bicknell's thrush. The Kelly's Mountain area in Cape Breton was also previously identified by the Important Bird Areas (IBA) program (of Bird Studies Canada and Nature Canada) as Bicknell's thrush habitat. However, Bird Studies Canada has recently acknowledged that this IBA site was mapped incorrectly and should instead represent known Bicknell's thrush habitat south of the Cape Breton Highlands National Park where PHP has considerable lands under management. The BITH federal recovery strategy released in 2020 identified critical habitat in the Highlands with areas of suitable habitat and areas with the potential to become suitable habitat based on possible, probable or confirmed breeding record data obtained between June 1 and August 15, from 1995 to 2014.

HCV Decision

All existing Bicknell's thrush IBA sites and critical habitat areas are considered HCVs. Within PHP's area of operation, these currently include Cape North and Scaterie Island.

Additional sites within the Cape Breton Highlands, particularly sites found south of the National Park, are also known to contain Bicknell's thrush, in part, through research efforts carried out by Bird Studies Canada and the Canadian Wildlife Service.

Management Approach

Following ECCC guidance, the Department of Lands and Forestry is adopting the following position effective April 16, 2021 and updated May 3, 2021:

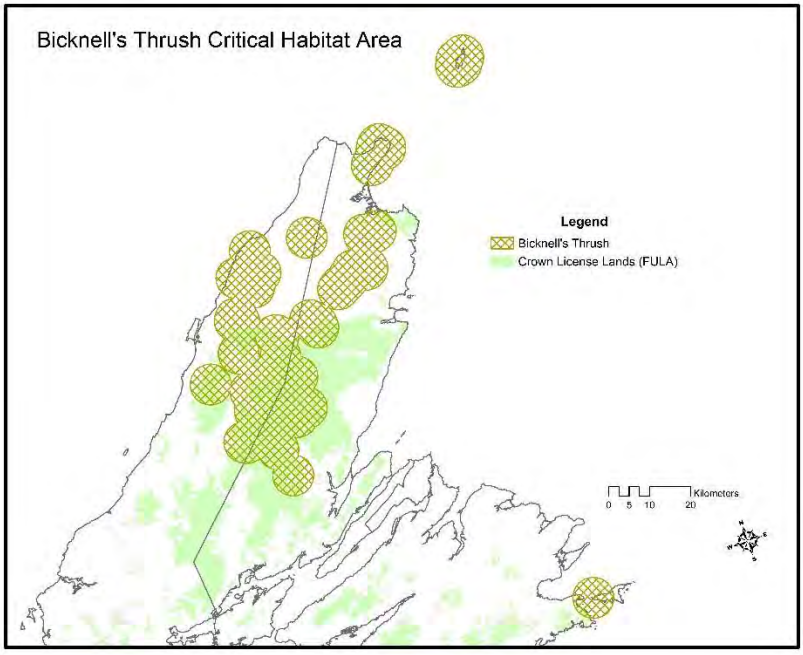
1. Pre-Commercial Thinning in BITH Critical Habitat, including any silviculture plans included within current or previous Annual Operating Plans, is not approved on Crown lands.

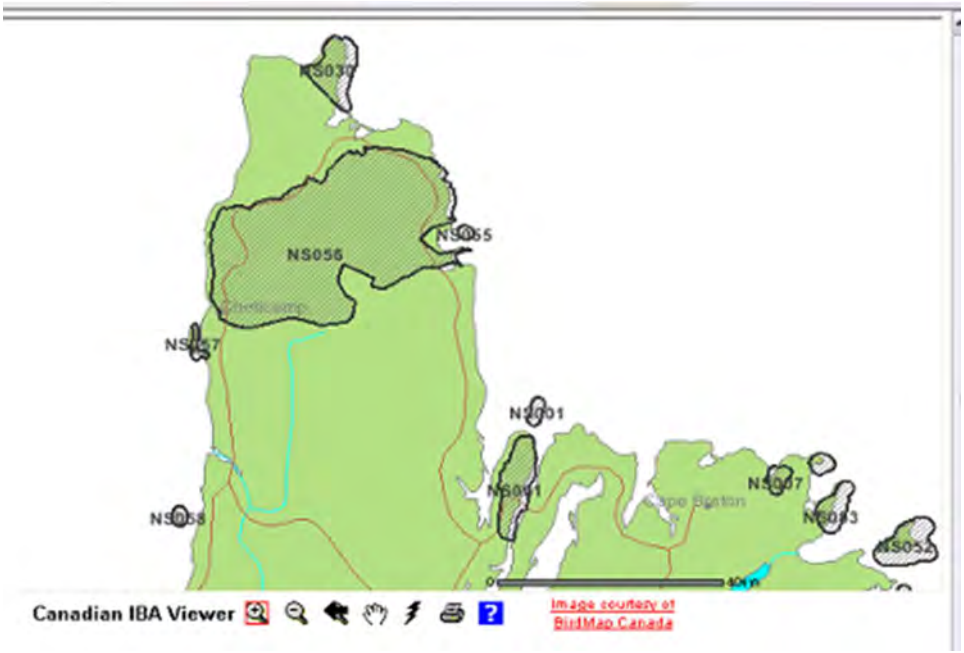
2. Commercial (Mature tree) harvesting within BITH Critical Habitat on Crown lands, including any harvest plans included within current or previous Annual Operating Plans, may be approved, so long as there is no net loss of suitable habitat within the Critical Habitat polygons over time (as defined above). The timeline for implementation of approved harvest plans may be subject to change as further details on "No Net Loss" become available (i. e. maximum annual allowable harvest will need to be managed).

    - Harvest directly adjoining young high density stands (as per attached shape file) is likely to disturb breeding BITH. PHP shall submit plans demonstrating how this disturbance will be minimized or avoided between June 1 and July 31. Harvest plans may be implemented during this period pending receipt from the licensee of an approved plan for avoidance and minimization of disturbance.

3. Maintenance of existing roads (grading, ditching, culverts, bridges, brushing) within BITH Critical Habitat (including any roads plans within current or previous Annual Operating Plans) is likely to disturb breeding BITH. PHP shall submit plans demonstrating how this disturbance will be minimized or avoided between June 1 and July 31. Roads maintenance plans may be implemented during this period pending receipt from the licensee of an approved plan for avoidance and minimization of disturbance.

4. Construction of new roads within BITH Critical Habitat is not permitted until further notice.





Bicknell's Thrush IBA sites (IBA Canada, 2007)

Rusty Blackbird

Status:

National – Special Concern

Provincial – Endangered

Description

The rusty blackbird is a medium-sized **songbird** that breeds in swampy wooded areas of the boreal forest zone. Its population has been steadily declining over most of the past century and this trend shows no signs of levelling-off (Greenberg and Droege 1999). Causes of the steep decline are not entirely understood, though habitat loss and wetland conversion are a known threat, particularly in the over-wintering ranges of the species further south. Blackbird control programs in the United States may also be causing problems for the species.

Distribution

The breeding range of the rusty blackbird occurs throughout the boreal and northern temperate forest zone, from Newfoundland through to Alaska, including all of Nova Scotia. The over-wintering range includes the mixed and deciduous forests of central and eastern North America.

In eastern Canada, the Rusty Blackbird uses scrub riparian habitats of islands, lakes, rivers and streams as well as alder and willow thickets (COSEWIC, 2006). On PHP's Crown license area, there are 69 locations in ACCDC's sensitive species dataset dated May 2022. These locations range in observation dates from 1987 to 2018 (see below map).

HCV Decision

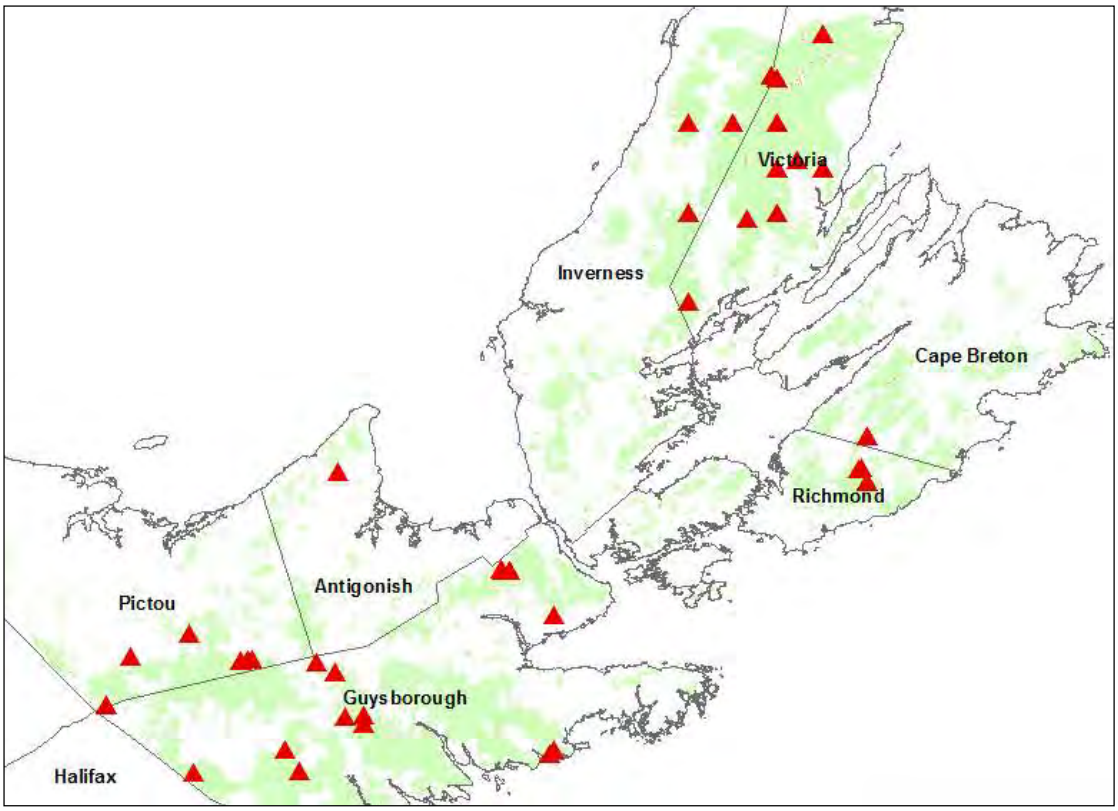
Rusty blackbird habitat is considered a HCV. They tend to occupy forests near the edges of wetlands, bogs, rivers and streams where PHP currently establishes 20 m riparian buffers. Additionally, PHP establishes 100 m buffers around all treed bogs in Cape Breton for Canada lynx habitat management.

Management Approach

PHP implements the Wildlife Habitat and Watercourse Protection Regulations, which is deemed sufficient for Rusty Blackbirds since they tend to occupy forests near the edges of wetlands, bogs, rivers and streams.

PHP also establishes no harvest buffers (100+ meters wide) around all treed bogs in Cape Breton and specific bogs for Mainland Moose. These are presumed to be beneficial for Rusty Blackbird habitat since buffers larger than 75-100m around wetlands and forested wetlands are suitable or occupied by Rusty Blackbirds.

Deferral of management activities in these locations during the breeding season of May to August may occur depending on data quality, year of original sighting, and input from regional NSDNRR biologists. Deferral of management activities have occurred related to at-risk bird known locations.


Victoria
Inverness
Cape Breton
Richmond
Antigonish
Pictou
Guysborough
Halifax

Olive-sided Flycatcher

Status:

National – Threatened

Provincial – Threatened

Description

The Olive-sided Flycatcher is a **small to medium sized passerine bird in the family Tyrannidae**. It is a migratory species that travels from South to North America to breed during the summer. The bird is a very agile flyer and mainly consumes flying insects on flight. Olive-sided Flycatchers eat many wasps and bees. They have large territories and are very aggressive when it comes to nest defense. The bird prefers forest edges, forest openings, or open woodlands.

Olive-sided flycatcher are found in early post-fire landscapes or clearings, and like to perch on the tops of tall trees or snags, from which they take off to catch flying insects. They have a preference for coniferous forest edges, and openings like meadows, rivers, bogs, swamps, and ponds, including young forests following a forest fire or clearcut.

Distribution

Olive-sided flycatcher is found throughout Nova Scotia. It winters in Central and South America.

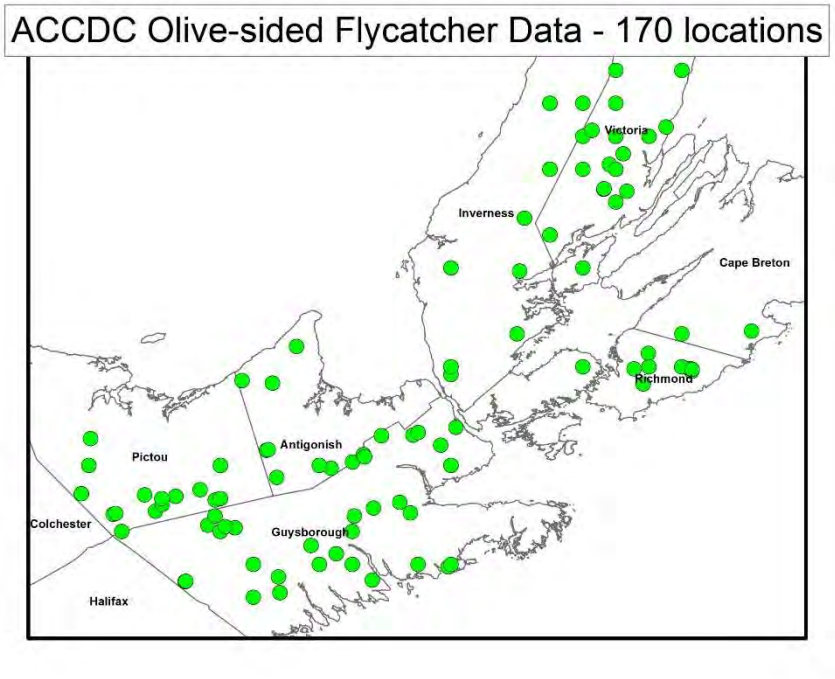
HCV Decision

Olive-sided Flycatcher is considered an HCV.

Management Approach

NSDNRR is currently renewing the provincial species at risk recovery programs by developing new recovery teams for listed species. As of April 2019, a new recovery team was established for all listed birds in the province. These teams will "set the goals and objectives to address data gaps or threats, monitor the success of recovery and provide recovery-related advice to government to resolve management questions" (www.novascotia.ca/news).

Until specific Special Management Practices are identified by the provincial government, there are temporal exclusions during the breeding season (typically mid-April to end of August) when species occurrence data is within the vicinity of a planned forest management operation.



Source Data: Atlantic Canada Conservation Data Centre

Chimney Swift

Status:

National – Threatened

Provincial – Endangered

Description

A bird best identified by silhouette, the smudge-gray Chimney Swift nimbly maneuvers over rooftops, fields, and rivers to catch insects. Its tiny body, curving wings, and stiff, shallow wingbeats give it a flight style as distinctive as its fluid, chattering call. This enigmatic little bird spends almost its entire life airborne. When it lands, it can't perch—it clings to vertical walls inside chimneys or in hollow trees or caves. This species has suffered sharp declines as chimneys fall into disuse across the continent.

Historically, the bird used large hallow trees for nesting sites and will concentrate in places where insects are abundant such as lakes and wetlands.

Distribution

The Chimney Swift occurs throughout Nova Scotia. It winters in South America.

HCV Decision

Chimney Swift is considered an HCV.

Management Approach

NSDNRR is currently renewing the provincial species at risk recovery programs by developing new recovery teams for listed species. As of April 2019, a new recovery team was established for all listed birds in the province. These teams will "set the goals and objectives to address data gaps or threats, monitor the success of recovery and provide recovery-related advice to government to resolve management questions" (www.novascotia.ca/news).

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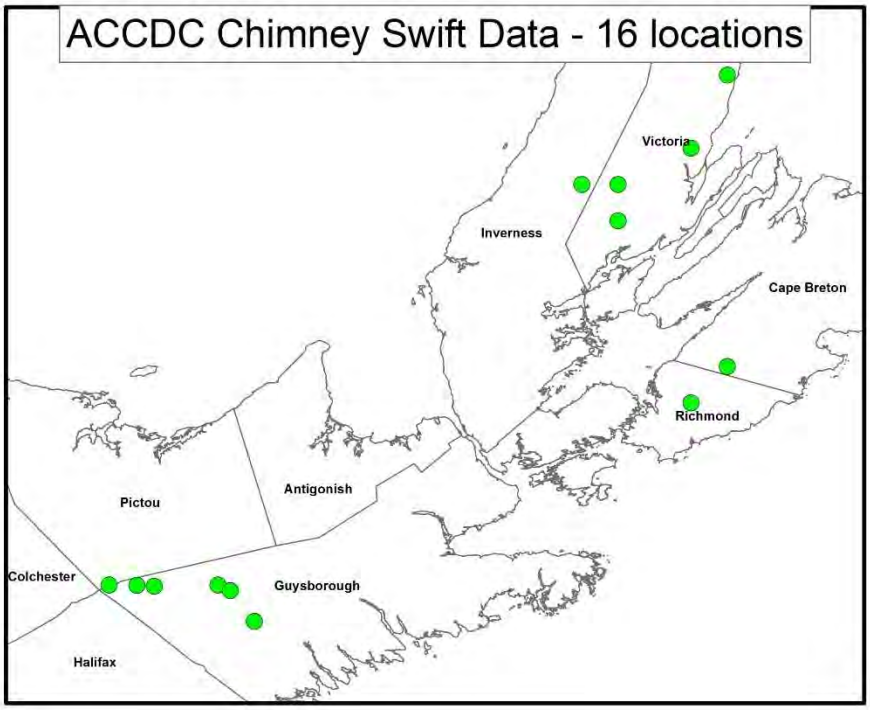

Source Data: Atlantic Canada Conservation Data Centre

Common Nighthawk

Status:

National – Threatened

Provincial – Threatened

Description

On warm summer evenings, Common Nighthawks roam the skies over treetops, grasslands, and cities. Their sharp, electric *peent* call is often the first clue they're overhead. In the dim half-light, these long-winged birds fly in graceful loops, flashing white patches out past the bend of each wing as they chase insects. These fairly common but declining birds make no nest. Their young are so well camouflaged that they're hard to find, and even the adults seem to vanish as soon as they land.

Their breeding habitat includes open areas with little ground vegetation, such as sand dunes, beaches, logged or burned-over areas, forest clearings, rock barrens, peat bogs, and pastures.

Distribution

The Common Nighthawk occurs throughout Nova Scotia. It winters in South America.

HCV Decision

Common Nighthawk is considered an HCV.

Management Approach

NSDNRR is currently renewing the provincial species at risk recovery programs by developing new recovery teams for listed species. As of April 2019, a new recovery team was established for all listed birds in the province. These teams will "set the goals and objectives to address data gaps or threats, monitor the success of recovery and provide recovery-related advice to government to resolve management questions" (www.novascotia.ca/news).

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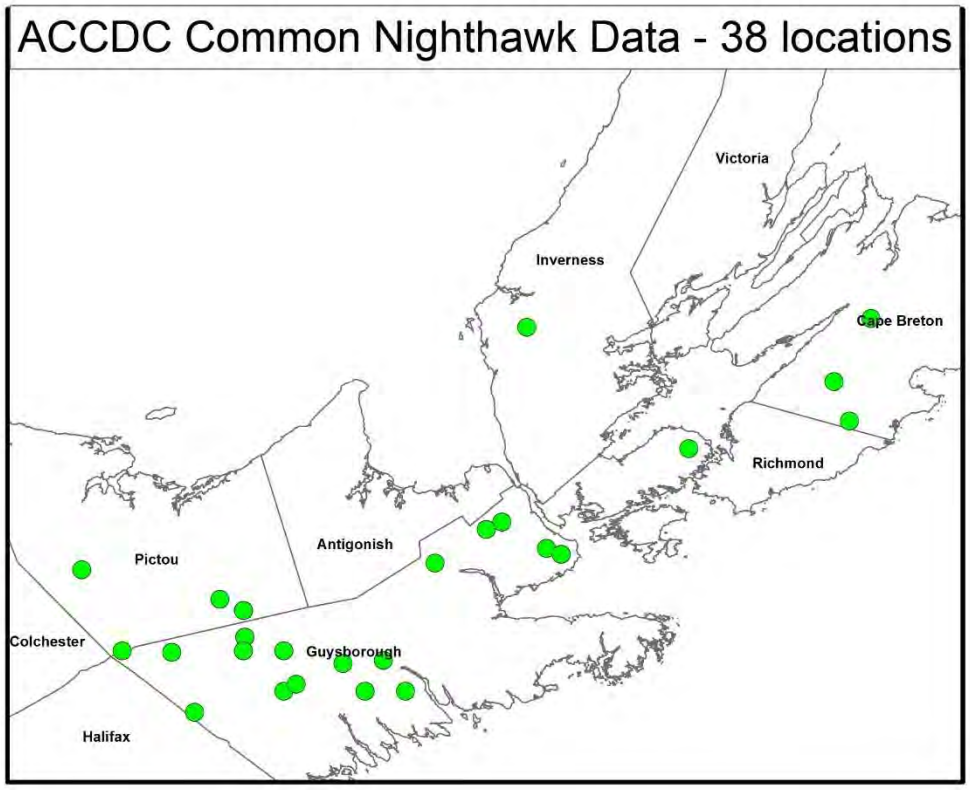

Source Data: Atlantic Canada Conservation Data Centre

Eastern Wood-pewee

Status:

National – Special Concern

Provincial – Vulnerable

Description

Eastern Wood-Pewees are medium-sized flycatchers with long wings and tails. Like other pewee species, they have short legs, upright posture, and a peaked crown that tends to give the head a triangular shape. Their long wings are an important clue to separate them from *Empidonax* flycatcher species.

They are typically found along mature deciduous and mixedwood forest edges (with sugar maple, oak, and poplar) and natural forest clearings. They require open areas to feed and big trees with branches to perch on. Generally, they avoid habitats near roads, development, and areas cleared by forestry activities. Nests are often built on the limbs of tall, mature trees.

Distribution

The Eastern Wood-pewee occurs throughout Nova Scotia. It winters in South America.

HCV Decision

Eastern Wood-pewee is considered an HCV.

Management Approach

NSDNRR is currently renewing the provincial species at risk recovery programs by developing new recovery teams for listed species. As of April 2019, a new recovery team was established for all listed birds in the province. These teams will "set the goals and objectives to address data gaps or threats, monitor the success of recovery and provide recovery-related advice to government to resolve management questions" (www.novascotia.ca/news).

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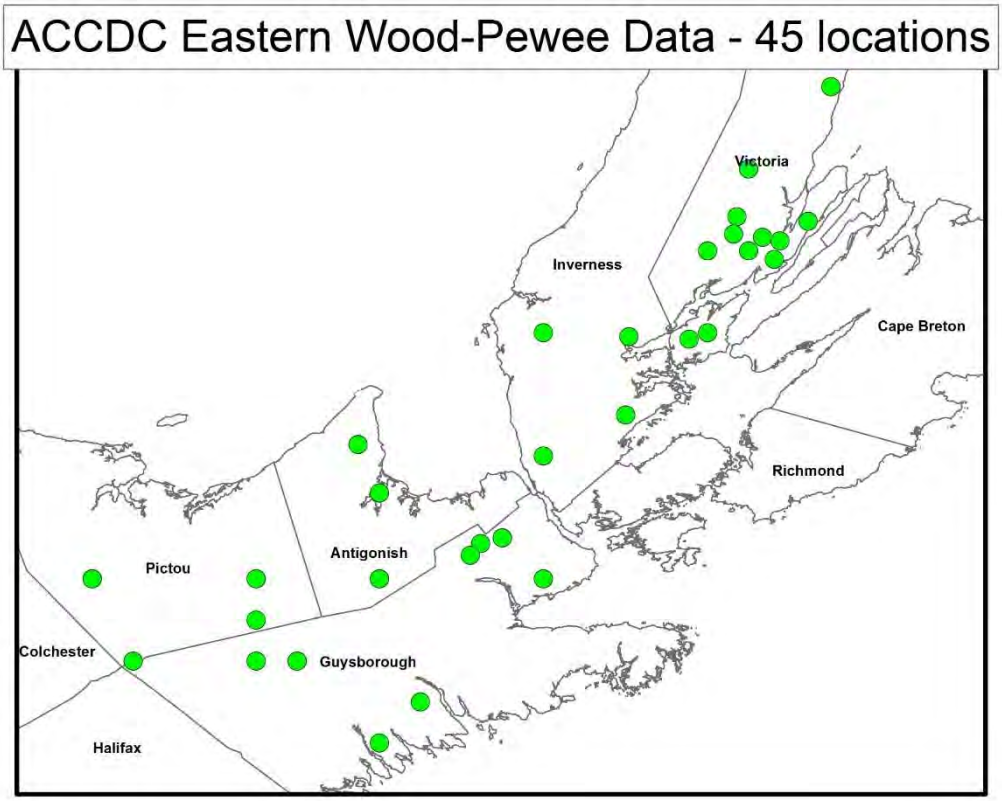

Source Data: Atlantic Canada Conservation Data Centre

Canada Warbler

Status:

National – Threatened

Provincial – Endangered

Description

Canada warblers are so little studied partly because they have never been abundant. They are limited to a fairly specific niche, inhabiting dense, log-strewn understoreys in damp, mossy woods, usually near forest edges, swamps and bogs and often in ravines or on steep slopes leading to waterside thickets of alders and willows. Their nests, well hidden in moss hummocks, rotting stumps and ruts created by upended trees, are seldom found, obscured by thick fern beds and tree roots. The Canada Warbler is also found in stands regenerating after natural disturbances, such as forest fires, or anthropogenic disturbances, such as logging.

The factors responsible for the decline of the Canada Warbler have not been identified. However, habitat loss and degradation in the wintering range of this migratory bird are thought to be the most likely factors. In eastern Canada, habitat loss due to the conversion of swamp forests to agricultural activities is believed to have contributed to the decline in Canada Warbler populations.

Distribution

The Canada Warbler occurs throughout Nova Scotia. It winters in Venezuela.

HCV Decision

Canada Warbler is considered an HCV.

Management Approach

NSDNRR is currently renewing the provincial species at risk recovery programs by developing new recovery teams for listed species. As of April 2019, a new recovery team was established for all listed birds in the province. These teams will “set the goals and objectives to address data gaps or threats, monitor the success of recovery and provide recovery-related advice to government to resolve management questions” (www.novascotia.ca/news).

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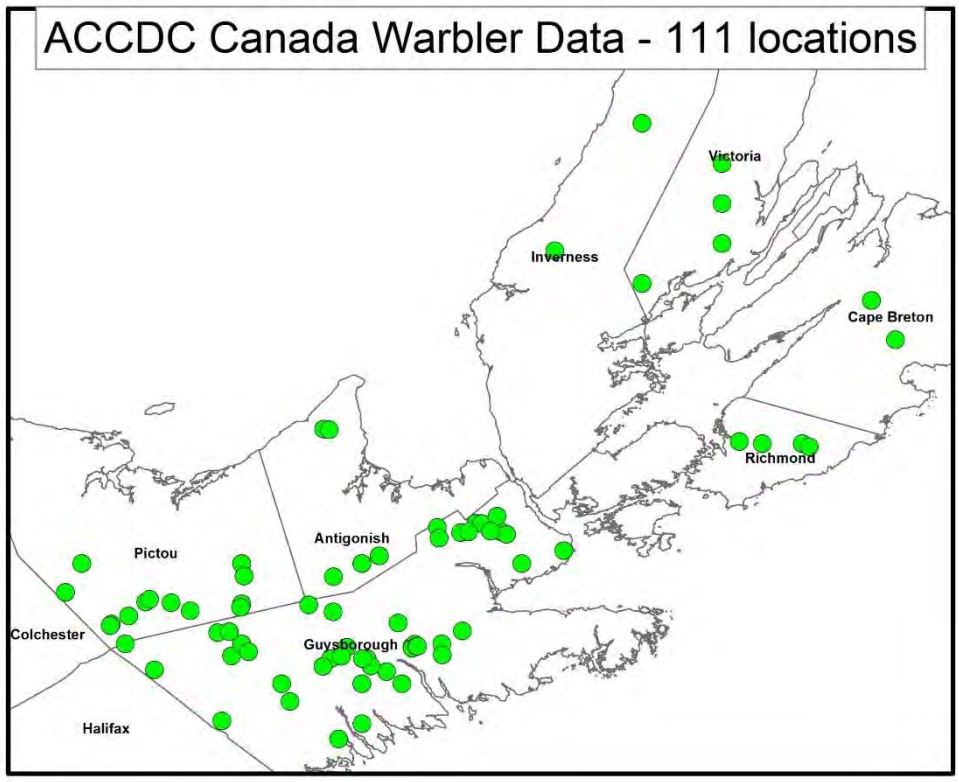

Source Data: Atlantic Canada Conservation Data Centre

Wood Thrush

Status:

National – Threatened

Provincial – Not Listed

Description

The Wood Thrush is a medium sized bird closely related to the American Robin. The Wood Thrush can be found throughout North America and winters in Central American and southern Mexico. Its decline is thought to have occurred due to cowbird parasitism, acid rain, loss of wintering habitat, and forest fragmentation in North America. The breeding range of the Wood Thrush includes mainland Nova Scotia where late-successional deciduous and mixed forests are preferred.

The Wood Thrush breeds in Ontario, Quebec, New Brunswick and mainland Nova Scotia. The Wood Thrush is not known to nest on Cape Breton Island. They are typically found in deciduous and mixedwood forests that have a complex understory of tree saplings and shrubs for nesting, mature tall trees for singing perches, and an open forest floor composed of leaf litter for foraging.
Nests are often laid near the ground in low branches of saplings including American Beech and Sugar Maple.

Distribution

The Wood Thrush is infrequently observed in scattered areas around mainland Nova Scotia. It winters in Central America.

HCV Decision

Wood Thrush is considered an HCV.

Management Approach

NSDNRR is currently renewing the provincial species at risk recovery programs by developing new recovery teams for listed species. As of April 2019, a new recovery team was established for all listed birds in the province. These teams will “set the goals and objectives to address data gaps or threats, monitor the success of recovery and provide recovery-related advice to government to resolve management questions” (www.novascotia.ca/news).

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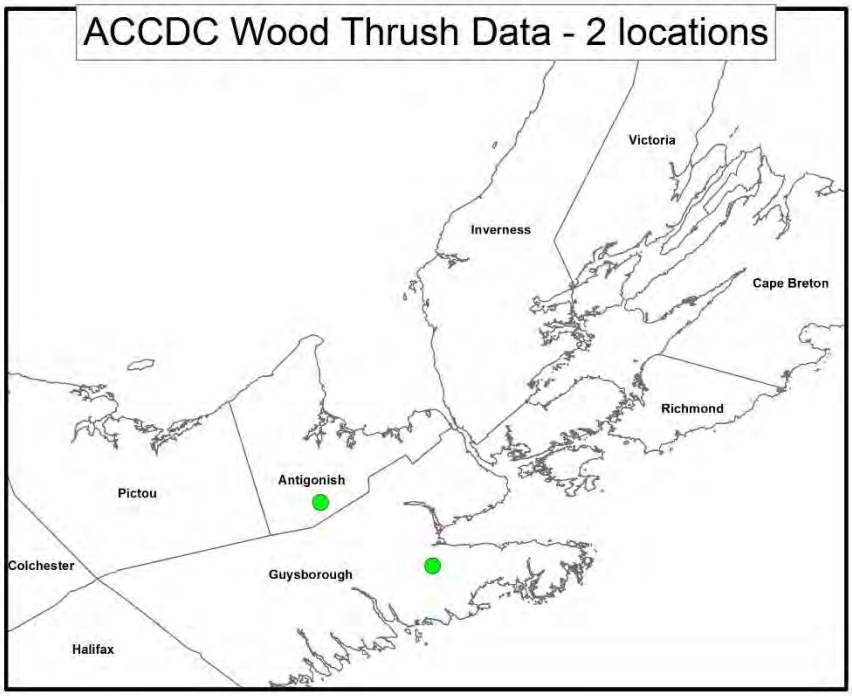


Source Data: Atlantic Canada Conservation Data Centre

Evening Grosbeak

Status:

National – Special Concern

Provincial – Vulnerable

Description

The COSEWIC Assessment and Status Report (2016) describes the Evening Grosbeak as "a stocky, boldly coloured songbird, with a massive greenish-yellow bill. Adult males have a dark brown head with a brilliant yellow supercilium; the brown of the head transitions to yellow upperparts and belly, contrasting with a black tail and black wings, with a distinct patch of all-white secondaries. Adult females and juveniles are generally greyish-brown with some yellow on the nape and flanks and black and white wings and tail. In summer, this species can be a major predator of the Spruce Budworm and helps in the natural control of this insect pest. In winter it is a familiar visitor to bird feeders." (p. iv)

The Evening Grosbeak breeds in Canada, the United States, and Mexico. It can be found in all Canadian provinces and territories except Nunavut. During the winter months, it can be found across broad geographic ranges if the seed source for feeding from boreal forests is abundant (COSEWIC 2016, p. iv).

Their breeding habitat generally includes open, mature mixedwood forests, where fir species and/or white spruce are dominant, and spruce budworm is abundant. Outside the breeding season, it depends largely on seed crops from firs and spruces in the boreal forest, but also attracted to ornamental trees and bird feeders.

Distribution

The Evening Grosbeak is found throughout Nova Scotia. It winters primarily in Canada and northern United States.

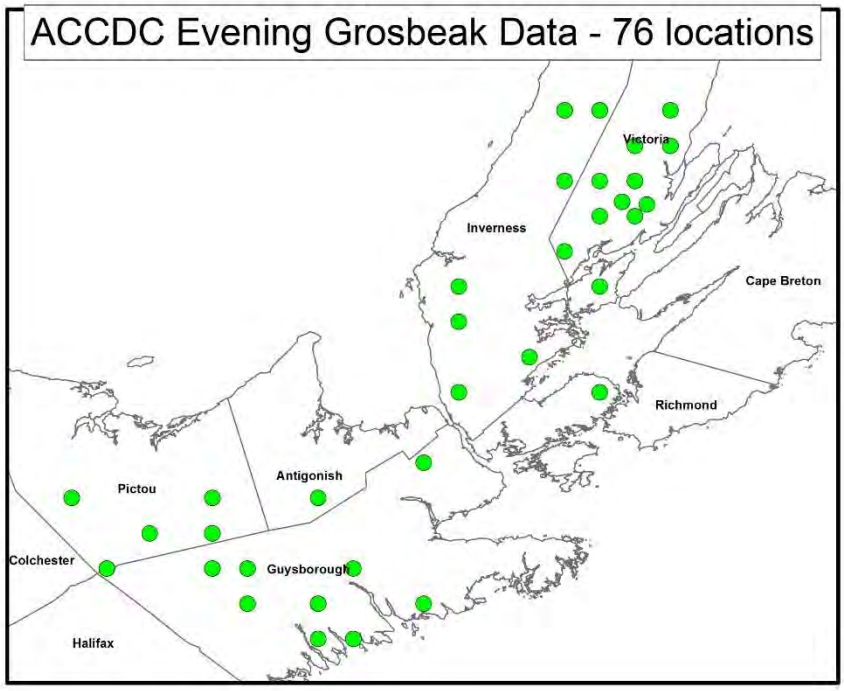
HCV Decision

Evening Grosbeak is considered an HCV.

Management Approach

NSDNRR is currently renewing the provincial species at risk recovery programs by developing new recovery teams for listed species. As of April 2019, a new recovery team was established for all listed birds in the province. These teams will "set the goals and objectives to address data gaps or threats, monitor the success of recovery and provide recovery-related advice to government to resolve management questions" (www.novascotia.ca/news).

Until specific Special Management Practices are identified by the provincial government, there are temporal exclusions during the breeding season (typically mid-April to end of August) when species occurrence data is within the vicinity of a planned forest management operation.



Source Data: Atlantic Canada Conservation Data Centre

HCV Lichens

Boreal Felt Lichen (Atlantic Population)

Status:

National – Endangered

Provincial – Endangered

Description

The boreal felt lichen is a globally imperilled cyanolichen that grows predominately on the branches and trunks of balsam fir trees in the cool and humid coastal forests of Nova Scotia and Newfoundland (COSEWIC 2002). This suboceanic species is found mostly on north- and east-facing slopes that are exposed to a constant supply of moisture from the coast. The known population in Atlantic Canada is less than 7000 thalli, with only 14 thalli known from Nova Scotia. The population is believed to have declined by approximately 90% over the past two decades (COSEWIC 2002).

Threats to the boreal felt lichen include atmospheric pollution, acid precipitation, habitat loss (*particularly from logging*), and habitat degradation. Other threats include forest pesticides, wildfires, climate change, and moose herbivory on balsam fir seedlings. Threats from the forestry industry specifically, include large-scale industrial forestry practices (*including pesticide use, clearcutting, and conversions to plantations*) (COSEWIC 2002). Clearcuts larger than 100m by 100m have been shown to have a negative impact on boreal felt lichen populations, and are believed to have led to the extirpation of some populations in Scandinavia (Holien et al. 1995). Clearcuts can increase genetic isolation and induce micro-climatic changes, such as decreased humidity due to an open canopy (Holien et al. 1995).

Distribution

The historic range of the boreal felt lichen includes the coastal forests of Atlantic Canada and Scandinavia, but the population is now believed to be restricted to Newfoundland and Nova Scotia. Local populations in Scandinavia, Prince Edward Island, and New Brunswick appear to have been extirpated. The vast majority of the global population of boreal felt lichen occurs in southeastern Newfoundland.

Potential boreal felt lichen habitat in Nova Scotia has been modelled and mapped by Nova Scotia Environment using a GIS predictive analysis that combines a number of habitat factors, including physiography, topography, forest cover, hydrology, and slope orientation (Cameron and Neily, 2008). The specific GIS algorithm that was used to develop this model queried the provincial forest cover layer for stands with balsam fir as a primary or secondary species and which occur within 80 meters of a mapped peatland (bog or fen), which was then further constrained to select only those stands within 30 kilometers of the Atlantic.

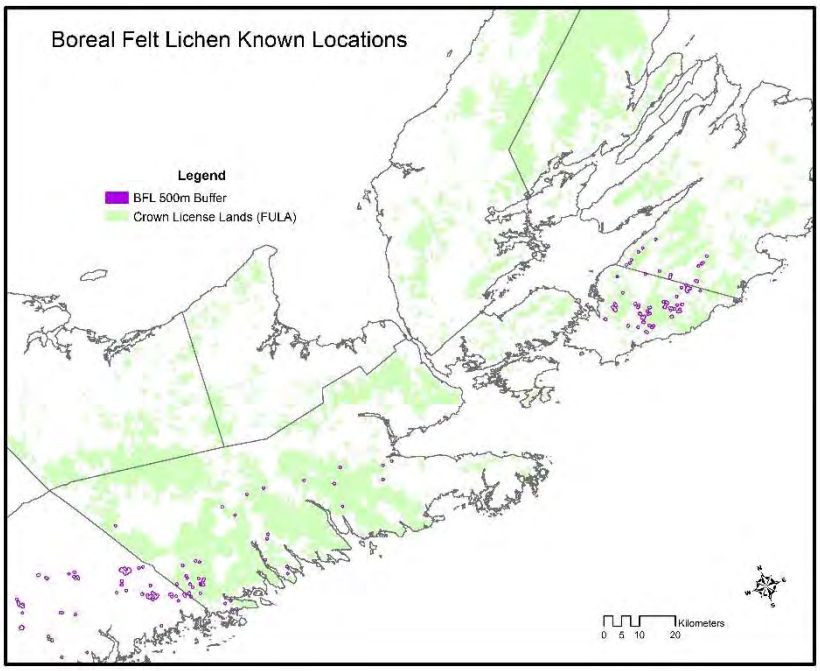
In 2002, COSEWIC documented that the species was known from only three locations in the province (totalling 14 thalli). To date, there are now 526 known locations across Nova Scotia with 227 of those existing on PHP's leased lands. Many of these new locations have been surveyed by the Mersey Tobeatic Research Institute (since 2005) and Port Hawkesbury Paper (since 2009).

HCV Decision

All known locations of boreal felt lichen within PHP's area of operation are considered HCVs.

Management Approach

As per provincial At-Risk Lichens Special Management Practices Policy, NSDNRR 2018, which is located here SMP_BFL_At-Risk-Lichens.pdf (novascotia.ca)



Frosted Glass Whiskers

Status:

National – Special Concern

Provincial – Not Listed

Description

Frosted glass-whiskers are a globally-rare species of stubble lichen known from only three locations in Canada. Where it is known to occur, the lichen grows on the exposed heartwood of red maple trees in late-seral and old-growth hardwood forest stands. Threats to the frosted glass-whiskers come mostly from habitat loss associated with the decrease in area of old-growth forests.

Distribution

There are currently 12 known locations of Frosted Glass Whiskers in PHP's operating area. These have been found during routine lichen surveys. A 100 meter no harvest buffer has been established around each location.

HCV Decision

Any location known to contain Frosted Glass Whiskers is considered an HCV.

Management Approach

In Nova Scotia, the provincial policy for At-Risk Lichens Special Management Practices (**SMP_BFL_At-Risk-Lichens.pdf (novascotia.ca)**) are implemented in areas identified by the provincial government.

Vole Ears Lichen

Status:

National – Endangered

Provincial – Endangered

Description

Vole Ears Lichen is a leafy lichen up to 12 cm across, with a felty upper surface that is grey-brown when dry and grey-green when wet. It is part of a group of rare cyanolichens found in the coastal forests of eastern North America. Vole Ears Lichen is rare and the Canadian population is the only remaining one in North America following its disappearance from the Great Smoky Mountains of Tennessee. The nearest extant populations are in Central America.

Distribution

The vole ears lichen in Nova Scotia is found on the Eastern Shore and the South Shore, which are both adjacent to the Atlantic Ocean. When growing very near the coast it is found in humid forests of sheltered bays or inlets. The habitat is typically in poorly drained depressions with mature coniferous or mixed forests dominated by Balsam Fir and/or *Acer rubrum* (Red Maple), with a ground flora dominated by *Sphagnum* species.

HCV Decision

Any location known to contain Vole Ears Lichen is considered an HCV. Currently, there are no known Vole Ears Lichen locations in PHP's operating area.

Management Approach

In Nova Scotia, the provincial policy for At-Risk Lichens Special Management Practices (**SMP_BFL_At-Risk-Lichens.pdf (novascotia.ca)**) are implemented in areas identified by the provincial government.

Blue Felt Lichen

Status:

National – Special Concern

Provincial – Vulnerable

Description

Blue felt lichen is a species of grey to blue-black or brown foliose lichen. It mostly grows on trees in undisturbed woodlands but occasionally on coastal rocks. It is found widely in Britain and western Ireland as well as in America and Canada, as it grows in maritime Atlantic climates. It is highly sensitive to acid rain and climatic changes.

Distribution

The blue felt lichen thrives in the Atlantic coastal forests of Nova Scotia. They are generally located in mixed forests containing red maple that are in wet depressions or adjacent to streams, rivers or lakes. Red maple can make up 50% of the tree species composition while balsam fir is also a common component, up to 30%. Outside of these red maple swales, this lichen can be found on the Atlantic coast near rivers and streams or adjacent to wetlands. It also occurs less frequently in deciduous forests on rich soil on hillside slopes as in the Cape Breton Highlands, on the North Mountain on the Fundy coast, and in the Cobequid Hills. It is most often found in humid micro-climates near seeps, vernal ponds or steep sided gullies.

HCV Decision

Any location known to contain Blue Felt Lichen is considered an HCV. Currently, there are 431 known locations of Blue Felt Lichen in PHP's operating area.

Management Approach

In Nova Scotia, the provincial policy for At-Risk Lichens Special Management Practices (**SMP_BFL_At-Risk-Lichens.pdf (novascotia.ca)**) are implemented in areas identified by the provincial government.

Black-foam Lichen

Status:

National – Threatened

Provincial – Threatened

Description

The COSEWIC Assessment and Status Report (2015) describes the black-foam lichen as "a leafy lichen that grows as greenish grey rosettes up to 20 cm across on the trunks of deciduous trees. The 1-2 mm wide solid lobes rest on a thick spongy black tissue made of fungal filaments. The reddish brown fruit bodies on the upper surface contain sacks that are unusual in containing a large number of tiny spores that provide its only means of reproduction." (p. iv)

The Black-foam lichen is found throughout North America, however there is only one known location in Russia. The lichen has been found in Ontario and Quebec, but no longer seem to occur in these provinces. The last known recorded location of the black-foam lichen in New Brunswick was approximately 10 years ago, while it appears widespread but not common in Nova Scotia (COSEWIC, 2015). It is thought to occur most commonly throughout southwestern Nova Scotia (Tom Neily, pers. comm).

Distribution

The Black-foam lichen are predominately found in the western and central parts of Nova Scotia. There are three known locations on PHP's Crown license in the western end of Guysborough County.

HCV Decision

Black-foam lichen is considered an HCV.

Management Approach

In Nova Scotia, the provincial policy for At-Risk Lichens Special Management Practices (**SMP_BFL_At-Risk-Lichens.pdf (novascotia.ca)**) are implemented in areas identified by the provincial government.

Wrinkled Shingle Lichen

Status:

National – Threatened

Provincial – Threatened

Description

The COSEWIC Assessment and Status Report (2017) describes the Wrinkled Shingle Lichen as a "leafy lichen forming patches or rosettes that can be up to 10 cm across. It almost always grows on the trunks of deciduous trees. The upper surface is brownish grey and wrinkled. The photosynthetic partner is a cyanobacterium." (p. iv)

The lichen is known to occur in 56 locations. In the Maritime provinces, 49 are located in Nova Scotia with four in New Brunswick, two in Newfoundland and one in Prince Edward Island (COSEWIC 2017, p. iv).

Distribution

In Nova Scotia, the Wrinkled Shingle Lichen is often found along the edges of treed swamps or riparian floodplains, and usually at the base of moderate to steep slopes. They are often found on deciduous trees in imperfectly drained, humid habitats. There is one known location on PHP's Crown license area.

HCV Decision

Wrinkle Shingle Lichen is considered an HCV.

Management Approach

In Nova Scotia, the provincial policy for At-Risk Lichens Special Management Practices (**SMP_BFL_At-Risk-Lichens.pdf (novascotia.ca)**) are implemented in areas identified by the provincial government.

HCV Vascular Plants

New Jersey Rush

Status:

National – Special Concern

Provincial – Vulnerable

Description

New Jersey rush is a coastal plain flora species that is endemic to eastern North America. It inhabits the edges of infertile bogs and fens and, like most other coastal plain flora species, is dependent upon moderate natural disturbance regimes to reduce inter-specific competition from woody shrubs. The local distribution of this species within a wetland environment appears to be strongly correlated with hydrologic patterns, particularly seasonal flooding (COSEWIC 2004a).

Threats to the New Jersey rush come mostly from wetland alteration caused by drainage, in-filling, and prolonged flooding. The species is also threatened by encroachment from roads and development, logging of adjacent habitat (*particularly clearcutting which can alter local hydrology*), and trampling from heavy all-terrain vehicle use (COSEWIC 2004a).

Distribution

New Jersey rush is found at isolated spots on the coastal plain of eastern North America, in New Jersey, Maryland, Virginia, North Carolina, and Nova Scotia. The Nova Scotia population is known from sixteen bogs and fens in southeastern Cape Breton Island from Port Michaud to Fourchu Bay and inland to Lock Lomond (COSEWIC 2004a, NSDNRR 2007). These occurrences are disjunct from other coastal plain flora areas in Nova Scotia, which are mostly located along the lakes and rivers of the southwestern portion of the province.

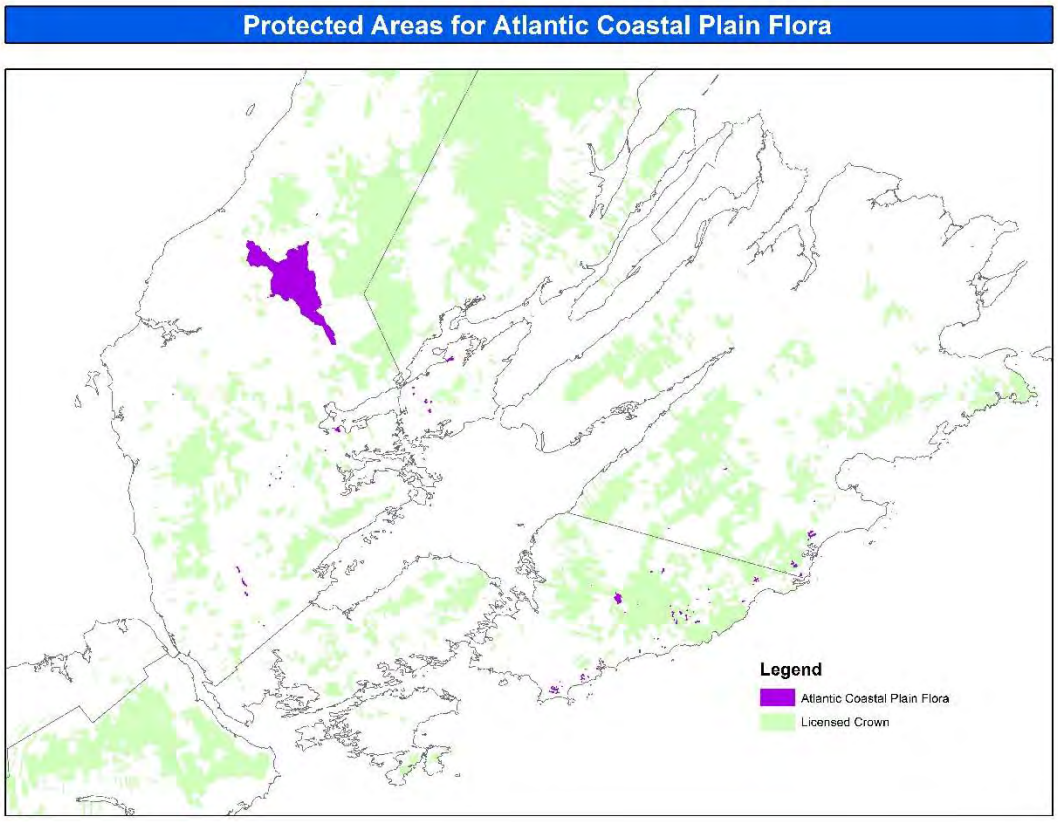
New Jersey rush occurrences in Nova Scotia are well mapped with a high degree of confidence based on field-verification. Spatial distributions for the HCV assessment come from the significant habitat database from NSDNRR, which shows a total of 283.4 hectares of New Jersey rush habitat within PHP's area of operation. This represents roughly 81.9% of all mapped occurrences in Nova Scotia, which also constitutes a significant proportion of the global population of this species as well. Specific locations of New Jersey rush (currently 64 point locations on PHP's Crown lease) are also mapped by the Atlantic Canada Conservation Data Centre (ACCDC).

HCV Decision

All wetlands containing New Jersey rush are considered HCVs. These areas are spatially-delineated using NSDNRR's significant habitat database and the ACCDC spatial location data.

Management Approach

Known locations of New Jersey Rush are protected through the Atlantic Coastal Plain Flora dataset which is provided by NSDNRR.



Eastern White Cedar

Status:

National – Not Listed

Provincial – Vulnerable

Description

The eastern white cedar is naturally rare in Nova Scotia, with anthropogenic disturbances having caused further declines in the abundance and distribution of this species. Current population estimates range from 13,000 to 15,000 stems located in thirty-two widely scattered stands. In Nova Scotia, eastern white cedar is known to inhabit swamps, lakeside forests, woodlands, old fields, and riparian zones. Soil drainage and pH are likely important factors influencing local distribution patterns (Newell 2005).

Threats to the eastern white cedar come mostly from stand conversions. In recent years, several stands have been lost to forest harvesting and highway construction. Others are threatened by conversions to agricultural fields. Elsewhere, browsing by deer and snowshoe hare can be a limiting factor for seedling regeneration (Newell 2005).

Distribution

Eastern white cedar occurs in North America from the Canadian Maritime Provinces west to Manitoba, including the Great Lakes region and New England States. Remnant populations occur in isolated pockets further south, at higher elevations in the Appalachian Mountains.

In the Maritimes, eastern white cedar is much more abundant in New Brunswick and Prince Edward Island than in Nova Scotia, where only thirty-two existing stands are documented, all of which occur in the western five counties of the province (Newell 2005). These occurrences have all been field-verified within the past three years. Historical documents suggest that cedar also likely occurs elsewhere within the province, including Pictou and Antigonish Counties where PHP carries out forestry operations, though current distributions are uncertain.

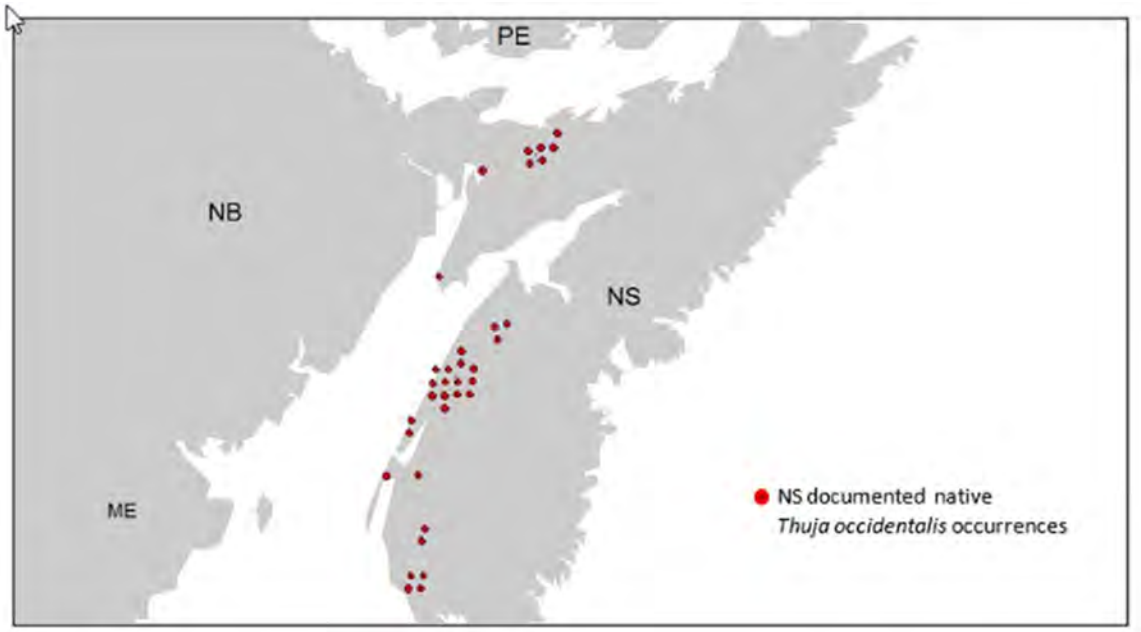
HCV Decision

Queries of the NSDNRR forest inventory, as well as reviews of the rare species databases from NSDNRR, NSE, and ACDCC, did not identify eastern white cedar stands for lands managed by PHP.

No known stands of eastern white cedar occur within PHP's area of operation. No HCV areas are designated for this species at this time.

Management Approach

Due to the possibility that eastern white cedar stands may occur within PHP's area of operation, particularly in Pictou and Antigonish counties, the company will educate its employees and contractors on how to identify this species in the field. If any occurrences are detected, either through initial surveying or during actual operations, the NSDNRR will be notified and these stands will be immediately protected and no harvesting will be allowed to occur within these sites.



Source: A Management Plan for Native Occurrences of Eastern White Cedar in Nova Scotia, 2010

Black Ash

Status:

National – Threatened

Provincial – Threatened

Description

Black Ash is a broad-leaved hardwood tree in the Olive family, growing to 15 to 20 m in height and 30 to 50 cm in diameter. The opposite, pinnately-compound leaves are 15 to 30 cm, with seven to 11 leaflets. The small flowers lack petals and sepals and appear in crowded clusters prior to leaf out. Fruit are elongated, winged samaras. Stalkless leaflets, samaras winged to the base, and a gap between the terminal and nearest lateral buds distinguish Black Ash from other ash species.

Black Ash wood is highly flexible and readily separates into thin strips, making it useful in applications requiring bending. It has been important for barrel hoops, chair seats, snowshoe frames and canoe ribs, and remains significant for use in First Nations basketry. The durable wood is valued commercially for tool handles, furniture, interior finishing and flooring. Numerous First Nations medicinal uses are reported, and it is commercially available in horticulture. Black Ash is a dominant species in many swamp forest and riparian ecosystems, in which it provides food and shelter for many species, including at least ten Canadian ash-specialist arthropods.

Distribution

Perhaps due to the significance of black ash to the Mi'kmaq in Nova Scotia, there is no readily available map showing the population range or locations of black ash.

HCV Decision

Any location known to contain Black Ash is considered an HCV.

Management Approach

PHP staff and contractors are aware that if black ash is found, the tree or forest stand is to be left and NS Department of Natural Resources and Renewables is to be immediately notified. An occurrence of a Black Ash stand was found in Cape Breton **in 2021** during a routine PHP pre-assessment and is now considered a conserved area with no allowed forest management activities.

HCV Reptiles

Wood Turtle

Status:

National – Threatened

Provincial – Endangered

Description

The current wood turtle population in Nova Scotia is estimated to be around ~2500 individuals. This species is particularly susceptible to anthropogenic influences, where even slight increases in the mortality rate can have significant impacts on the population due to its low reproduction rate, geographic isolation of meta-populations, and its late age of maturation (NSDNRR 2007a).

Threats to the wood turtle come mostly from road mortality (e.g. *direct collisions as well as indirect impacts from increasing road densities and increasing frequency of use*), collecting and pet trading, increases in predation by species adapted to human environments (*e.g. racoons*), and the alteration and destruction of habitat, particularly conversions of floodplains. Threats generally posed by the forestry industry include road mortality (*both on-site and off-site*), mortality from harvesting equipment, improper road construction, increasing road densities, damage to riparian areas, and disturbance to forest nesting sites from short-term changes in hydrology following clearcutting (MacGregor and Elderkin 2003, NSDNRR 2007a).

Distribution

Wood turtles occur in eastern North America from Nova Scotia and New Brunswick, south to Virginia, and west through Southern Quebec and Southern Ontario to Minnesota and Iowa. The species is widespread within its range, but occurs at low densities. The wood turtle commonly inhabits forested areas near riparian zones, and can be found at significant distances inland from a watercourse.

In Nova Scotia, wood turtles are reported from 31 different watersheds, though several of these sightings may represent translocated individuals not part of a breeding population. A significant proportion of the provincial wood turtle population occurs on lands managed by PHP, in eastern mainland Nova Scotia and on Cape Breton Island. The St. Mary's River watershed, in particular, contains the highest population of wood turtles in Nova Scotia and represents some of the best remaining wood turtle habitat globally. At least 80% of this watershed is considered significant wood turtle areas by NSDNRR, particularly along the main river course and between the east and west branches of the St. Mary's River (MacGregor and Elderkin 2003). Other significant watersheds in Nova Scotia containing wood turtles include River Denys and River Inhabitants on Cape Breton Island (MacGregor and Elderkin 2003).

The federal government further identified critical habitat for wood turtle in 2016 under the recovery strategy for wood turtle. These areas, which are spatially mapped, are not available for any forest management activities.

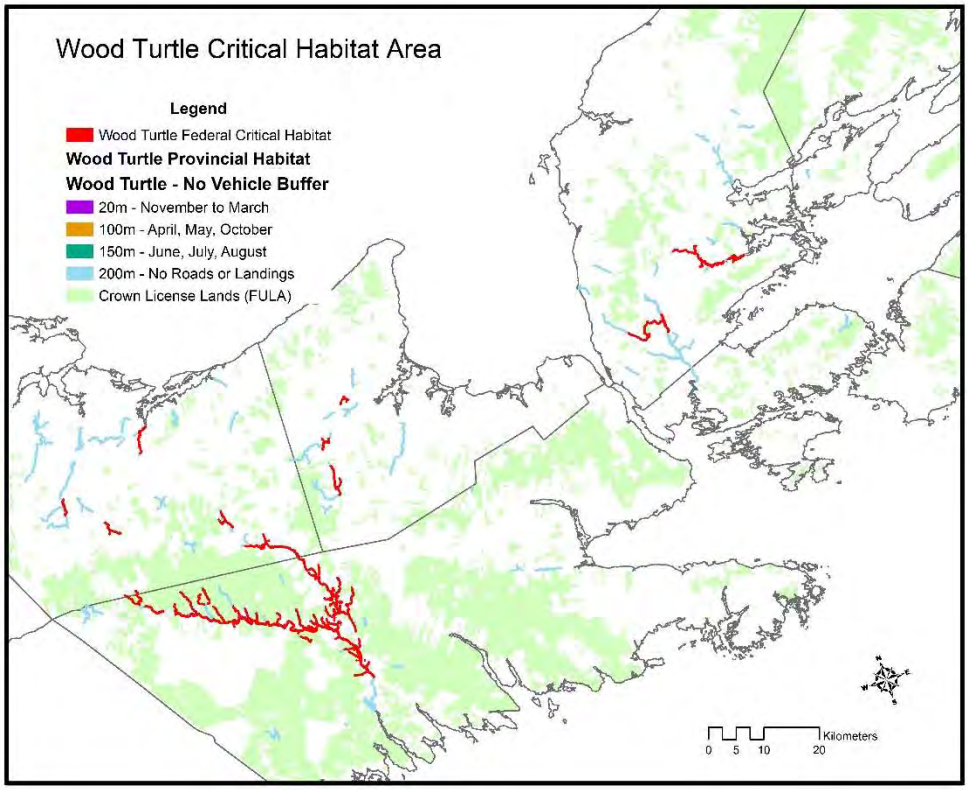
HCV Decision

Areas identified by the Nova Scotia government are considered HCVs and fall within the provincial Wood Turtle Special Management Practices Policy of 2012. Critical habitat areas identified by the federal government are also HCVs and not available for forest management.

Management Approach

In Nova Scotia, the provincial policy for Wood Turtle Special Management Practices (**Microsoft Word - Special Management Practices for Wood Turtles.doc (novascotia.ca)**) are implemented in areas identified by the provincial government.

Areas identified as critical habitat under the federal recovery strategy for wood turtle are not available for forest management activities.

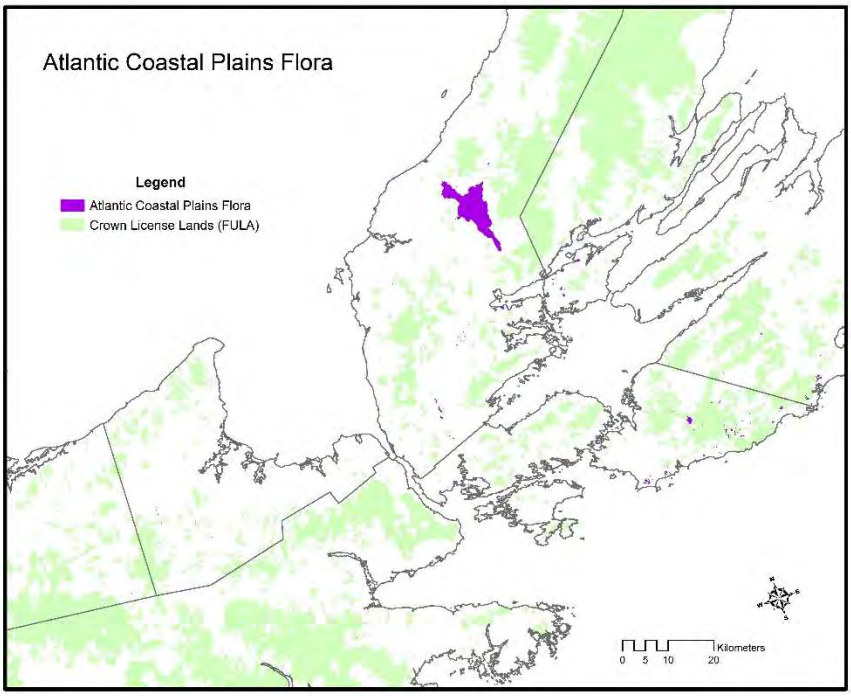


Question 2.

Does the forest contain a globally, nationally or regionally significant concentration of endemic species?

Atlantic Coastal Plains Flora (ACPF), inhabiting lake and river sides, bogs, fens, and estuaries are 90 species of taxonomically unrelated wetland plants. Other than Nova Scotia, some of these plants are unique to Canada. Eleven of these plants are threatened species, which indicates that they run the risk of going extinct in the absence of conservation and recovery efforts. Federal and provincial laws provide legal protection for these 11 plants (NCC: Atlantic Coastal Plains Flora (ACPF) (natureconservancy.ca).

In Nova Scotia, the provincial government has developed an Atlantic Coastal Plains Flora GIS dataset. This dataset contains several vascular plant ACPFs. This dataset is provided to PHP as a protected area layer. No forest management activities occur within these ACPF areas as shown in the below map.



Question 3. Does the forest include critical habitat containing globally, nationally or regionally significant seasonal concentration of species (one or several species, e.g. concentrations of wildlife in breeding sites, wintering sites, migration sites, migration routes or corridors – latitudinal as well as altitudinal, watershed level forests or riparian forests associated with high value fisheries habitat?

Nova Scotia is located along the Atlantic Flyway and is an important stopover location for numerous species and populations of migratory birds. As a result, globally-, nationally-, and regionally-significant concentrations of birds occur at various sites across the province, particularly coastal and estuarine sites. Many of these places have been mapped by IBA Canada. These include:

- Basque Islands and Michaud Point (NS045)
  - Canada Goose
  - Colonial Waterbirds/Seabirds
  - Common Eider
  - Great Cormorant
  - Waterfowl
- Big Glace Bay Lake (NS007)
  - Canada Goose
- Cape North (NS030)
  - Bicknell's Thrush
  - Boreal Owl
- Central Cape Breton Highlands (NS061)
  - Bicknell's Thrush
- Eastern Shore Islands (NS027)
  - Common Eider
  - Harlequin Duck
  - Waterfowl
- Portnova Islands (NS006)
  - Great Cormorant
- Rocks off Fourchu Head (NS047)
  - Great Cormorant
- Scatarie Island (NS052)
  - Bicknell's Thrush
- The Capes (NS057)
  - Black-legged Kittiwake
  - Great Cormorant

Most of these IBA sites are rocky coastal islands or headlands. The only sites containing potentially operable forest include Cape North, Central Cape Breton Highlands, and Scatarie Island. The Scaterie Island IBA site is located within the boundaries of a legally-designated protected wilderness area. No harvesting is permitted to occur within this site. Coastal IBA sites are not impacted by PHP's forest management activities, therefore, no special management practices are required.

IBA sites Cape North and Central Cape Breton Highlands have been addressed in Category 1, Question 1 for Bicknell's thrush. Additionally, the Cape North IBA site contains significant concentrations of Boreal owl. For this area, no harvesting currently occurs and is not expected to occur in the future. Should harvest plans be developed, this will be re-visited.

<u>Aquatic Ecosystems</u>

The Atlantic salmon (*Salmo salar*) is an anadromous fish species, spending most of its life cycle in the oceans but spawning in freshwater streams. The species is distributed throughout the North Atlantic from the Eastern Seaboard of the United States north to Ungava Bay, and across the Atlantic Ocean past Greenland and Iceland to Western Europe and Scandinavia (ASF 2007). Some Atlantic salmon populations are landlocked, spending their entire life-cycle in freshwater environments.

Over the past several decades, the population of Atlantic salmon has suffered steep declines, dropping to less than 100,000 individuals overall in the mid- to late-1990's (ASF 2007). Several populations are considered endangered, such as the Inner Bay of Fundy population (COSEWIC 2007), and numerous salmon runs in the southern portion of the species' range have gone extinct in recent years. In Nova Scotia, there are several important rivers that support Atlantic salmon populations (e.g. Margaree River, St. Mary's River, Middle River, East River, West River (Pictou and Antigonish counties).

The brook trout (*Salvelinus fontinalis*) is also an important fish species in Nova Scotia. It is more widely distributed across the province than Atlantic salmon and is an important indicator of water quality and ecosystem integrity. During the past several decades, both the Atlantic salmon and brook trout populations have suffered sharp declines, due to a combination of pressures from over-fishing, habitat degradation, acid precipitation, pollution, and competition from invasive species, among other factors.
HCV Decision:

Seventeen watersheds were identified within PHP's area of operation where the company maintains cutting rights to a high proportion of the total area of the watershed, including both the St. Mary's River and Margaree River watersheds (these watersheds are HCVs under Question 12), and six watersheds containing municipal watershed areas (*e.g. water supply areas*). These areas contain important aquatic resources. All public lands managed by PHP within these seventeen watersheds are considered to be HCVs. These watersheds are:

- Antigonish Municipal Watersheds
- Guysborough Municipal Watershed - 1
- Inverness Municipal Watersheds
- Pictou Municipal Watersheds
- Victoria Municipal Watersheds
- Guysbourough Municipal Watershed - 2
- Baddeck River
- East River
- Grand River
- Liscomb River
- Margaree River
- Middle River
- Mira River
- New Harbour River
- North River
- River Inhabitants
- St Marys River

Cold-water refugia streams for Atlantic salmon and brook trout were identified through research carried out by the Nova Scotia Department of Aquaculture and Fisheries. For the HCV designations, cold-water streams have been buffered by 100 meters for management purposes.

Management approach:

- To maintain normal long-term hydrologic functions within the seventeen identified watershed areas, PHP will ensure that at least 80% of the productive forest within these special management watersheds will be maintained in a closed forest condition (> 12 years of age) at any given moment in time.

- Streams identified as HCVs for salmon and trout cold-water refugia will be managed to maintain as much thermal cover as possible. This will be done by ensuring all harvest treatments within 100 meters of cold-water refugia streams will maintain a minimum 50% crown closure. The only exception will be for forest stands containing a high proportion of non-wind firm trees, such as balsam fir or white spruce that are vulnerable to wind blowdown. In these cases, the management objective, where naturally feasible, will be to restore the forest to species that are longer-lived and more resistant to wind disturbances. Furthermore, no management activities will occur within 20 meters of the cold-water refugia streams. No intensive forestry will occur within the cold-water refugia HCV's.

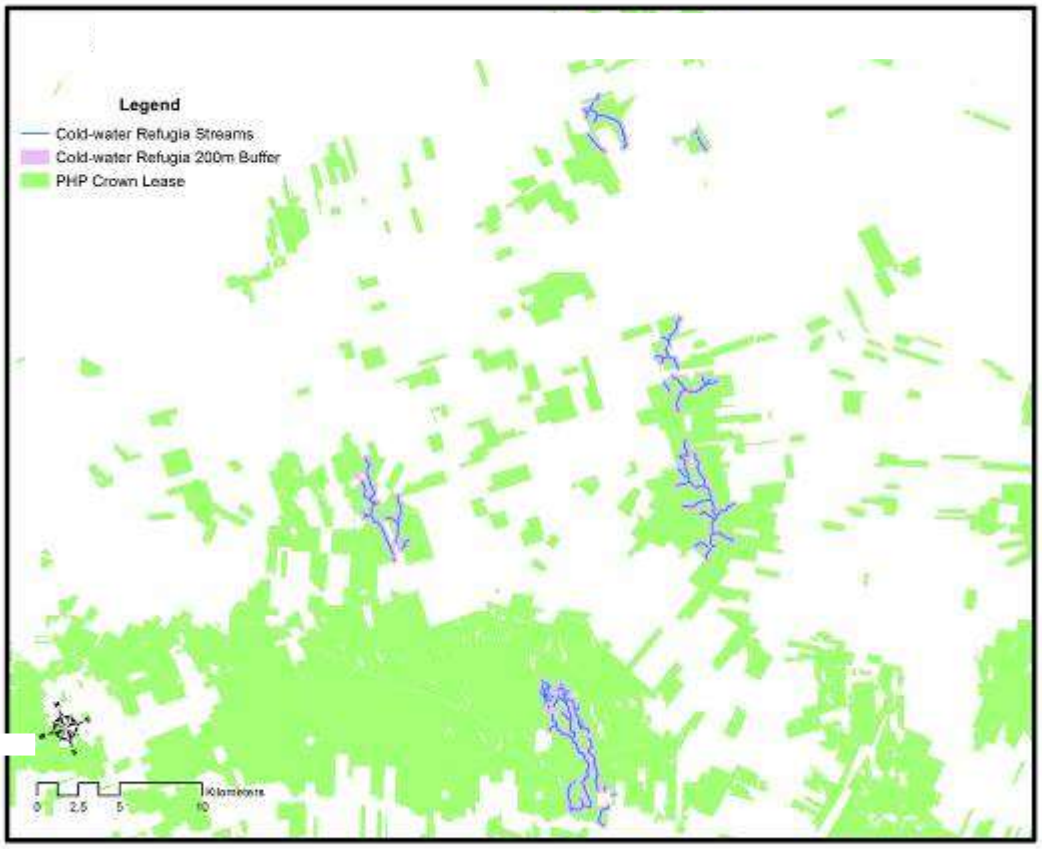


Figure 7-22. Cold-water Refugia Streams with 100 m Management Buffer - Mainland HCV's (NS Department of Aquaculture and Fisheries)

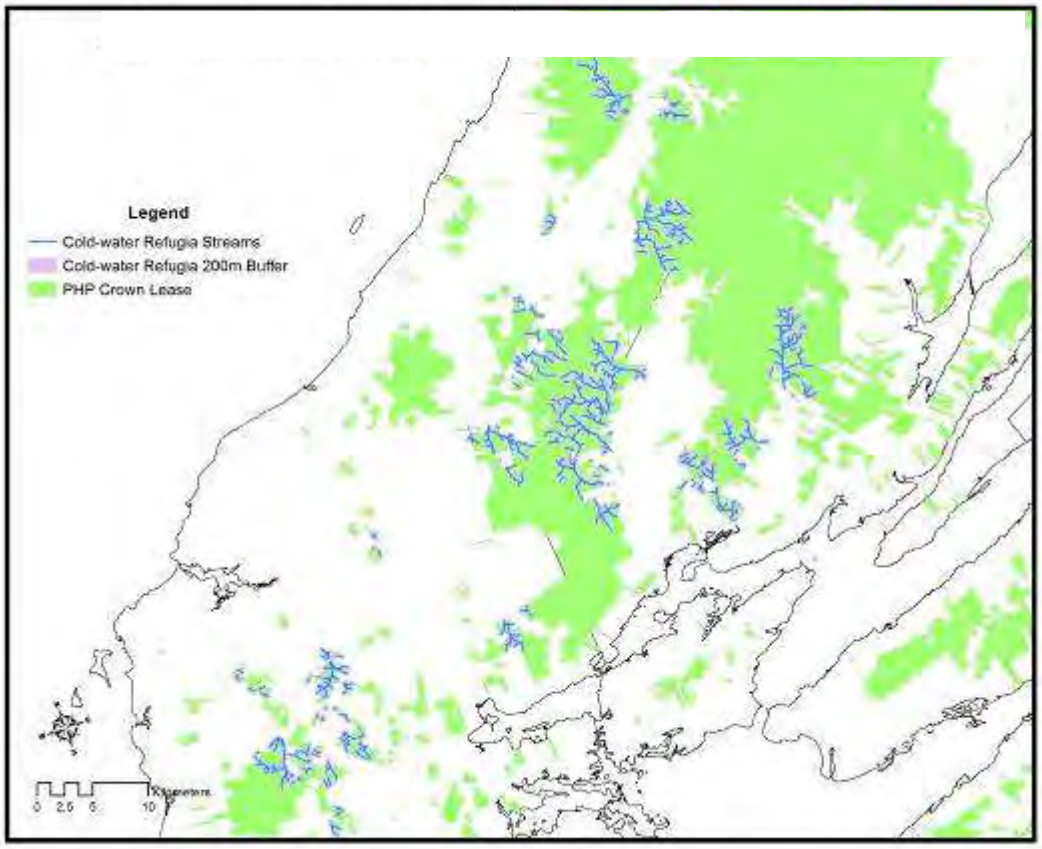


Figure 7-23. Cold-water Refugia Streams with 100 m Management Buffer - Cape Breton HCV's (NS Department of Aquaculture and Fisheries)

Question 4. Does the forest contain critical habitat for regionally significant species (e.g., species representative of habitat types naturally occurring in the management unit, focal species, species declining regionally, including concentrations of aquatic species whose habitat is dependent on riparian forest or watershed condition?

Red spruce (*Picea rubens*)

Red Spruce

The red spruce tree is native to the forests of eastern North America and is a defining species in the Acadian forest. It is a long-lived, shade-tolerant coniferous species that tends to occupy moist, but well-drained soils. In Nova Scotia, the species often forms homogenous stands or is found in close association with white pine and hemlock. It sometimes forms hybrids with black spruce where ranges overlap.

Red spruce is a regionally-significant species in the Acadian forest that is currently under-represented in late-seral and old forest conditions. In Nova Scotia, the species is most common through the southwest and central portions of the province, and begins to transition to black spruce-dominated forests in the eastern mainland counties of Pictou, Antigonish, and Guysborough. Only a few isolated and widely-scattered stands of red spruce are known to occur on Cape Breton Island.

HCV Decision:

A total of 1,882 hectares is identified as red spruce stands in the provincial forest inventory on PHP lands. These stands are typically found in the western portion of PHP's operating area in eastern Mainland Nova Scotia. All natural red spruce stands are considered HCV's.

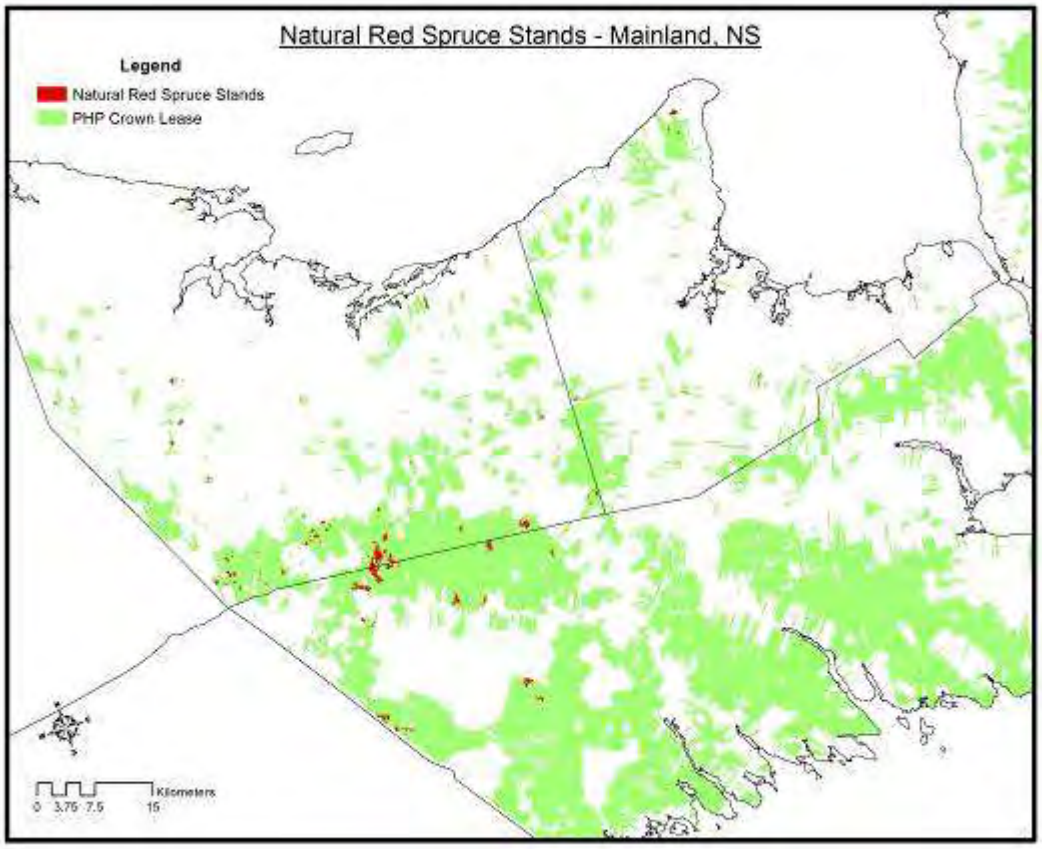


Figure 7-24. Red Spruce Stands – Mainland, Nova Scotia

Management approach:

- Several existing natural mature red spruce stands within PHP's area of operation occurring in an uneven-aged condition are currently off-limits to harvesting and are fully-protected as old forest sites designated by NSDNRR. These areas will remain fully-protected by PHP. For additional information, refer to Category 3, Question #9).

- Red Spruce Management Work Instruction Summary: PHP is committed to maintaining red spruce stands within its area of operation and to improving the quality of these stands over time. This will involve re-establishing uneven-aged conditions. To accomplish this, PHP will implement the following management objectives:

  Red Spruce Dominated Stands

  - Strive for two to three cohort stand structures.
  - Over time, we will strive to increase the area of multiple ages in many stands.
  - Promote natural red spruce regeneration
  - At harvest (other than tending), trees should be large and of high value. Management (spacings, thinnings) should be carried out to help meet this objective.

- Retain overstory structure, including snags; future snags; other tolerant species; and residual red spruce component – both individuals when windfirm and in clumps (structure and seed).

Immature stands

The option for immature red spruce stands is to partially remove the overstory in 2-3+ stages separated by a period of 10 to 20 years. The trees retained should be windfirm and quality immature trees. This helps ensure increased value of residual stand and regeneration establishment, and subsequent regeneration release(s).

Maturing stands

As a preferred option, a modified shelterwood treatment providing increased retention will be implemented, with a plan for two ages initially, with the intent of a third as the newly regenerated stand grows into the existing overstory canopy. As possible, considering tree ages and wind firmness:

Step One: Initial shelterwood harvest is modified to include more patch retention, by doubling the present wildlife clump retention – move to 20 trees per hectare, with patches scattered throughout the treatment area (i.e. an irregular shelterwood)

Step Two (once regeneration is 60 cm tall at 5-10 yrs): Overstory harvest to release regeneration is needed (regeneration protection harvest techniques implemented). The retention includes both small patches of residuals, as well as individuals (as available, few isolated pines/hemlock/hardwoods, and snags with designated red spruce retention). Ten living trees per hectare are required. Shelterwood completed with adequate established regeneration.

Step Three (15-35 yrs): The young and immature stand is tended as it grows (space – thin).

Longer term: As trees grow into the upper canopy, some of the patches and individual trees will be harvested, excluding designated wildlife clumps and legacy trees.

At this time (in the future), three cohorts are introduced in to the stand with the intent of patterning an uneven-aged structure.

In some instances, trees in the forest stand planned for treatment are not wind-firm and excessive blowdown and significant wood losses would occur following implementing one of the treatments described above. If the stand is determined to be a high risk for blowdown, an alternative treatment may be implemented (eg. strip cuts), or it should be left to grow until maturity then harvested.

Other Regionally Significant Species

Other regionally significant species identified are listed below. These species are addressed in other sections of the HCV report as identified.

- White elm (Category 3, Question 9)
- Red oak (Category 3, Question 9)
- Hemlock (Category 3, Question 8 & 9)

- Black ash (Category 3, Question 9)
- Jack pine (Category 3, Question 9)
- Wood turtle (Category 1, Question 1)

Question 5. Does the forest support concentrations of species at the edge of their natural ranges or outlier populations?

Nova Scotia is located geographically where a number of species reach the edges of their natural ranges, including outlier populations. In fact, the Acadian forest is defined, in part, by its mixture of southern broadleaf species with northern needleleaf species. This is a characteristic feature of the forests in this region. Being located at the edge of the continent, Nova Scotia is also positioned at the natural eastern range limit for many species distributed in an east-west direction at this latitude in North America.

Other notable range-limit and outlier populations in Nova Scotia include arctic-alpine plants, boreal forest elements, and coastal plain flora populations.

Arctic-Alpine plants

A number of arctic-alpine plants occur in isolated spots around Nova Scotia, particularly exposed coastal areas with poor soils and rocky inland barrens. These plants are relicts of early post-glacial time, around 10,000 years BP, when Nova Scotia was predominately tundra. Small populations of these arctic-alpine plants survived in the harshest locations of the province, where they could not be competitively excluded by faster-growing plants as the climate warmed.

Boreal Forest Elements

Nova Scotia contains some of the most southerly boreal forest remnants on the planet, concentrated mostly on the plateau of the Cape Breton Highlands and exposed coastal areas along the Atlantic and Bay of Fundy coasts. Species compositions in these areas are similar to the boreal forest ecosystems elsewhere in eastern North America, dominated by *Abies balsamea*, *Picea mariana*, and *Larix laricina*, with *Betula papyrifera* and *Populus tremuloides*. These forests are prone to large-scale natural disturbance events associated with insect infestations and wildfires. Similarly with other areas of the circumpolar boreal forest zone, peatland ecosystems are abundant in these forests, particularly plateau-bogs and shoreline-fens. The boreal forest ecosystems in Nova Scotia are remnants of a once much more widespread post-glacial forest, from a time period approximately 8,000 years ago when the climate of Nova Scotia was significantly cooler than present. Throughout most of Nova Scotia, the boreal forest was replaced by the modern mixed coniferous-deciduous Acadian forest by approximately 5,000 years BP.

HCV Decision:

No HCVs are designated specifically for this criterion, dealing with range limits and outlier populations.

Range limits associated with the southern and northern species of the Acadian forest are dealt with throughout the various categories of the HCV assessment (*e.g. red spruce management, Category #1,*

Question #4; old-forest protection, Category #3, Question #9). Boreal forest outliers are covered in the HCV category for the protection of large-landscape level forests, which are distributed disproportionately in the boreal forest zones of Nova Scotia (*e.g. Category #2*). Coastal plain flora outliers occurring within PHP's area of operation are covered in the section dealing endemic species (*Category #1, Question #2).*

Management approach:

- No HCV's are designated for this question, therefore, no special management approaches are required at this time (refer to other sections of report as noted above).

Question 6.
Does the forest lie within, adjacent to, or contain a conservation area: (a) designated by an international authority, (b) legally designated or proposed by relevant federal/provincial/territorial legislative body, or (c) identified in regional land use plans or conservation plans?

Rationale

Protected areas are critical for the protection of biodiversity. They provide a foundation upon which other conservation measures can be applied and are the few remaining places on the landscape where nature is allowed to function without undue human intervention or manipulation. It is important to recognize, however, that anthropogenic activities undertaken outside or immediately adjacent to protected areas can still have significant impacts on the ecosystems contained within the protected areas themselves. This makes it imperative for adjacent land-use practices to be considered as part of the protected areas management itself. PHP is committed to ensuring that harvesting and silviculture practices undertaken adjacent to protected areas will not negatively impact the ecosystems contained therein.

Methods

All existing protected areas in Nova Scotia were assembled into a single GIS layer, including both legally-protected sites (*federal and provincial*) and sites that are administratively-protected (*provincial and PHP*).

<u>Legally-protected</u>

- National Parks (*Federal*) T9
- Migratory Bird Sanctuaries (*Federal*) T10
- Wilderness Areas (*Provincial*) T4
- Nature Reserves (*Provincial*) T5a
- Provincial Parks (*Provincial*) T1
- Designated Provincial Park Reserves (*Provincial*) T1

Administratively-protected

- Sites of ecological significance (*Provincial*) T5b
- International Biological Programme sites (*Provincial*) T5b
- Old forest zones (*Provincial*)
- PHP Protected Areas

These protected areas provide the spatial delineations for establishing buffer zones around protected sites, and subsequently developing management approaches to lessen the intensity of forestry operations near protected areas. A number of new protected areas have also been identified by the Nova Scotia Department Environment & Climate Change and are pending legal protection. These sites are considered part of this analysis as well.

Results

Federal and Provincial Protected Area

The below table and figure show federal and provincial protected areas located in PHP's forest management area.

Table 5: Protected Areas

Protected Area Category	# of Sites	Total Hectares
Existing & Pending Legal Protected Area	113	308,408
TOTAL HECTARES		**303,332**

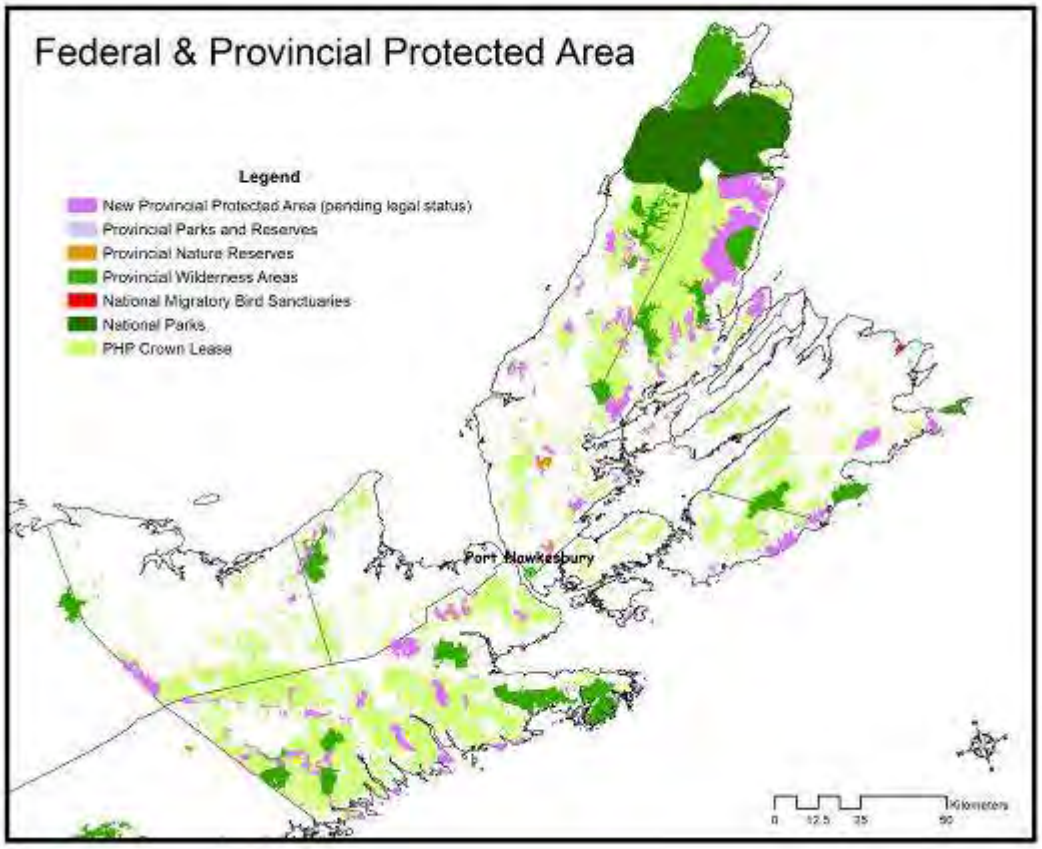


Figure 7-27. Federal and Provincial Protected Area

Eigg Mountain – James River
Provincial Wilderness Area
Photo: Matthew McKenna, PHP

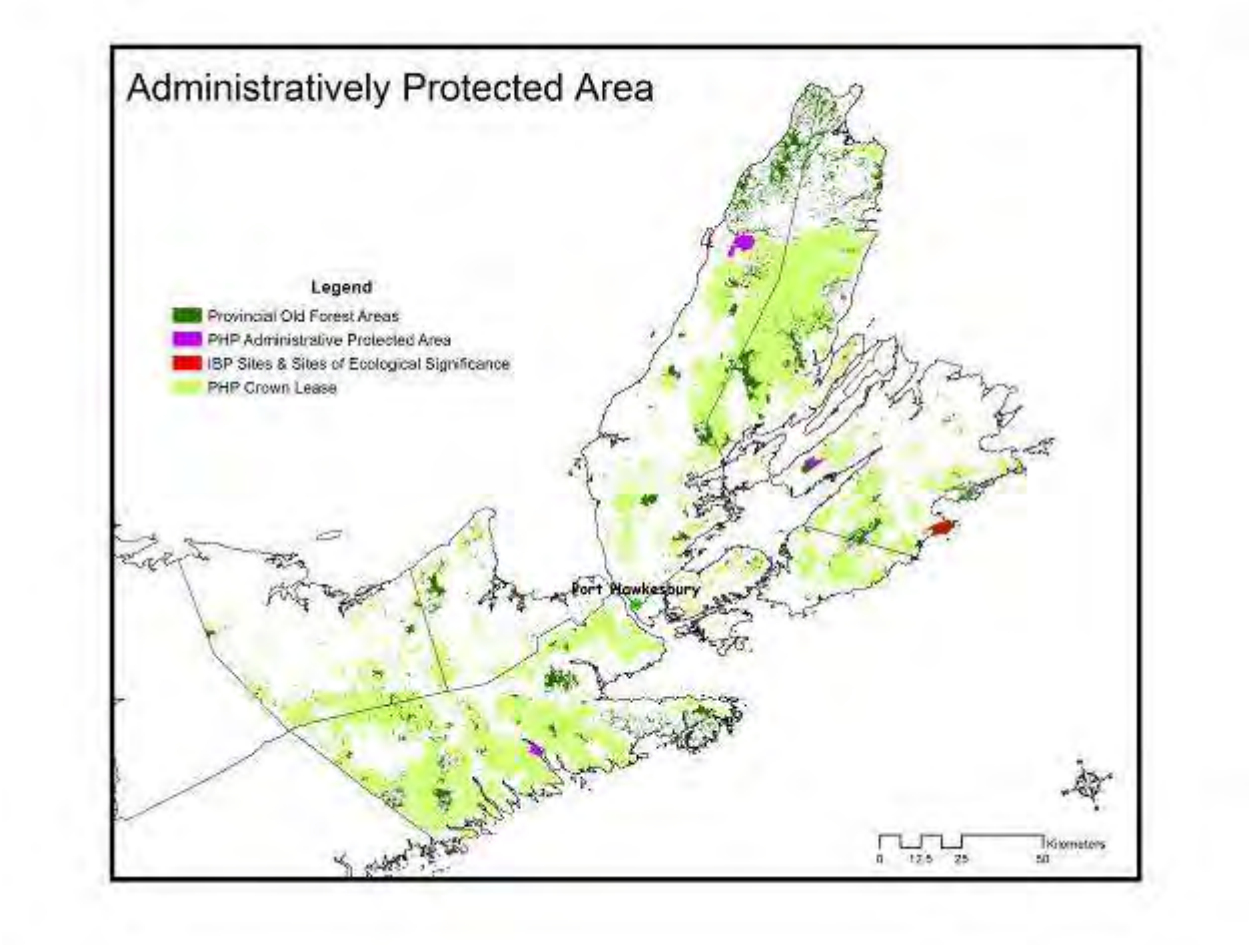
French River
Provincial Wilderness Area
Photo © N.S. Department of Natural Resources and

Administratively Protected Area

The below table and figure show administratively protected areas located in PHP's forest management area.

Table 6: Administrative Protected Area

Administratively Protected Area Category	# of Sites	Total Hectares
Old Growth Areas	N/A	84,717
PHP Protected Area	8	6,147
IBP Sites & Sites of Ecological Significance	12	3,107
TOTAL HECTARES		**93,971**



HCV Decision:

All existing protected areas within PHP's area of operation (e.g. *legally-protected and administratively-protected*) are considered HCVs. Also, a 200 m wide Special Management Zone will be placed around all existing protected areas to minimize road impacts to adjacent protected areas.

Management approach

- No harvesting is permitted to occur within any of the legal and administratively protected areas, as per provincial legislation and regulations, and company policies.

- A 200 meter wide Special Management Zone will be placed around all existing protected areas, in which the primary forest management objective will be Acadian forest restoration. No intensive forestry (e.g. plantations, exotics) will occur within these zones and road construction will be minimized to reduce access points into the protected areas. Where roads are required, they will be built parallel to protected area boundaries, and where practical, will not be built within 100 meters of protected area boundaries.

Indigenous Protected & Conserved Area (IPCA)

Indigenous governments play a key role in maintaining and conserving ecosystems on IPCAs, which are lands and bodies of water, through Indigenous laws, systems of governance, and knowledge. An IPCA's heart and soul are its culture and language. In terms of governance and management goals, IPCAs differ. However, they typically have three things in common:

- IPCAs are Indigenous-led
- IPCAs represent a long-term commitment to conservation
- IPCAs elevate Indigenous rights and responsibilities

Through an initiative led by the Unama'ki Institute of Natural Resources (UINR), the first IPCA has been identified for Nova Scotia and awaiting official designation. The IPCA area, located near the First Nations community of Eskasoni, has been a part of PHP's Crown license area and through discussions with UINR and the IPCA Program Manager, PHP has been able to assist with GIS support, data and information in the delineation of the IPCA, as well as provide additional information for the identification of connectivity corridors to link to a future planned IPCA in Kelly's Mountain.

Currently, the Eskasoni IPCA is considered a HCV with additional areas expected in the future. The total size of the Eskasoni IPCA is 6,655 hectares. This area is mapped and in PHP's GIS system as a protected area, therefore, permitting no forest management activities.

6.0 CATEGORY 2: LARGE LANDSCAPE LEVEL FORESTS

Category 2: Landscape-level ecosystems and mosaics. Intact Forest Landscapes and large landscape-level ecosystems and ecosystem mosaics that are significant at global, national or regional levels, and that contain viable populations of the great majority of the naturally occurring species in natural patterns of distribution and abundance.

Question 7.
Does the forest constitute or form part of a globally, nationally or regionally significant forest landscape that includes populations of most native species and sufficient habitat such that there is a high likelihood of long-term species persistence?

Rationale

Large landscape level forests are important for the long-term conservation of biodiversity in the Acadian forest region. These areas are more likely to contain viable populations of naturally occurring species in their normal habitat ranges than smaller fragmented forests. Unfortunately, few large landscape level forests remain in Nova Scotia, or more broadly within the Northern Appalachian / Acadian Ecoregion (NAAE).

Methods

HCV's within PHP's forest management area were previously identified in 2008 for protected areas, large landscape forests, and forest remnant patches and included within the company's 2010 HCV report for FSC certification.

HCV sites were included primarily using polygons from an early stage of the Colin Stewart Forest Forum (CSFF) discussions, recognizing that further work was required at the time to refine this list and a level of uncertainty would remain until formal designations by the Nova Scotia government were finalized.

The approach used at the time for the HCV work was to "cast-the-net" wider than was ultimately required to fulfill requirements for protected areas and the maintenance of large landscape level forests and forest remnant patches. A harvest moratorium was placed on these HCV areas to create space for completing the CSFF discussions and the provincial protected areas process that followed.

The CSFF process was officially completed in December 2009, when the final CSFF report for recommended protected areas was submitted to the Nova Scotia government. Using the CSFF report, the provincial government continued the protected areas process, involving several rounds of public and stakeholder consultations, resulting in a final protected areas proposal released in August 2013.
Now that both the CSFF process and the Nova Scotia government's protected areas planning process are complete, and the uncertainty associated with these two processes no longer exists, an update to the PHP HCV moratorium sites was required.

Port Hawkesbury Paper LP established an HCV review committee in June 2014 to assess HCV sites under moratorium in the 2010 report. This committee included representation from the company, the Nova Scotia government, ENGO's, and academics.

The purpose of the HCV review committee was to refine the HCV sites for protected areas, large landscape forests, and forest remnant patches by systematically reviewing sites under moratorium. More specifically, the committee was striving to (1) decide which moratorium sites were no longer required as HCVs, and (2) for those moratorium sites determined by the committee to still be required for HCVs, to modify boundaries using best available information and expert advice and develop appropriate management prescriptions.

In 2017, a new advice note was issued by FSC Canada regarding Motion 65: High Conservation Value 2 (HCVF2) – Intact Forest Landscapes (IFL) Protection. The definition of an IFL by Global Forest Watch is:

A territory within today's global extent of forest cover which contains forest and non-forest ecosystems minimally influenced by human economic activity, with an area of at least 500 km2 (50,000 ha) and a minimal width of 10 km (measured as the diameter of a circle that is entirely inscribed within the boundaries of the territory) (Source: Glossary definition as provided on Intact Forest website. 2006-2014).

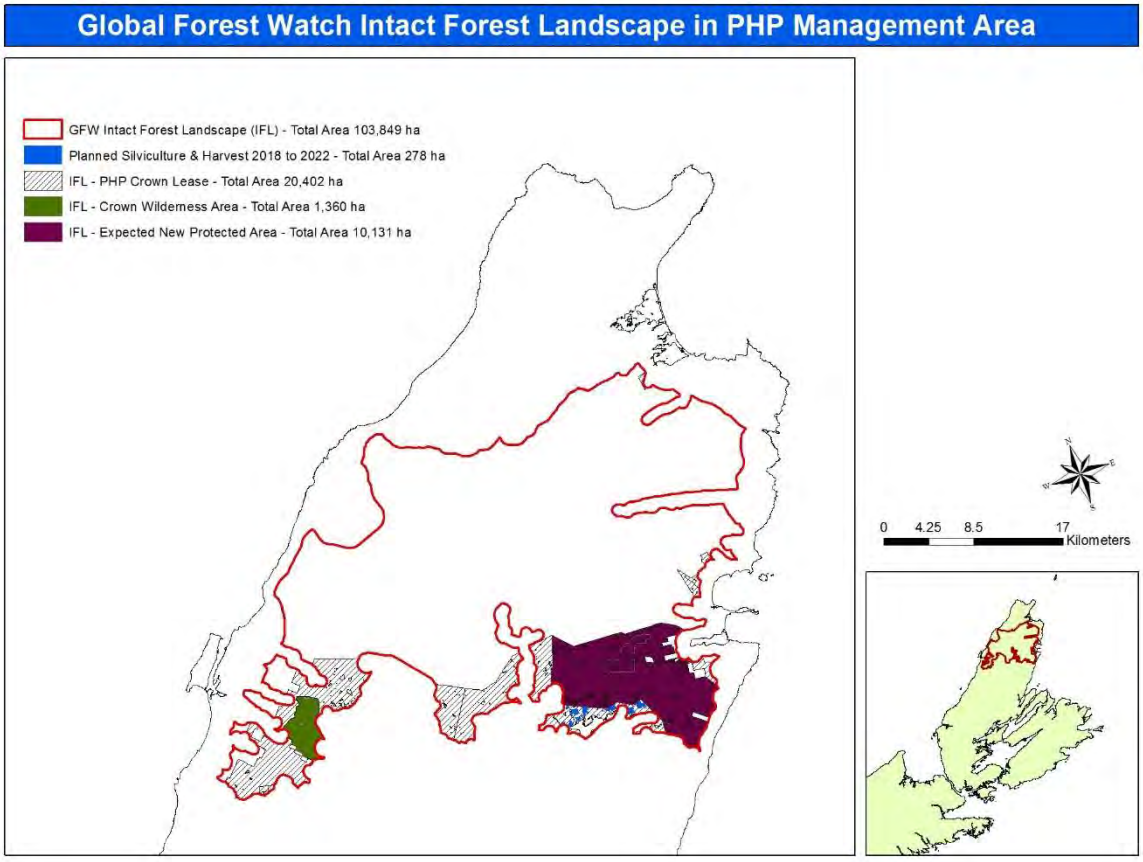
The FSC advice note requires certificate holders to use Global Forest Watch IFL maps, or a more recent IFL inventory using the same methodology, such as Global Forest Watch Canada, as a baseline for identifying IFLs. If an IFL is identified on a certificate holder's management area, forest management operations, including harvesting and road building may occur in IFLs, if they:

- Do not impact more than 20% of Intact Forest Landscapes within the company's Management Unit, and
- Do not reduce any IFLs below the 50,000 ha threshold in the landscape.

Port Hawkesbury Paper referred to Global Forest Watch Canada's IFL GIS data and identified an IFL in Cape Breton.

Intact Forest Landscapes

There is one known Intact Forest Landscape as identified by Global Forest Watch Canada in PHP's forest management area. It is 103,849 ha and encompasses the Cape Breton Highlands National Park as well as other area outside the park. The total area of Crown land managed by PHP inside the IFL is 20,402 ha (20%). Of that 20%, approximately 10,000 ha has been identified as a pending new protected area by the provincial government with an existing additional 1,260 ha already established as a Crown Wilderness Area. These pending and existing protected areas are included in PHP's Crown license area. Approximately 9% of remaining area is potential operable forest area. When calculating the impact of PHP's operations in the IFL, the total area to be assessed will be 20,402 ha. PHP's total allowable harvest area in the portion of the IFL in the management unit is 4,080 ha. Monitoring and reporting of this IFL will be included in PHP's Annual Monitoring Report.



Protected areas

The final report of the CSFF recommended 84,502 ha within the PHP tenure be established as protected areas. Most of these CSFF recommended sites were ultimately approved by the Nova Scotia government for protection and were included in the final protected areas plan released in August 2013. These sites are now in the process of being officially designated by the province, and PHP is supportive of this process. This fulfillment of the CSFF recommendations is a major contribution toward protected areas within PHP's lease. See Question 6 in this report for more detailed information on all legal (and pending) and administratively protected areas.

Even when the CSFF-recommended sites are officially designated as protected areas, however, a few gaps in ecosystem representation still remain in the protected areas system.

Upon reviewing all of the moratorium sites, the HCV review committee recommended establishing several "administrative protected areas" that will be voluntarily protected by PHP. A total of eight administrative protected areas were identified, totaling 6,147 hectares. These sites include: Country Harbour, Boisedale Hills, Hill Lake, Jim Campbells Barren, North River, Oban, Mason's Mountain, and Salmon Gaspereaux. The management prescription for these areas is "no management activities (harvest, road building, silviculture)" (see Question 6).

Large Landscape HCVs

Large landscape forests (identified by HCV review committee as greater than 10,000 hectares in size) occur predominately in the Cape Breton Highlands. For these sites, the predominate approach utilized to protect this value is through the creation of new protected areas, but also through the establishment of "core roadless areas". For remnant forest patches less than 10,000 hectares in size, and are scattered more widely in Cape Breton and eastern mainland Nova Scotia, decisions were made on a site-by-site basis. Management decisions for large landscape and remant patch include protected areas, core roadless areas, and/or special management areas.

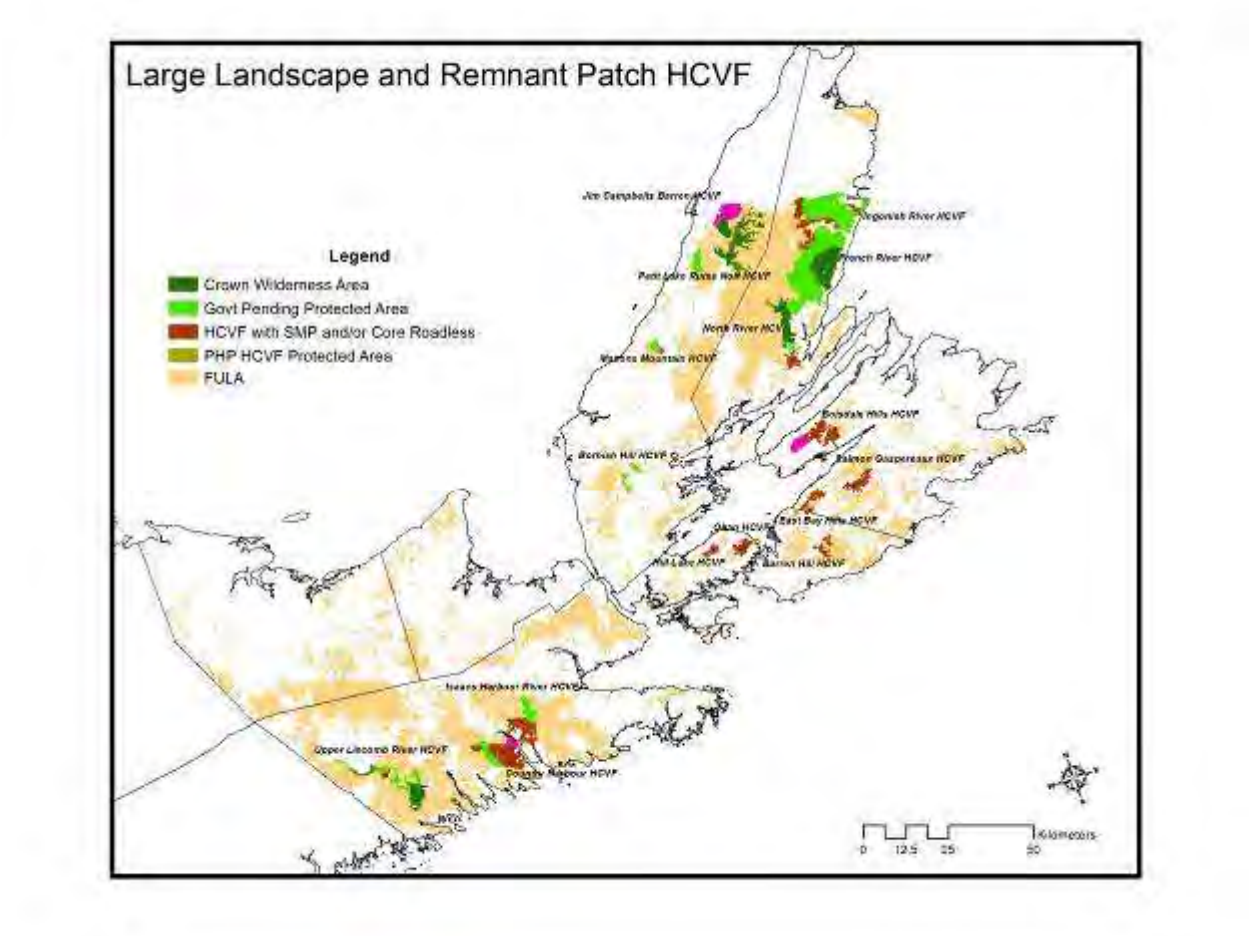


Figure 8-1. Large landscape and remnant patch HCV.

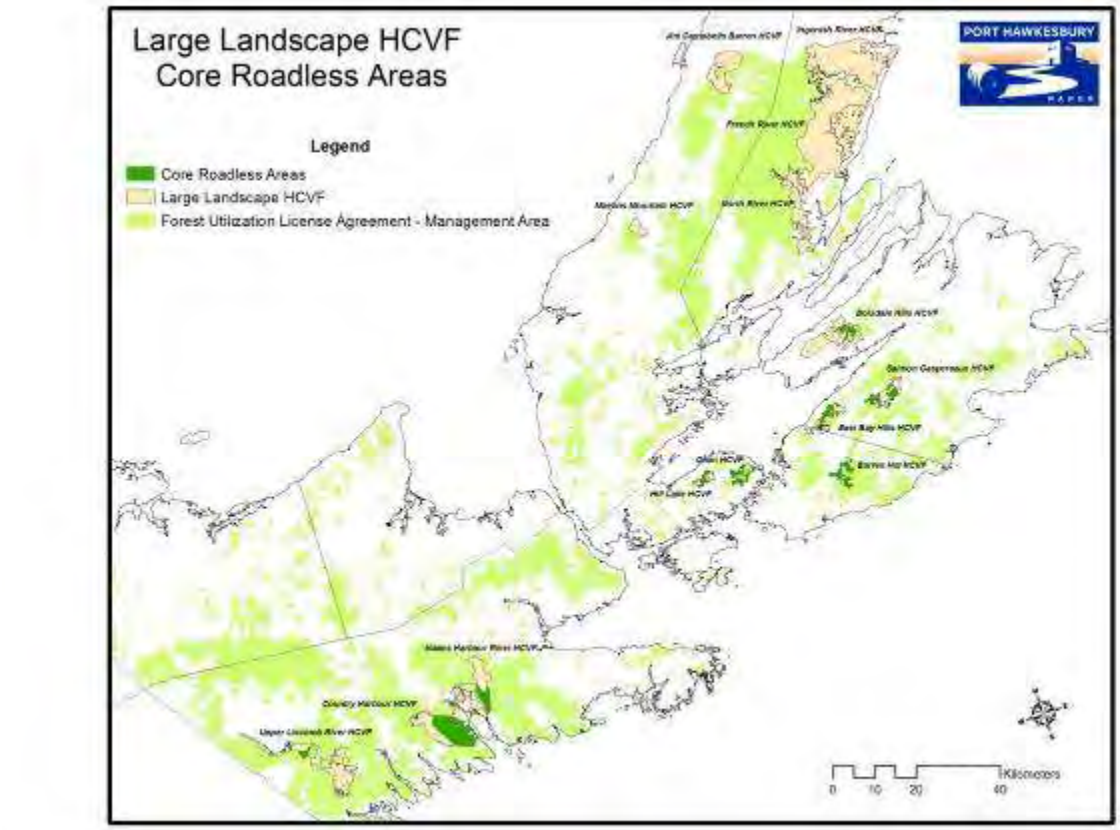


Figure 8-2. Core roadless areas within Large Landscape and Remant Patch HCVs.

Large landscape and remnant patch site-by-site assessments

Below is a summary table listing the review outcome by the 2014/15 HCV committee for the original 34 CSFF moratorium sites identified in the 2010 HCV Assessment Report. A total of 16 sites will remain as HCV's while the remaining 18 are removed since the outcome of the provincial planning process for new protected areas show these sites to now be adequately represented for protection.

Original CSFF Name	Proposed HCV Status	Total Hectares	HCV Category
Barren Hill	Maintain HCV	1,318	Remnant Patch
Boisdale Hills	Maintain HCV	5,630	Remnant Patch
Bornish Hill	Maintain HCV	2,106	Remnant Patch
Country Harbour	Maintain HCV	8,202	Remnant Patch
East Bay Hills	Maintain HCV	1,865	Remnant Patch
French River	Maintain HCV	25,226	Large Landscape
Hill Lake	Maintain HCV	877	Remnant Patch
Ingonish River	Maintain HCV	15,210	Large Landscape
Isaacs Harbour River	Maintain HCV	6,157	Remnant Patch
Jim Campbells Barren	Maintain HCV	4,586	Remnant Patch
Masons Mountain	Maintain HCV	1,022	Remnant Patch

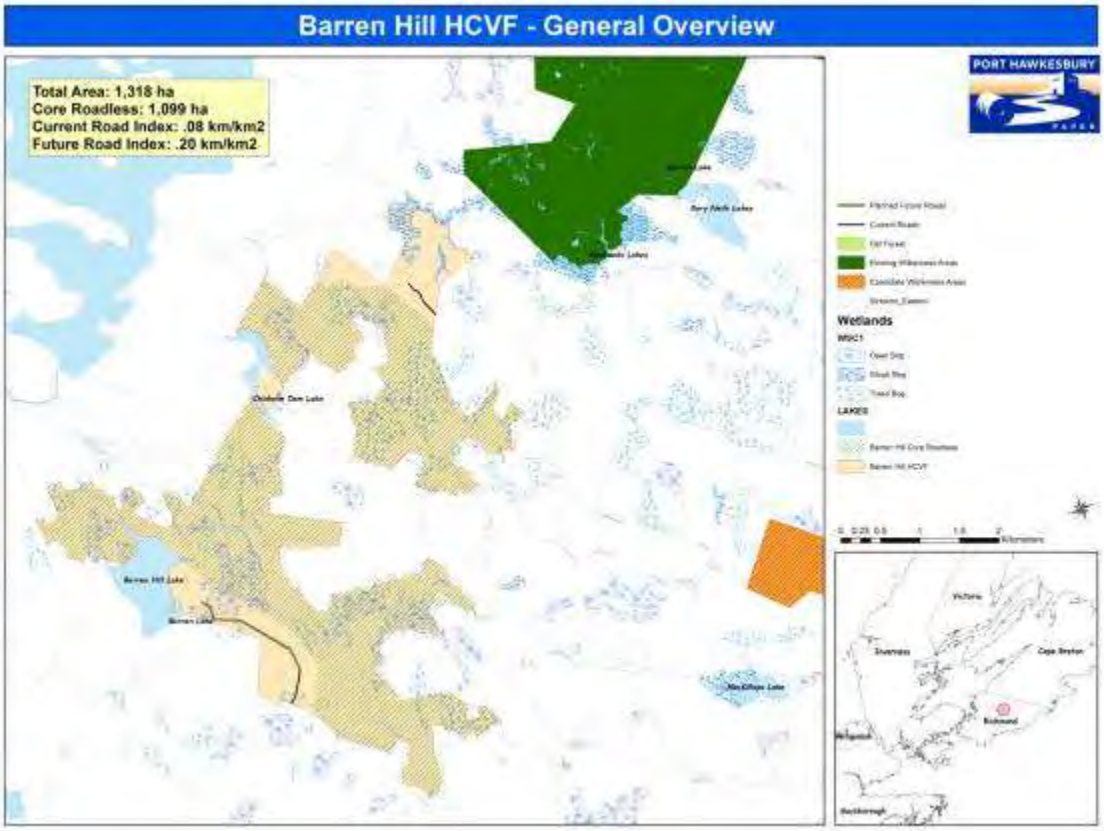
North River	Maintain HCV	6,328	Remnant Patch
Oban	Maintain HCV	1,618	Remnant Patch
Petit Lake Ruiss Noir	Maintain HCV	1,612	Remnant Patch
Salmon Gaspereaux	Maintain HCV	2,357	Remnant Patch
Upper Liscomb River	Maintain HCV	7,398	Remnant Patch
Upper Liscomb River 2	Remove HCV		
Cranberry Lake	Remove HCV		
West Lakes	Remove HCV		
Liscomb River	Remove HCV		
Margaree River	Remove HCV		
Capelin Cove	Remove HCV		
Cross Lake Salmon River	Remove HCV		
Dover Bay	Remove HCV		
Fishermans Harbour	Remove HCV		
Fourchu	Remove HCV		
Humes River	Remove HCV		
Kluscap Mountain	Remove HCV		
Twelve O Clock Mountain	Remove HCV		
Middle River - Framboise	Remove HCV		
Canso Coastal Barrens	Remove HCV		
Middle River	Remove HCV		
Ogden Round Lake	Remove HCV		
Bonnet Lake Barrens	Remove HCV		

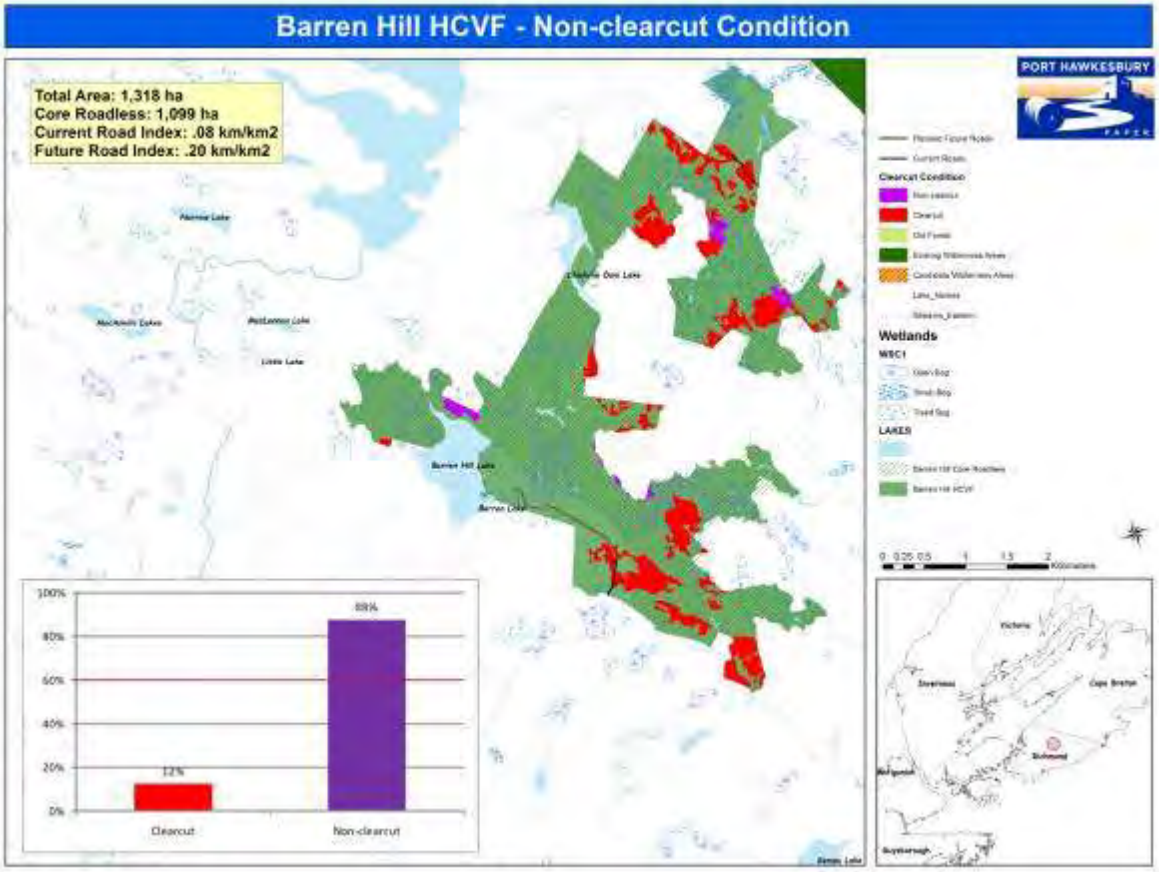
The following table and maps show details for each HCV site including total area, area of HCV for special management and/or protection (legal and/or administrative), core roadless area (if applicable), current and future road index values, and non-clearcut condition. Management prescriptions for all HCV's follow the maps.

HCV Name	Core Roadless Management (ha)	Special Management (ha)	Government Protected (legal & pending) (ha)	PHP Protected (ha)	Total Hectares
Barren Hill	1,099	219	-	-	1,318

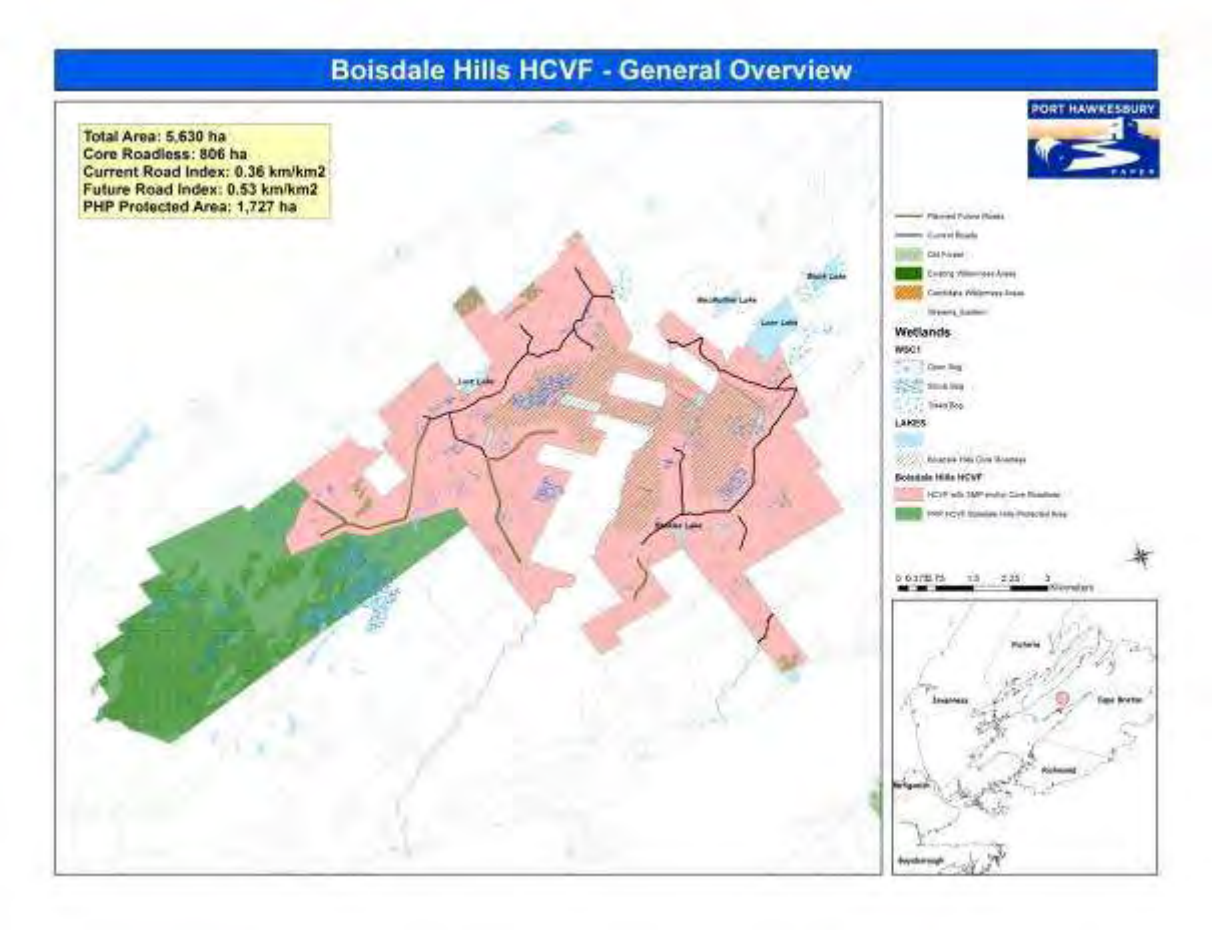
Boisdale Hills	806	3,097	-	1,727	5,630
Bornish Hill	-	-	2,106	-	2,106
Country Harbour	4,903	358	2,112	829	8,202
East Bay Hills	642	1,061	162	-	1,865
French River	-	1,261	23,965	-	25,226
Hill Lake	369	395	-	113	877
Ingonish River	-	3,781	11,429	-	15,210
Isaacs Harbour River	1,269	2,721	2,167	-	6,157
Jim Campbells Barren	-	-	1,742	2,844	4,586
Masons Mountain	-	-	825	197	1,022
North River	-	1,353	4,948	27	6,328
Oban	1,167	277	-	174	1,618
Petit Lake Ruiss Noir	-	-	1,612	-	1,612
Salmon Gaspereaux	1,018	1,051	48	240	2,357
Upper Liscomb River	377	-	7,021	-	7,398
TOTAL HECTARES	**11,650**	**15,574**	**58,137**	**6,151**	**91,512**

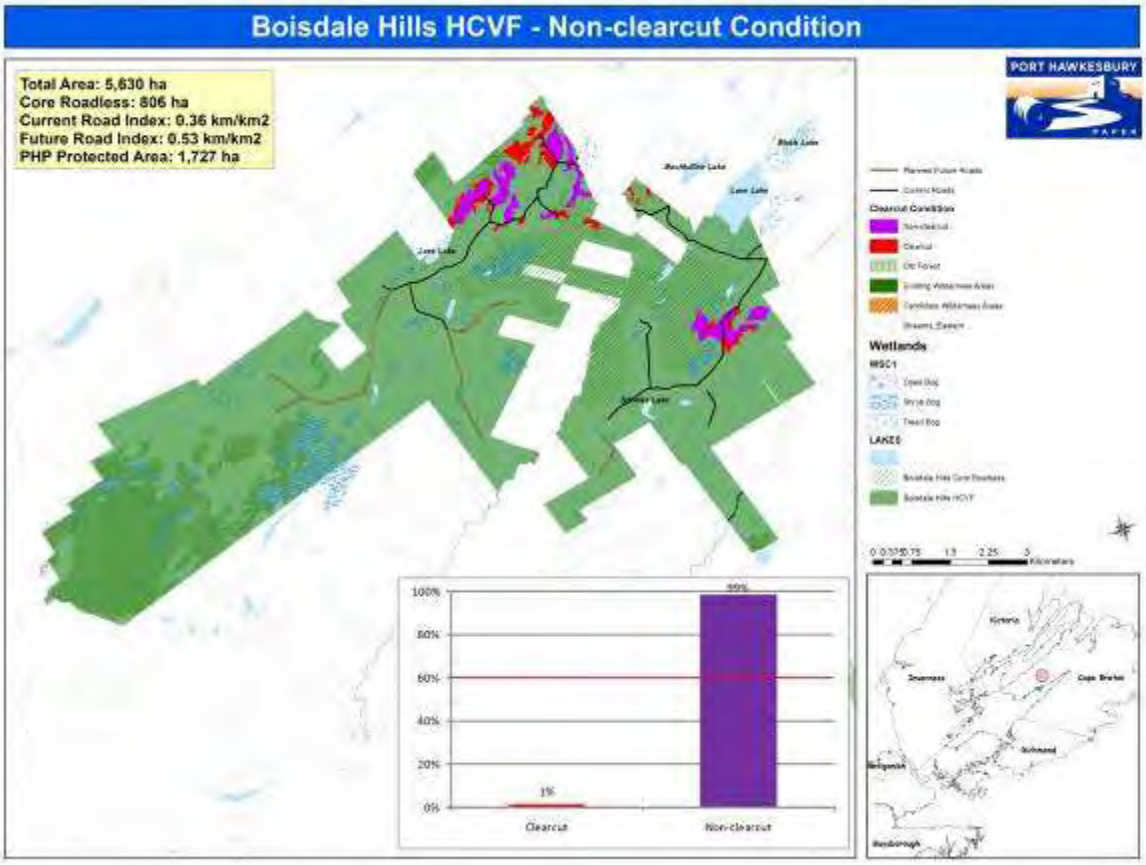
Barren Hill HCV


Barren Hill HCVF - General Overview
Total Area: 1,318 ha
Core Roadless: 1,099 ha
Current Road Index: .08 km/km2
Future Road Index: .20 km/km2
PORT HAWKESBURY
Wetlands
LAKES

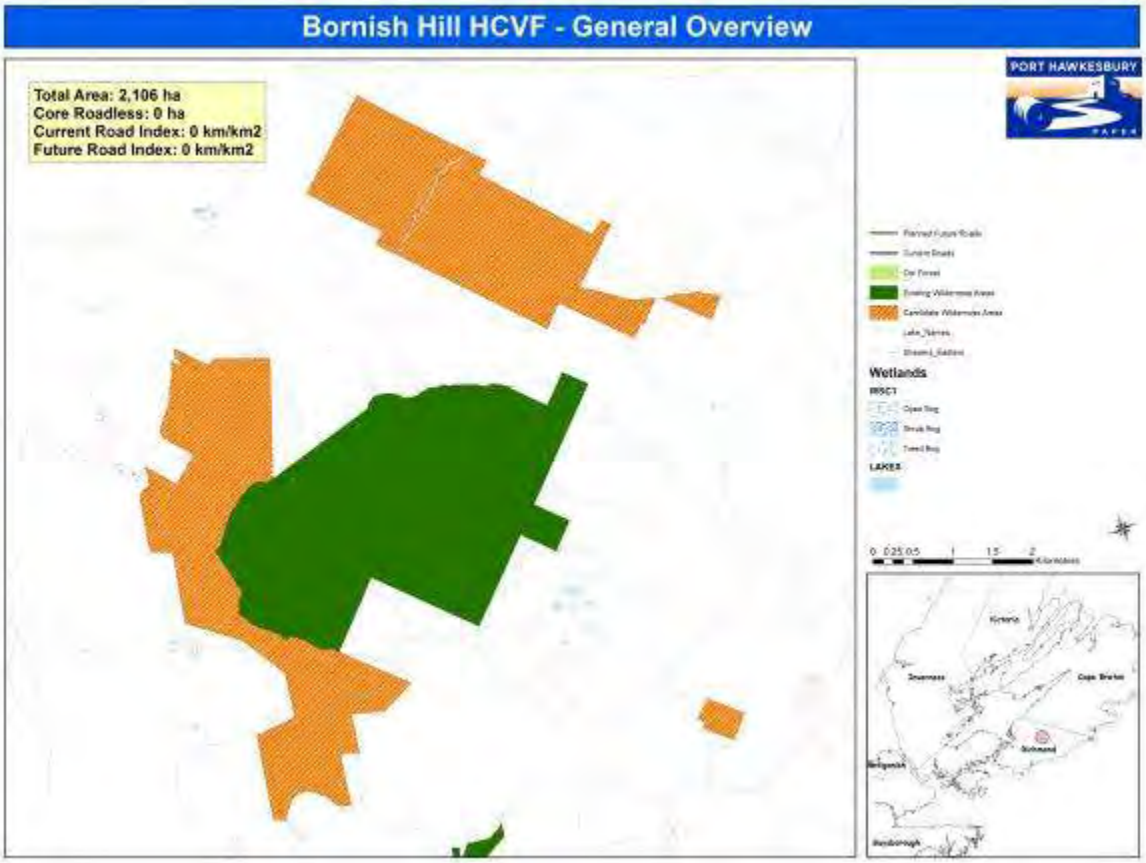

Barren Hill HCVF - Non-clearcut Condition
Total Area: 1,318 ha
Core Roadless: 1,099 ha
Current Road Index: .08 km/km2
Future Road Index: .20 km/km2
PORT HAWKESBURY
Clearcut Condition
Wetlands
LAKES
100%
80%
60%
40%
20%
0%
12%
88%
Clearcut
Non-clearcut

Boisdale Hills HCV

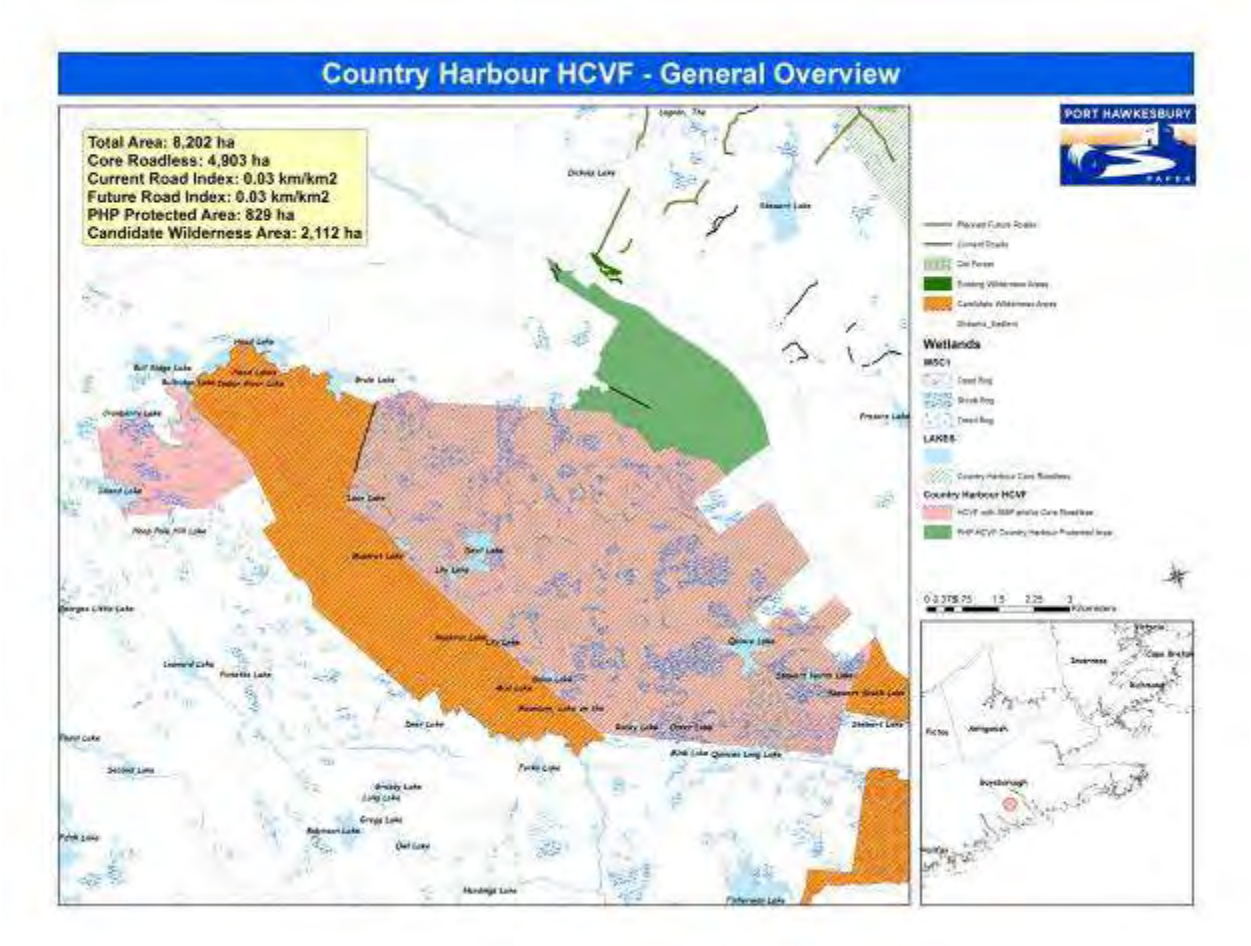


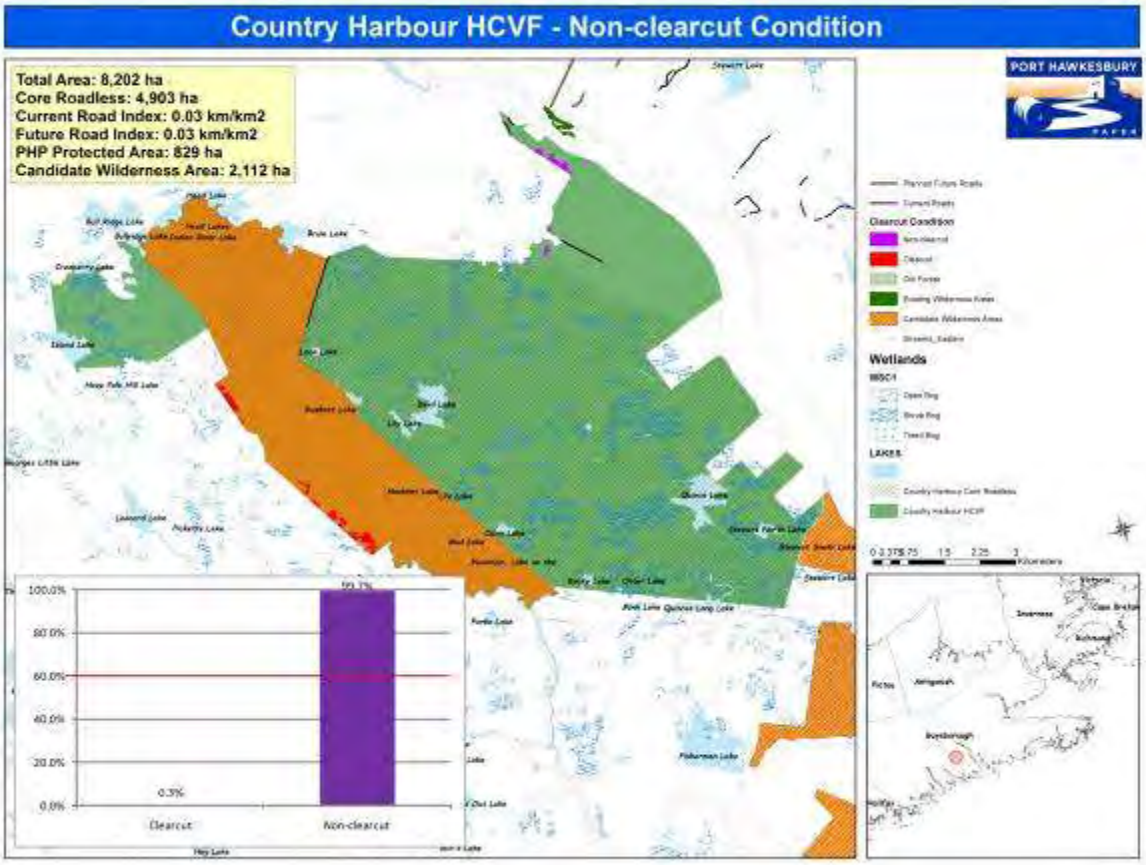

Boisdale Hills HCVF - Non-clearcut Condition
Total Area: 5,630 ha
Core Roadless: 806 ha
Current Road Index: 0.36 km/km2
Future Road Index: 0.53 km/km2
PHP Protected Area: 1,727 ha
PORT HAWKESBURY
Wetlands
LAKES
100%
80%
60%
40%
20%
0%
1%
99%
Clearcut
Non-clearcut

Bornish Hill HCV (fully protected)

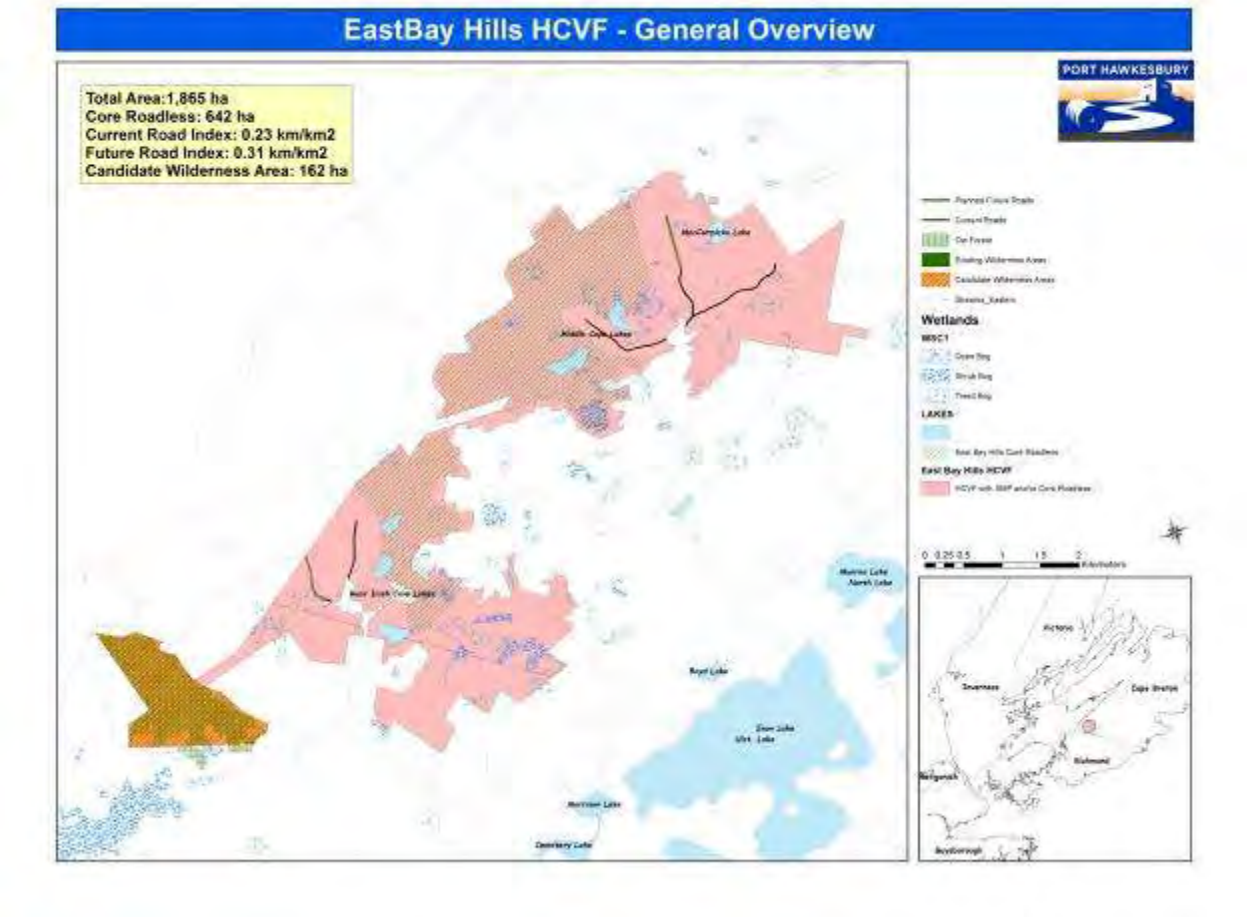


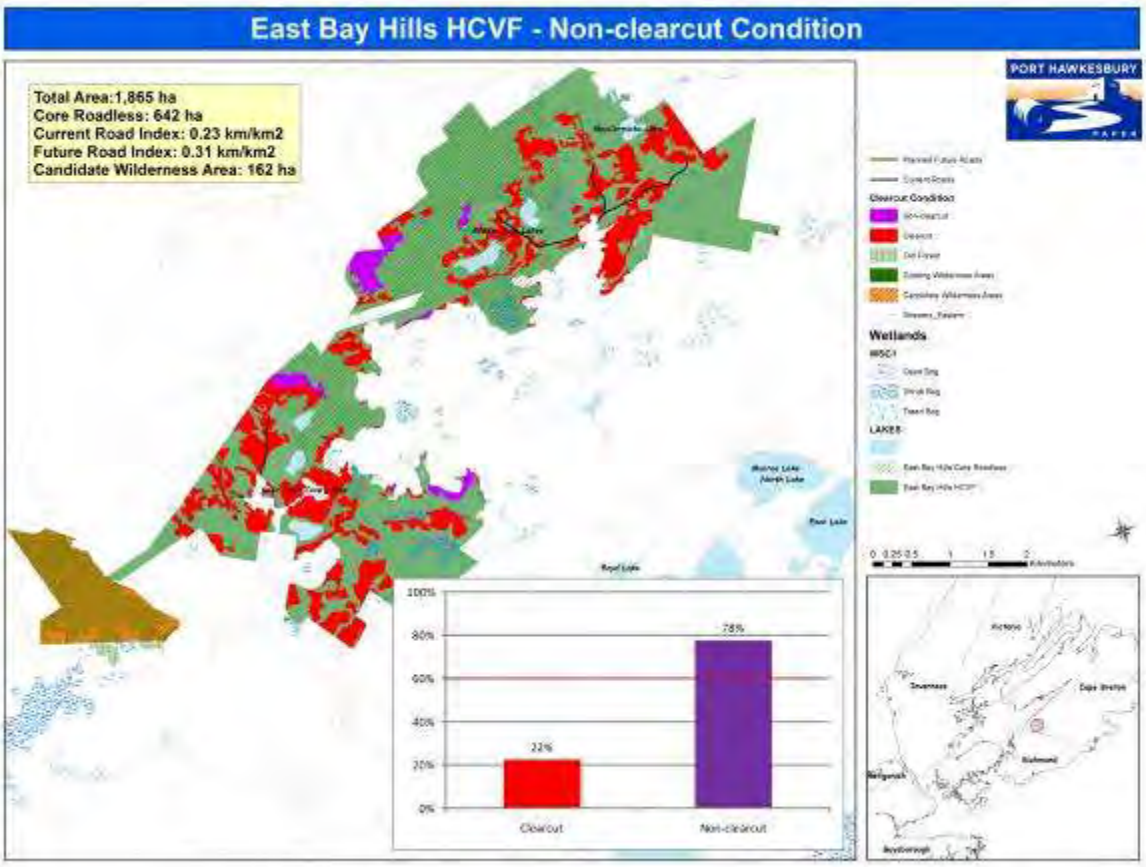
Country Harbour HCV



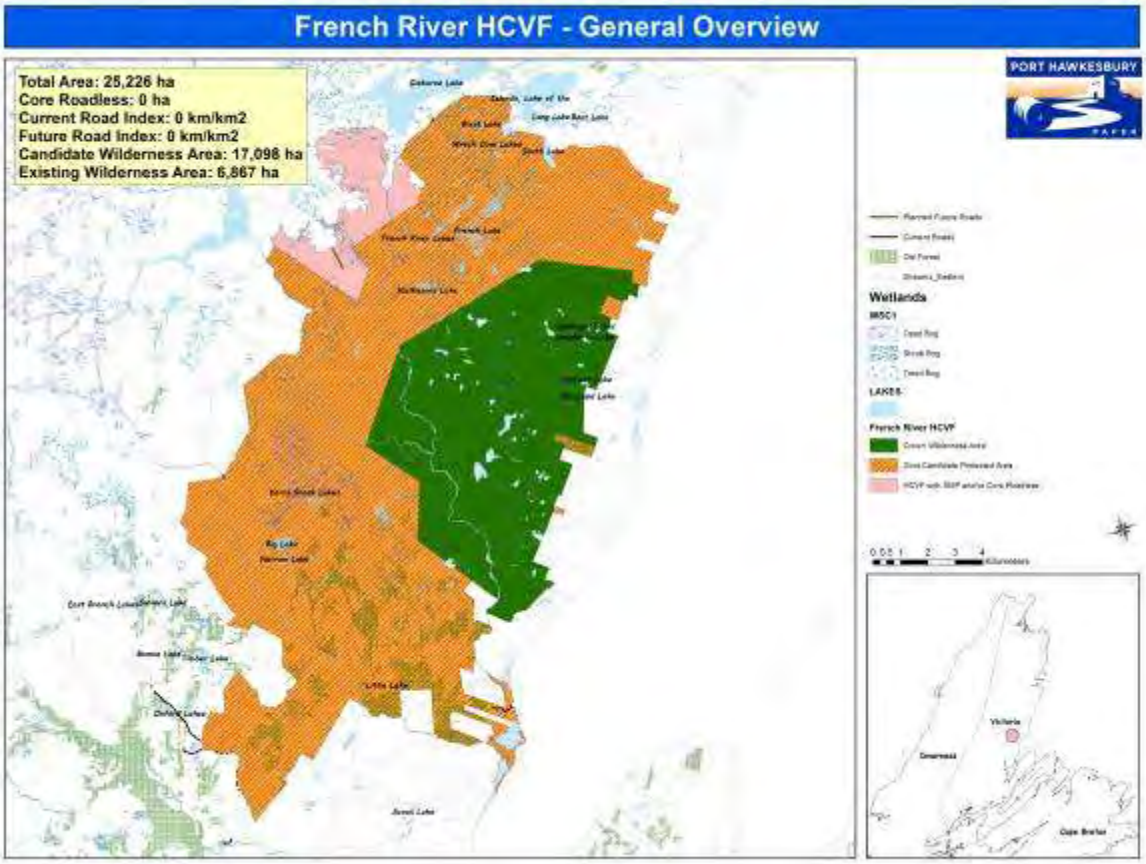

Country Harbour HCVF - Non-clearcut Condition
Total Area: 8,202 ha
Core Roadless: 4,903 ha
Current Road Index: 0.03 km/km2
Future Road Index: 0.03 km/km2
PHP Protected Area: 829 ha
Candidate Wilderness Area: 2,112 ha
PORT HAWKESBURY
Clearcut Condition
Wetlands
LAKES
100.0%
80.0%
60.0%
40.0%
20.0%
0.0%
99.7%
0.3%
Clearcut
Non-clearcut

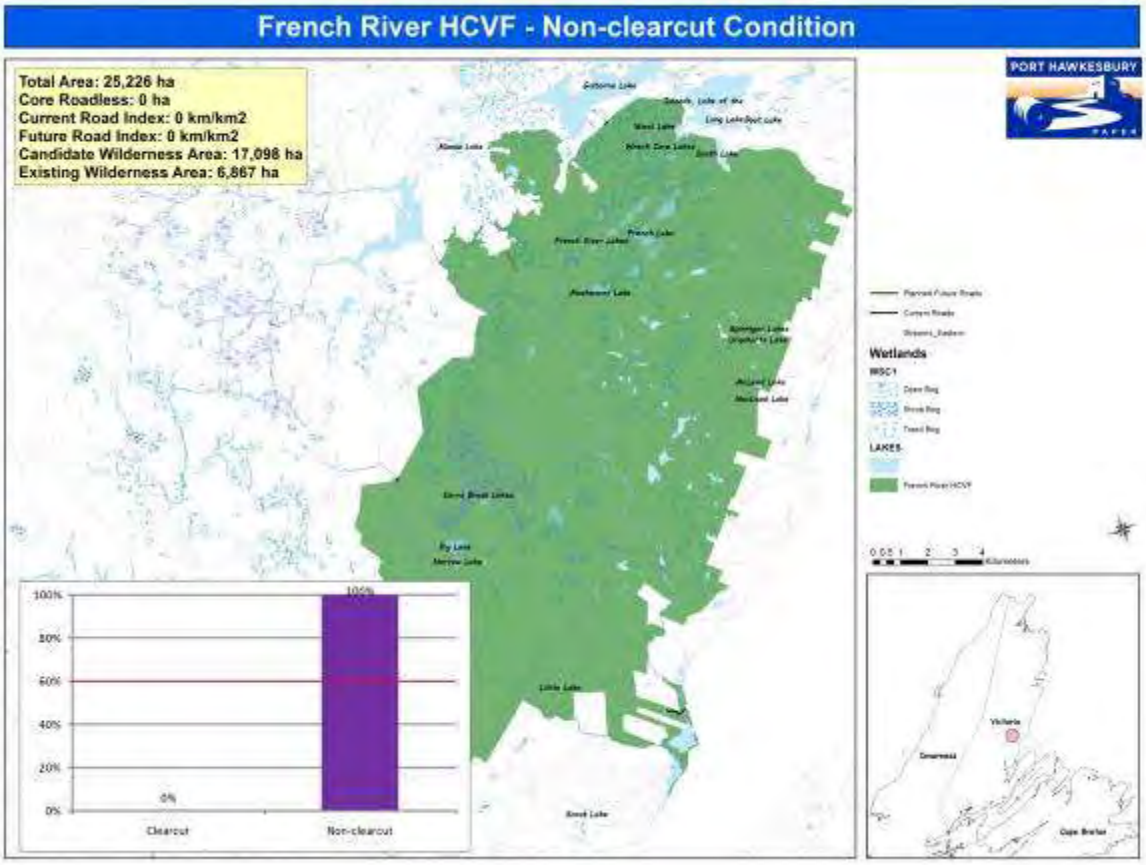
East Bay Hills HCV



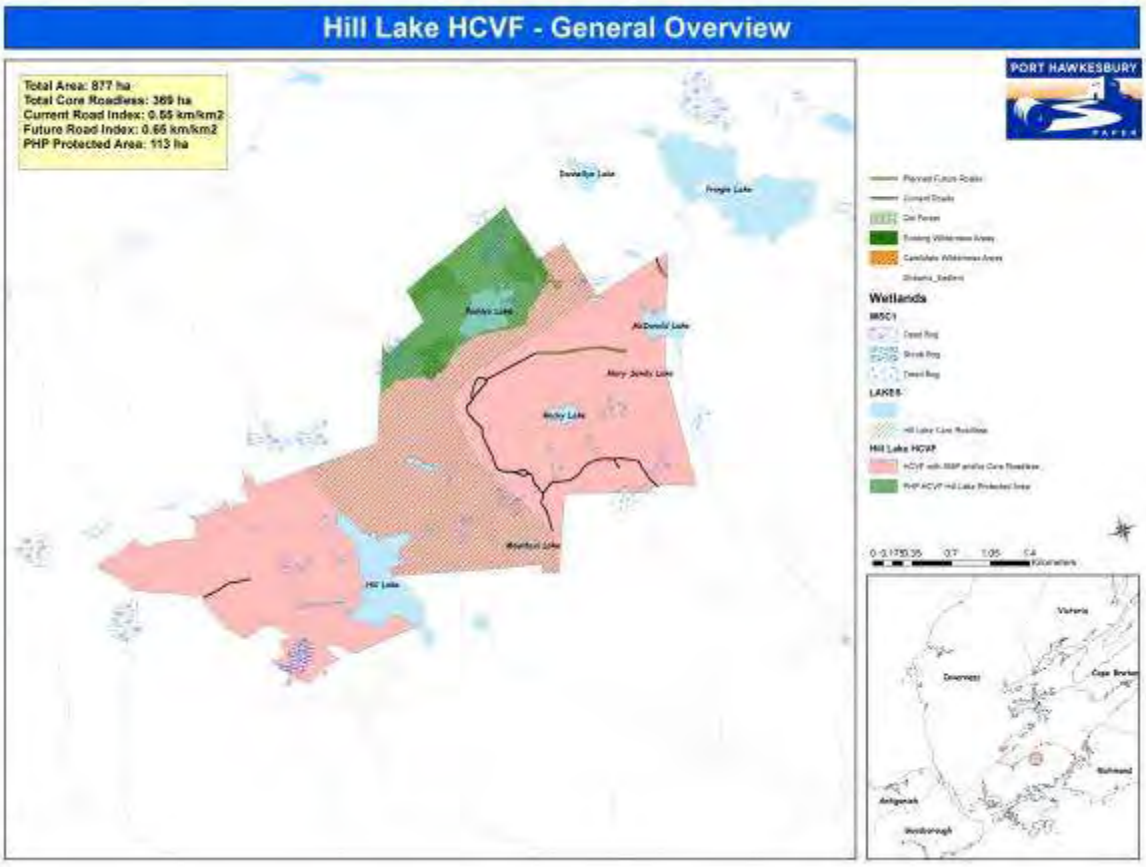

East Bay Hills HCVF - Non-clearcut Condition
Total Area:1,865 ha
Core Roadless: 642 ha
Current Road Index: 0.23 km/km2
Future Road Index: 0.31 km/km2
Candidate Wilderness Area: 162 ha
PORT HAWKESBURY
Wetlands
LAKES
100%
80%
60%
40%
20%
0%
22%
78%
Clearcut
Non-clearcut

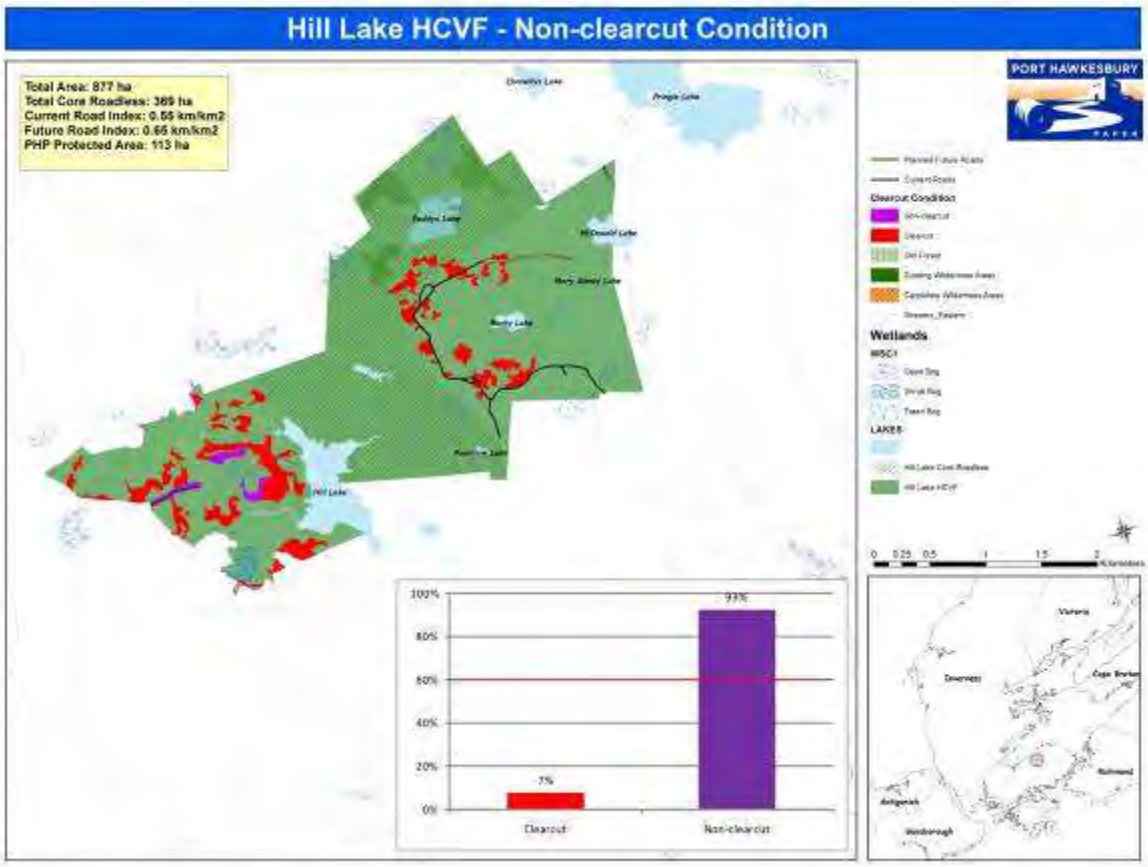
French River HCV



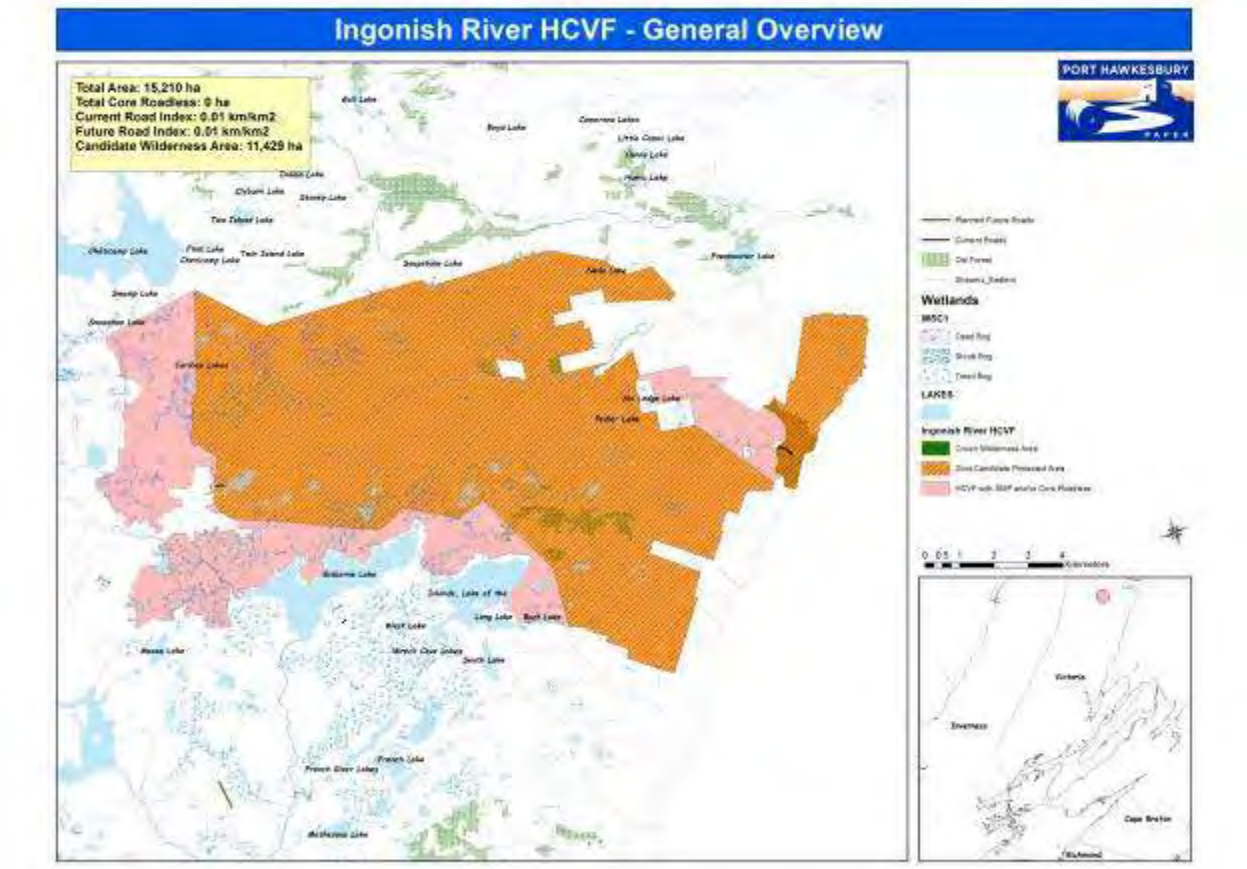

French River HCVF - Non-clearcut Condition
Total Area: 25,226 ha
Core Roadless: 0 ha
Current Road Index: 0 km/km2
Future Road Index: 0 km/km2
Candidate Wilderness Area: 17,098 ha
Existing Wilderness Area: 6,867 ha
PORT HAWKESBURY
Wetlands
WSC1
LAKES
100%
80%
60%
40%
20%
0%
0%
100%
Clearcut
Non-clearcut

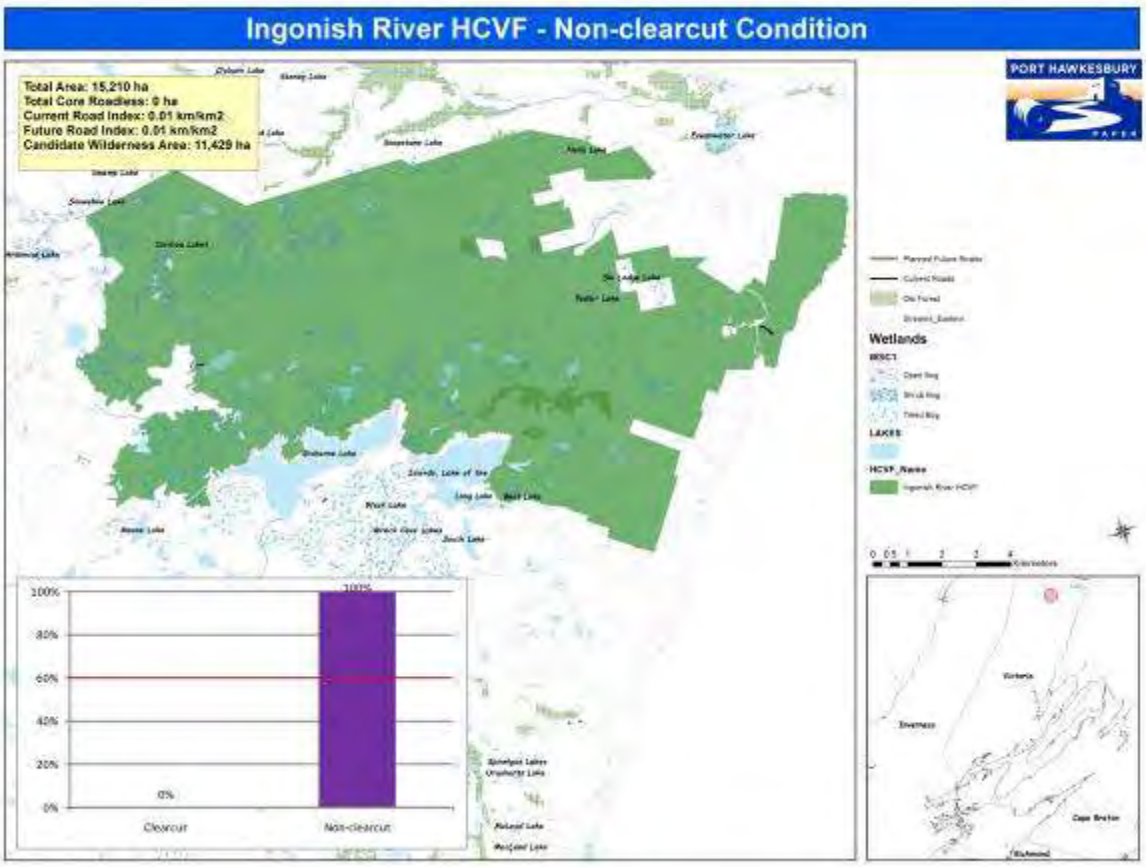
Hill Lake HCV



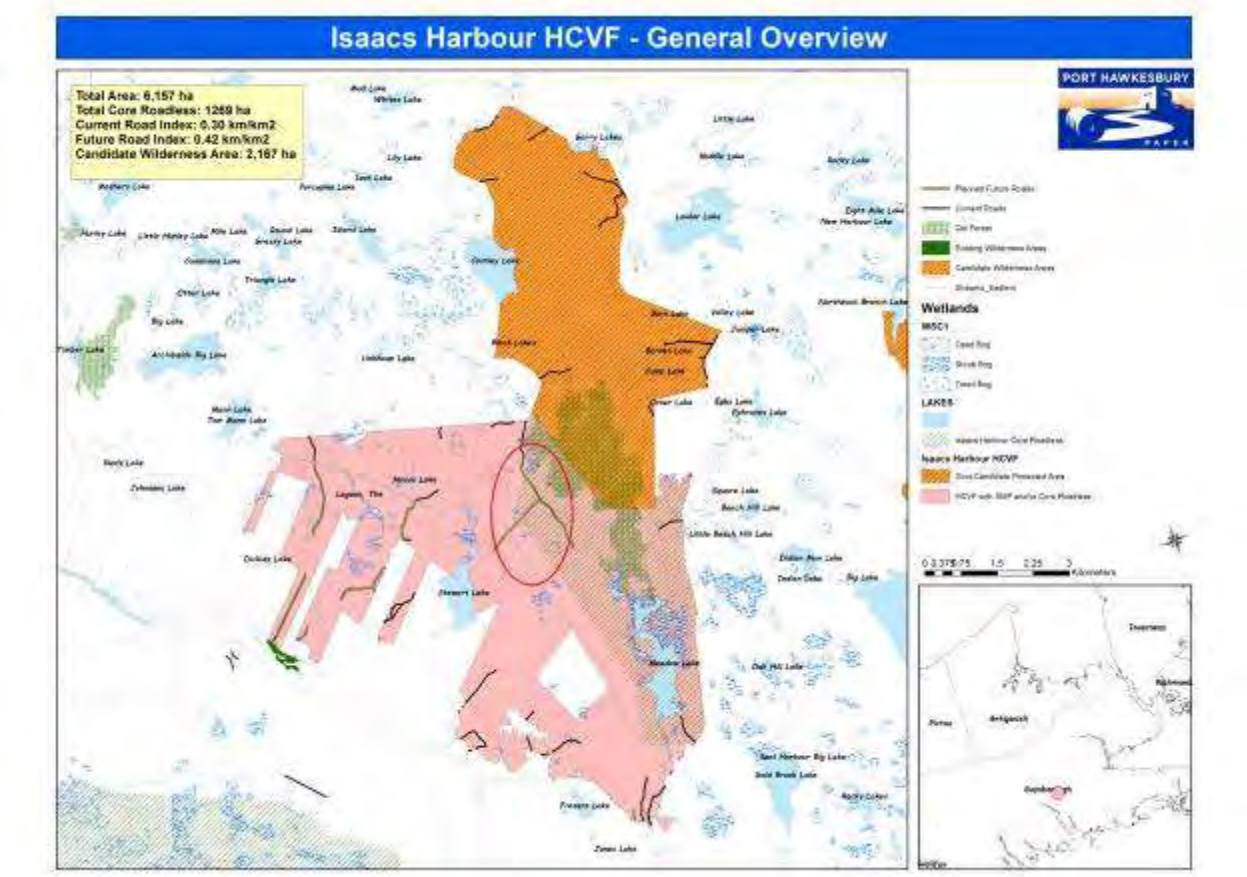

Hill Lake HCVF - Non-clearcut Condition
Total Area: 877 ha
Total Core Roadless: 389 ha
Current Road Index: 0.55 km/km2
Future Road Index: 0.66 km/km2
PHP Protected Area: 113 ha
PORT HAWKESBURY
Clearcut Condition
Wetlands
LAKES
100%
80%
60%
40%
20%
0%
7%
93%
Clearcut
Non-clearcut

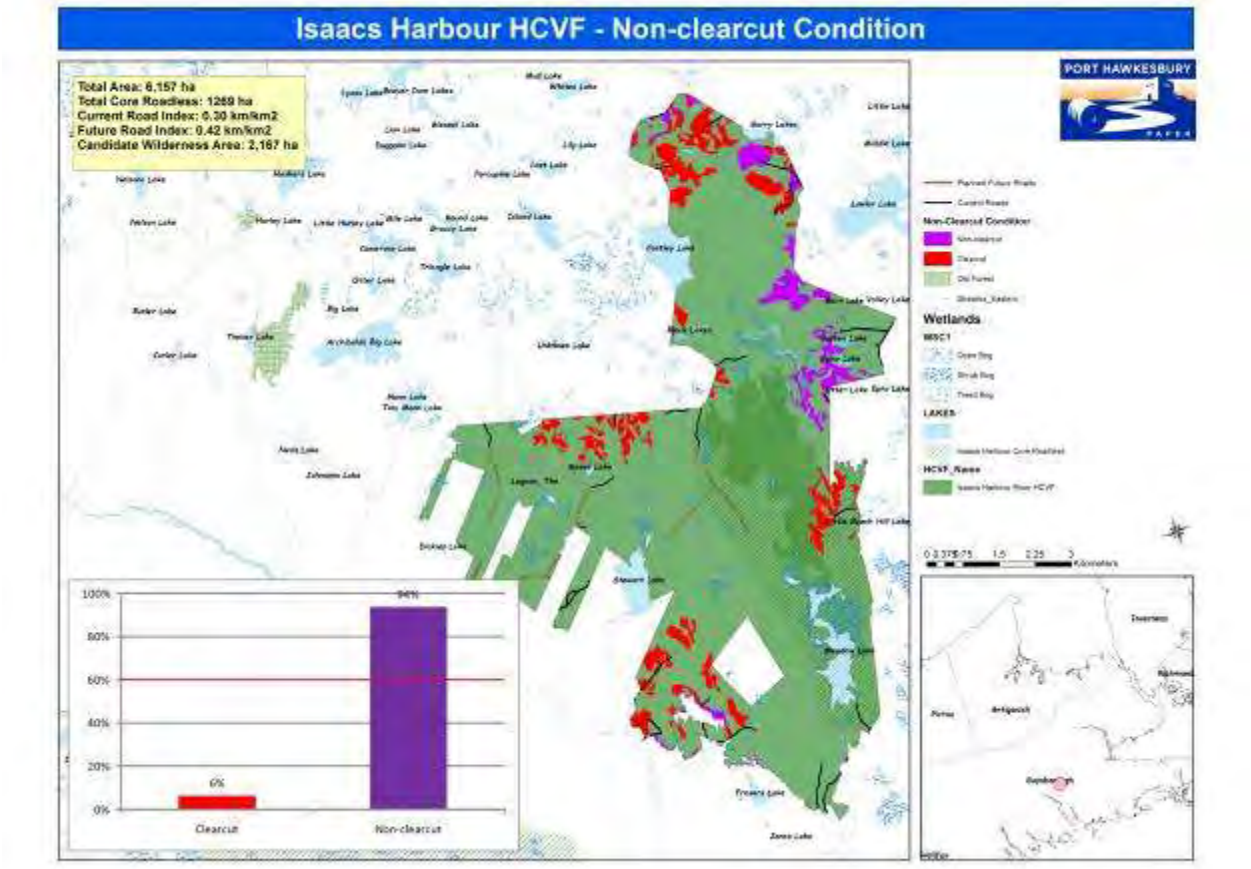
Ingonish River HCV



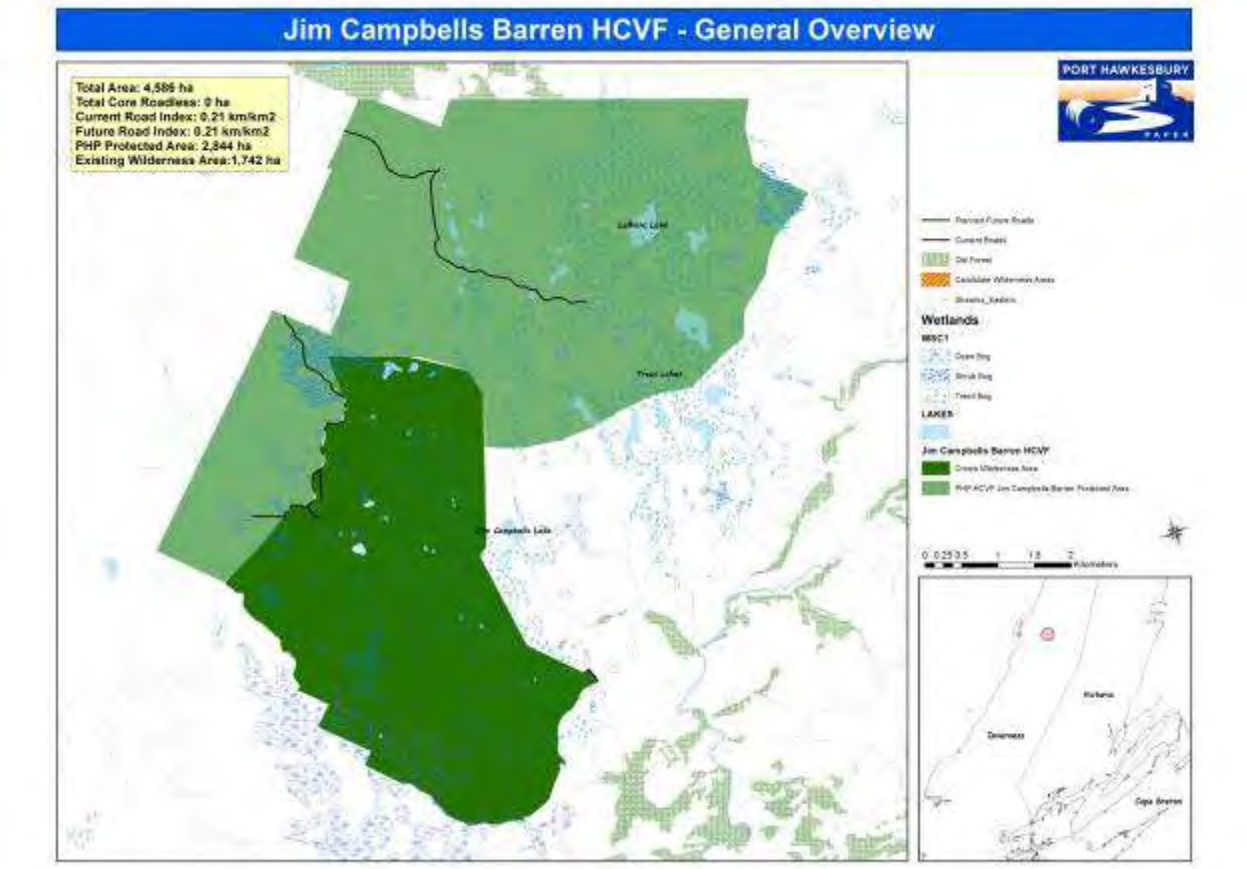

Ingonish River HCVF - Non-clearcut Condition
Total Area: 15,210 ha
Total Core Roadless: 0 ha
Current Road Index: 0.01 km/km2
Future Road Index: 0.01 km/km2
Candidate Wilderness Area: 11,429 ha
PORT HAWKESBURY
Wetlands
LAKES
100%
80%
60%
40%
20%
0%
0%
100%
Clearcut
Non-clearcut

Isaacs Harbour HCV

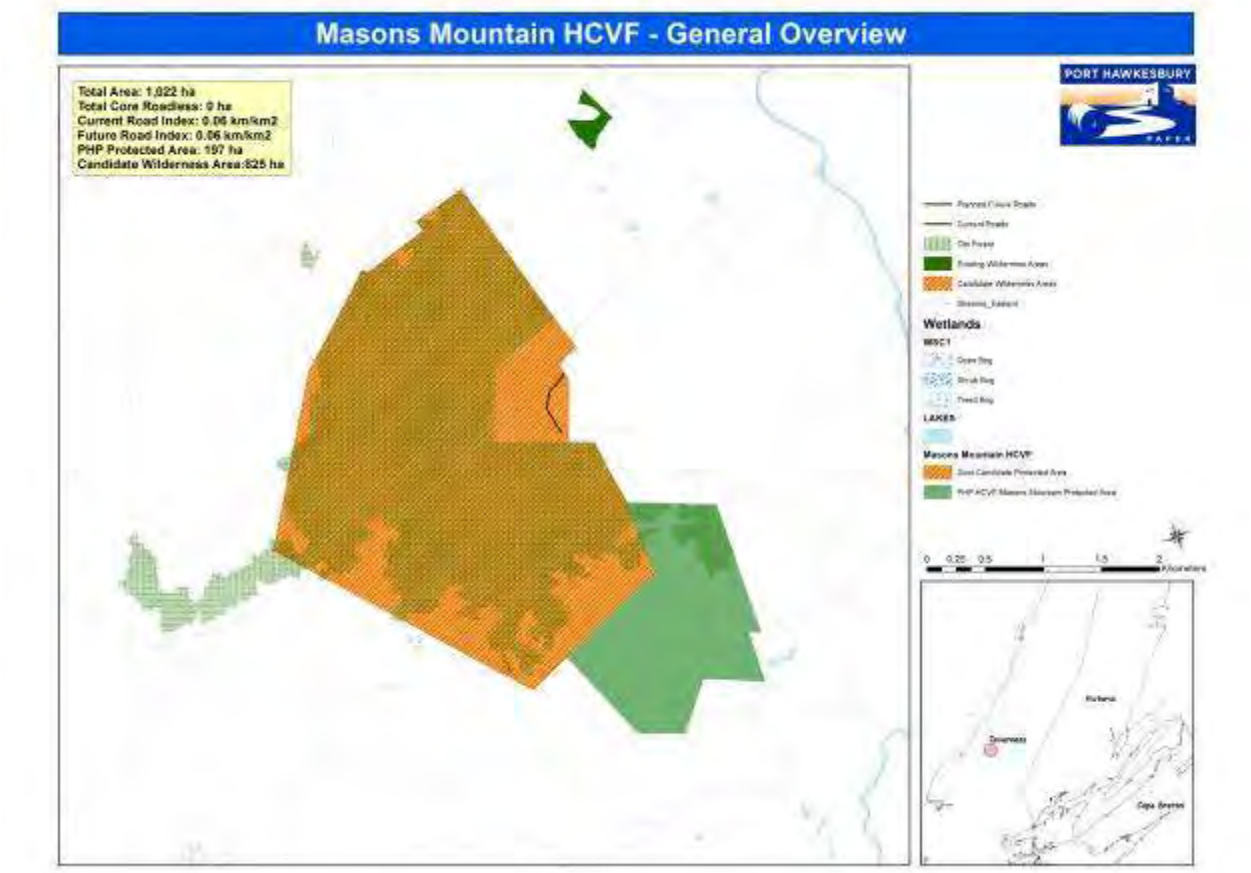



Isaacs Harbour HCVF - Non-clearcut Condition
Total Area: 6,157 ha
Total Core Roadless: 1269 ha
Current Road Index: 0.30 km/km2
Future Road Index: 0.42 km/km2
Candidate Wilderness Area: 2,167 ha
PORT HAWKESBURY
Non-Clearcut Condition
Wetlands
LAKES
100%
80%
60%
40%
20%
0%
6%
94%
Clearcut
Non-clearcut

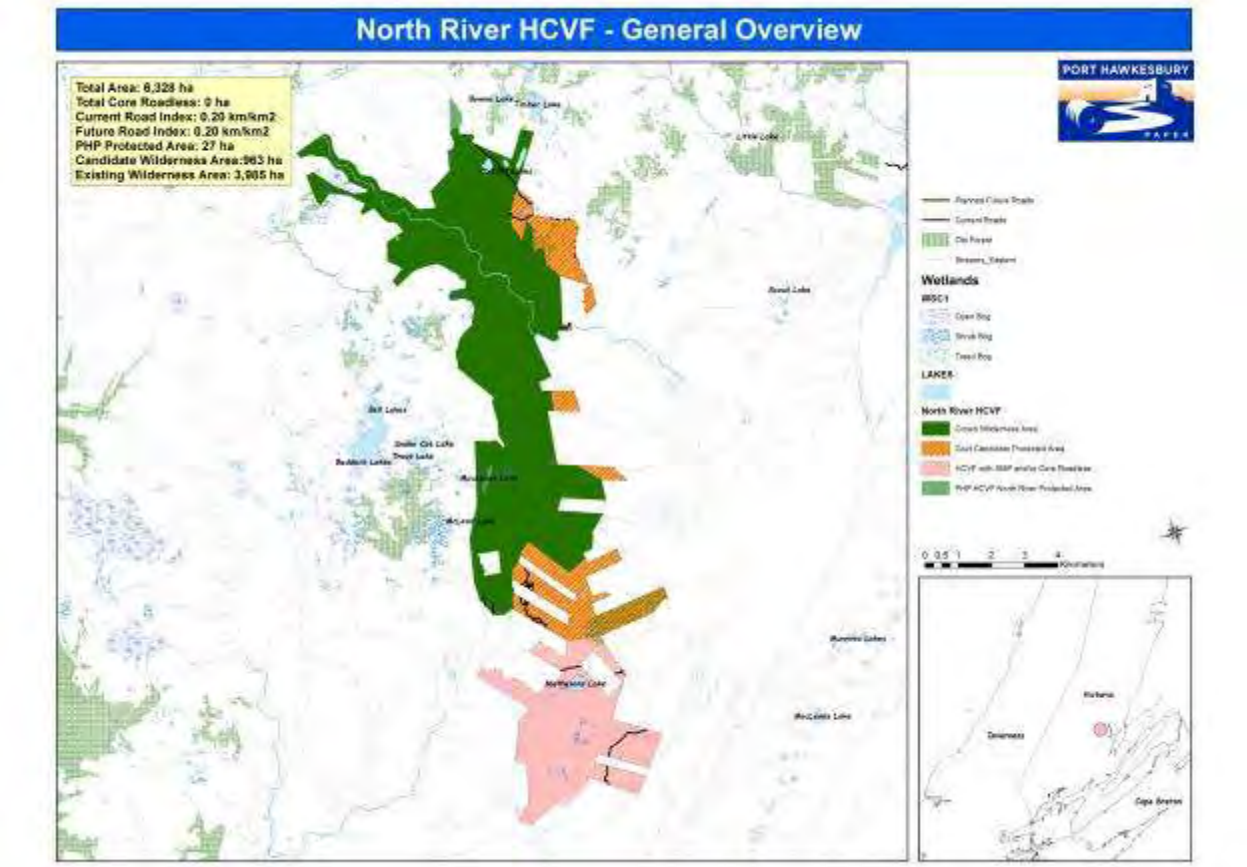
Jim Campbells Barren HCV (fully protected)

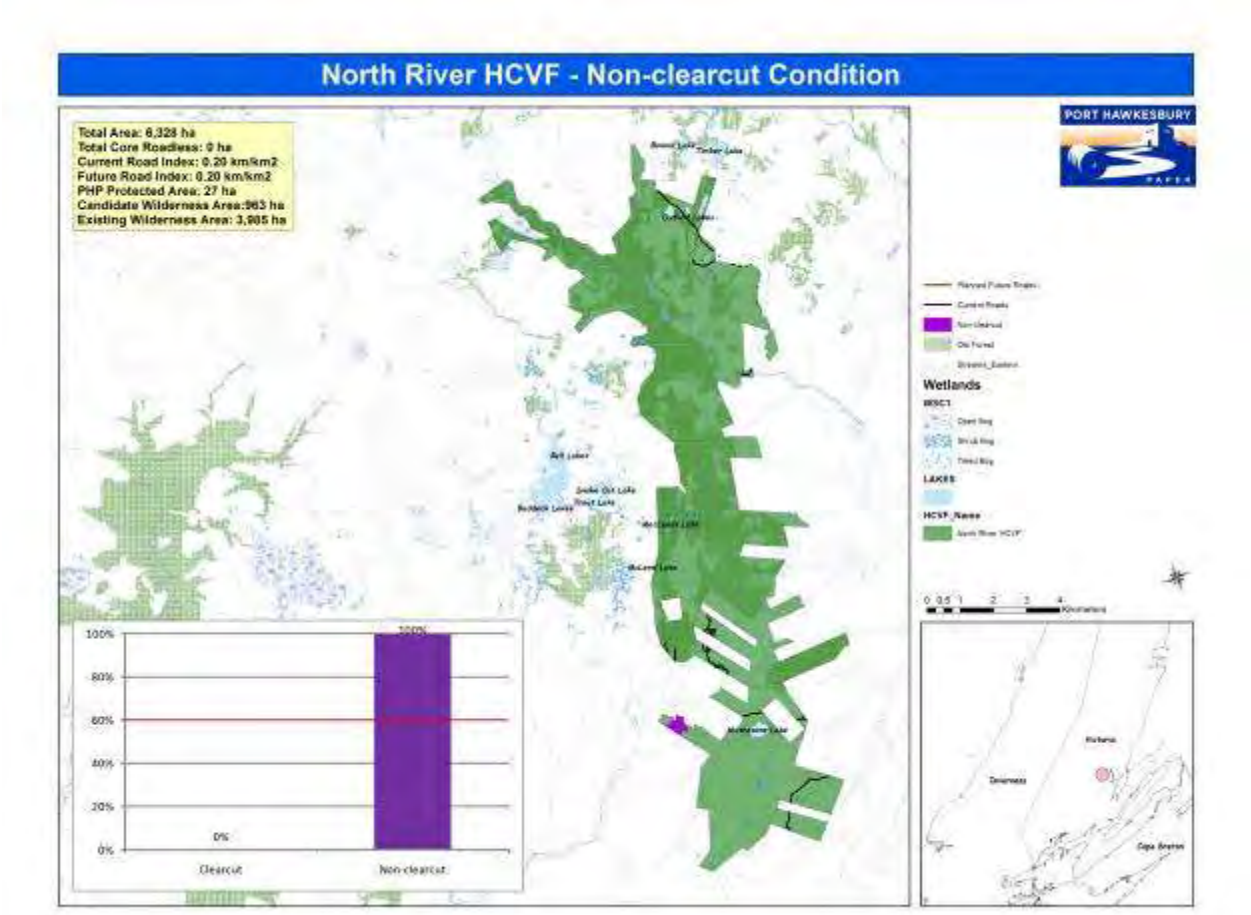


Masons Mountain HCV (fully protected)

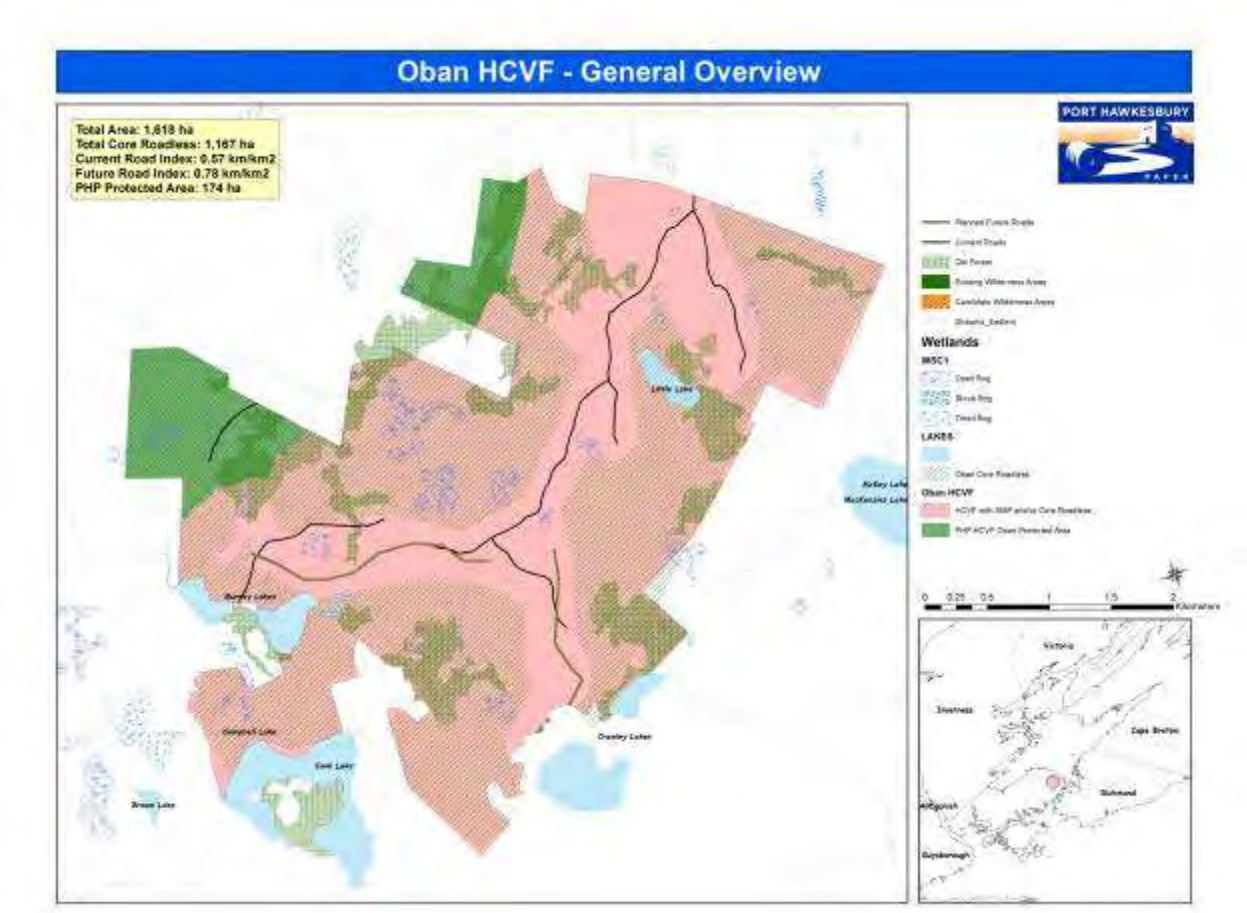


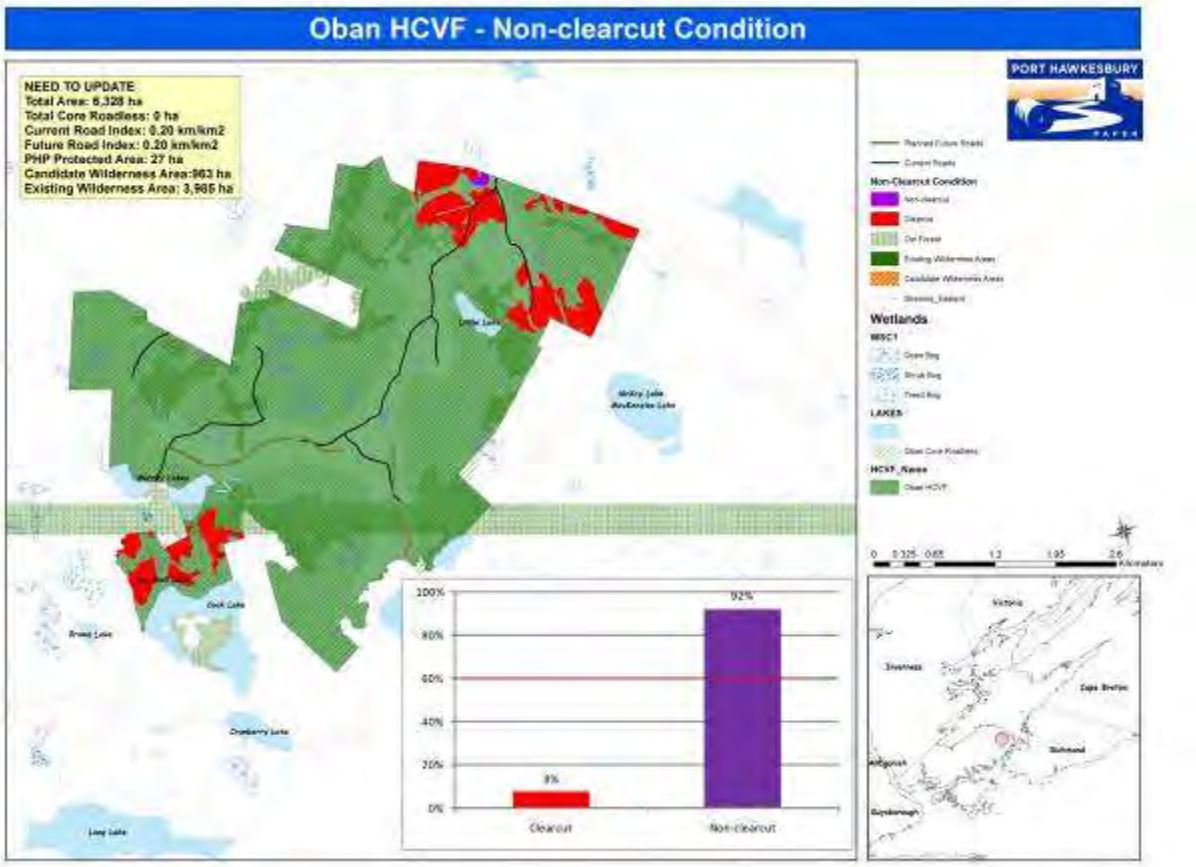
North River HCV



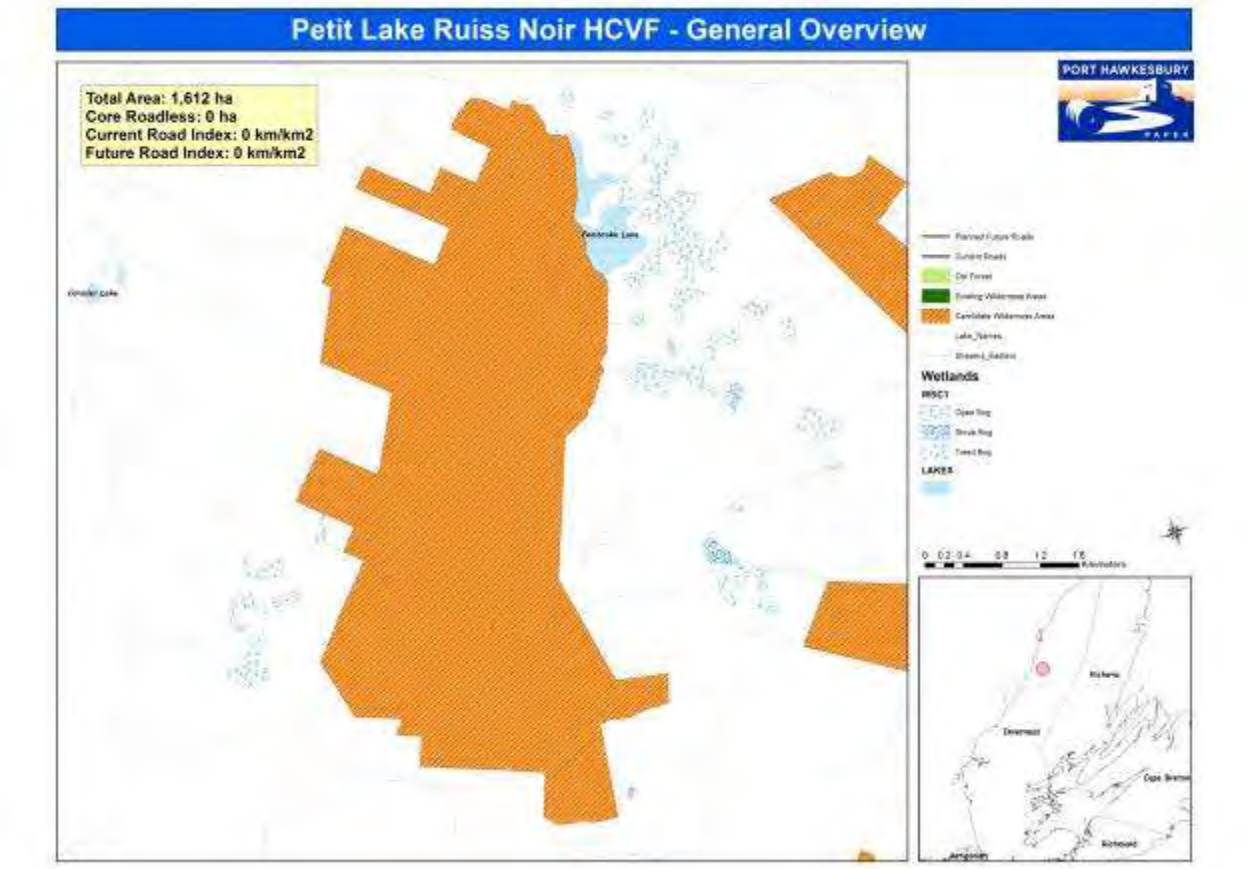

North River HCVF - Non-clearcut Condition
Total Area: 6,328 ha
Total Core Roadless: 0 ha
Current Road Index: 0.20 km/km2
Future Road Index: 0.20 km/km2
PHP Protected Area: 27 ha
Candidate Wilderness Area:963 ha
Existing Wilderness Area: 3,965 ha
PORT HAWKESBURY
Wetlands
LAKES
100%
80%
60%
40%
20%
0%
0%
Clearcut
Non-clearcut

Oban HCV

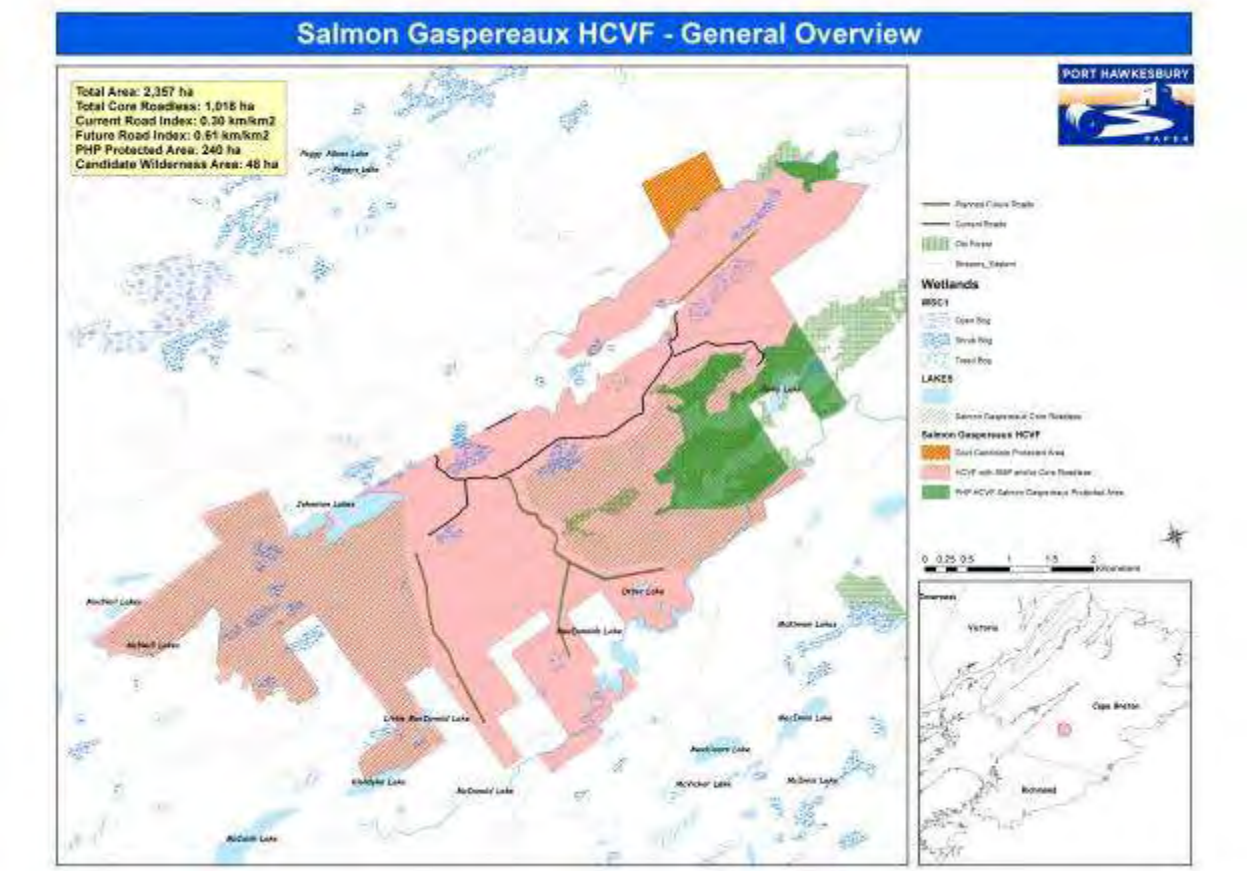

Oban HCVF - General Overview
Total Area: 1,618 ha
Total Core Roadless: 1,167 ha
Current Road Index: 0.57 km/km2
Future Road Index: 0.78 km/km2
PHP Protected Area: 174 ha
PORT HAWKESBURY
Wetlands
LAKES
Oban HCVF
Victoria
Inverness
Cape Breton
Richmond
Antigonish
Guysborough

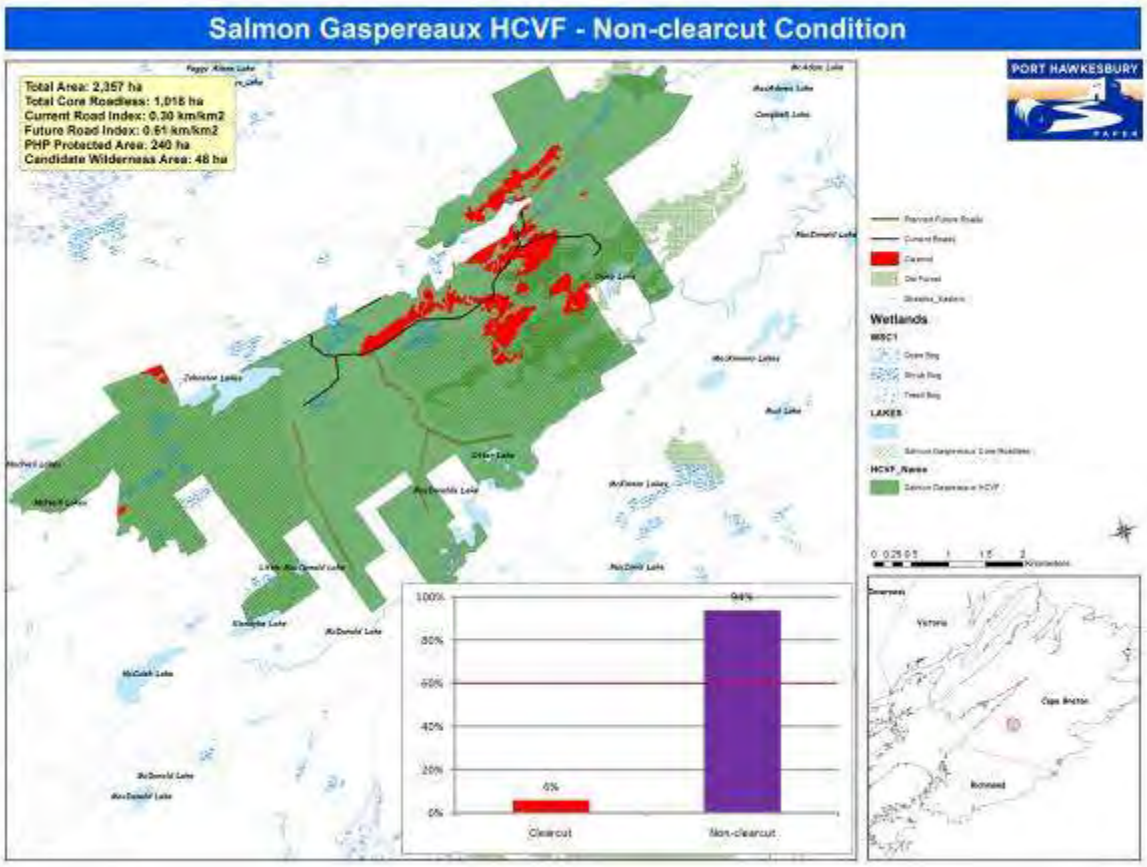

Oban HCVF - Non-clearcut Condition
NEED TO UPDATE
Total Area: 6,328 ha
Total Core Roadless: 0 ha
Current Road Index: 0.20 km/km2
Future Road Index: 0.20 km/km2
PHP Protected Area: 27 ha
Candidate Wilderness Area:963 ha
Existing Wilderness Area: 3,985 ha
PORT HAWKESBURY
Non-Clearcut Condition
Wetlands
LAKES
100%
80%
60%
40%
20%
0%
8%
92%
Clearcut
Non-clearcut

Petit Lake Ruiss Noir HCV (fully protected)

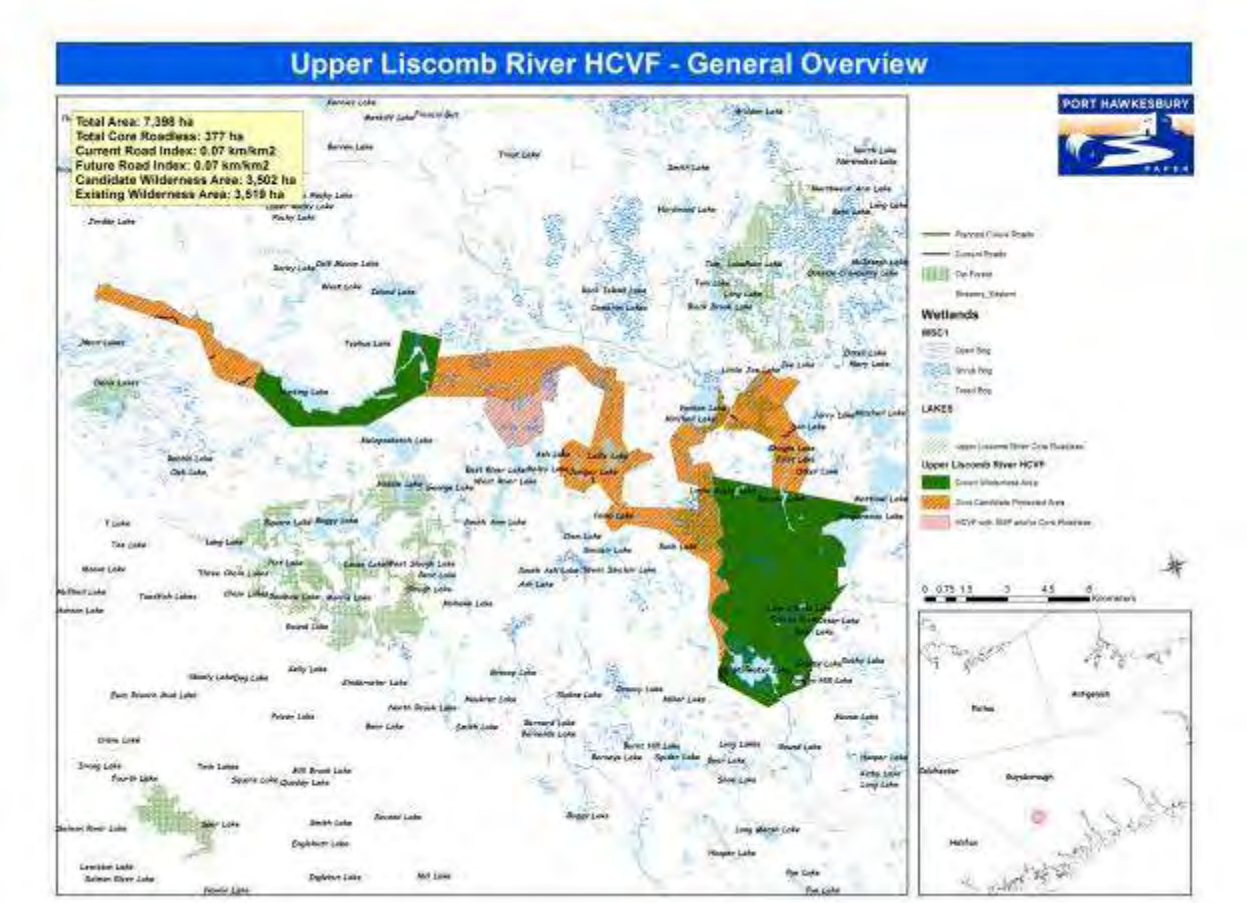


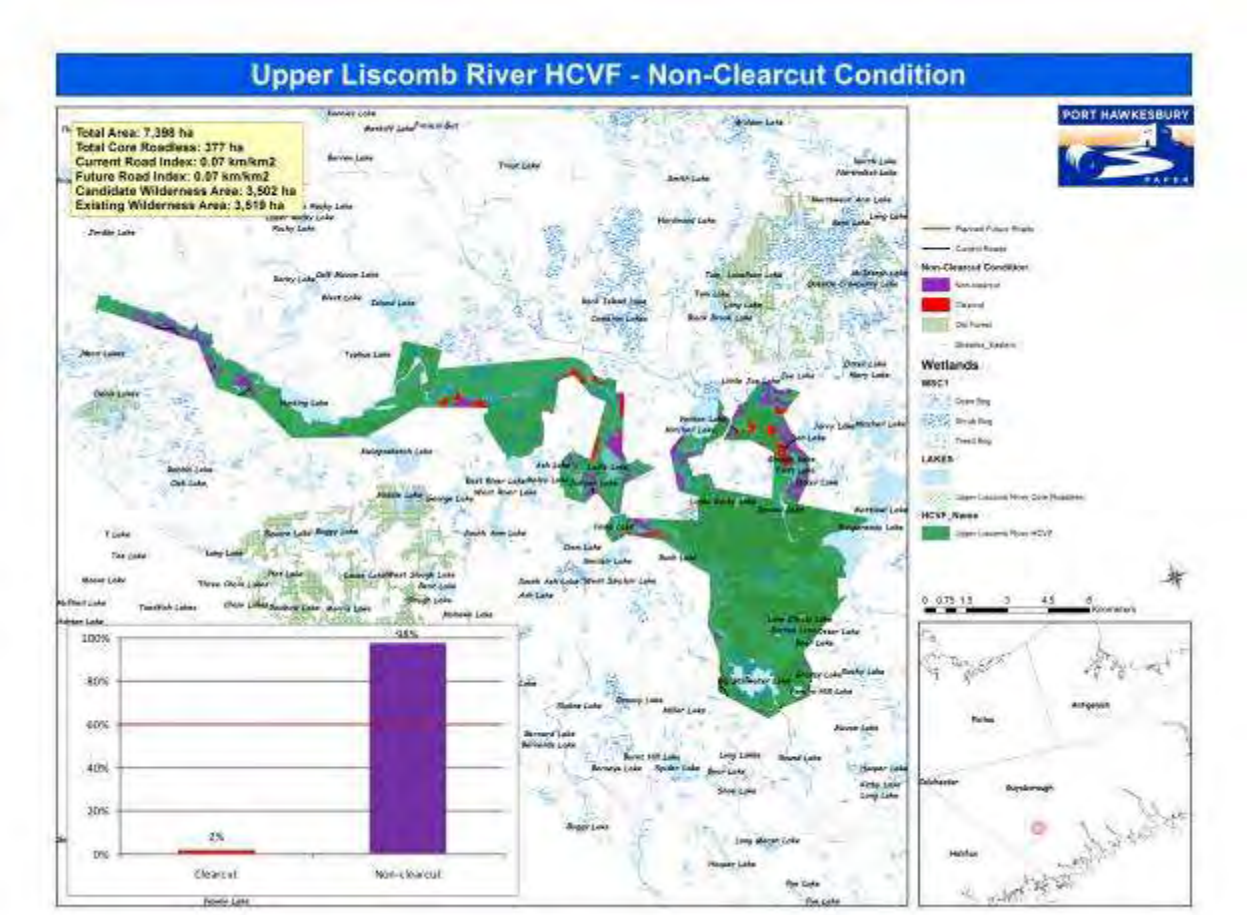
Salmon Gaspereaux HCV




Salmon Gaspereaux HCVF - Non-clearcut Condition
Total Area: 2,357 ha
Total Core Roadless: 1,018 ha
Current Road Index: 0.30 km/km2
Future Road Index: 0.61 km/km2
PHP Protected Area: 240 ha
Candidate Wilderness Area: 48 ha
PORT HAWKESBURY
Wetlands
LAKES
100%
80%
60%
40%
20%
0%
6%
94%
Clearcut
Non-clearcut

Upper Liscomb River HCV

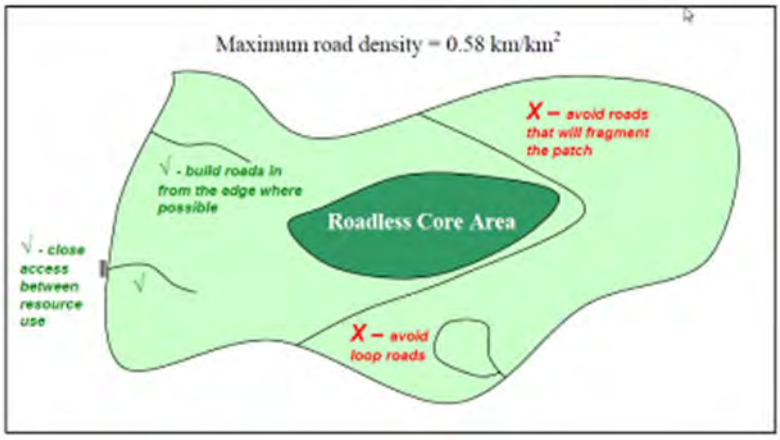




Management Approach for Large Landscape and Remnant Patch HCV's

The HCV review committee finalized a list of several management strategies at the landscape scale as well as the forest stand scale for the large landscape and remnant patch HCV's.

No management activities (harvest, silviculture, roads) permitted in legal (and pending) protected areas and PHP administrative protected areas
CORE ROADLESS AND SPECIAL MANAGEMENT AREAS
No new roads in Core Roadless areas
For HCV area outside core roadless, follow road design objectives as shown below. Road Index value at HCV level not to exceed 0.58 km/km2. If feasible and where necessary, block off access to reduce road travel.



Use the provincial Forest Ecosystem Classification Guide to identify ecosite level prescriptions that: • Promote ecosite patches by combining stands through treatment • Employ 'extensive' management practices that support: - natural regeneration - longer rotations with consideration of natural disturbance processes - tree species diversity consistent with the vegetation type, while promoting those that support long-term resilience (i.e. best options for future)
No full-tree logging
Reduce road length by increasing average forwarding distance targets by 20% (from 250 m to 300 m)
Bridge construction may be temporary and removed as practical
Retain minimum 60% area in non-clearcut condition (at the HCV level). Non-clearcut defined as forest stand greater than 10 years of age.
No FSC plantations / Intensive management
No planting of exotic species
Acadian Forest Restoration (considering N.S. Forest Code; FSC)
Management will align with natural disturbance regimes
Application of Forest Ecosystem Classification to identify appropriate treatments
Appropriate forest covertype management: Use of hardwood management keys
Appropriate forest covertype management: Use of mixedwood management keys
Natural regeneration where appropriate
Appropriate use of PHP's 12 different harvest techniques (CC, PC, SW, ST, Single, Group, Patch, CT, OR, CTR, RS, SC)
Species at Risk Recovery Strategy/SMP Implementation
No herbicides
Steep Slope Exclusion
Leave patches (e.g. active eagle/hawk nest sites, inoperable areas, vernal pools, DNR requests during approval process)

7.0 CATEGORY 3: RARE, THREATENED OR ENDANGERED ECOSYSTEMS

Category 3: Ecosystems and habitats. Rare, threatened, or endangered ecosystems, habitats or refugia.

Question 8.
Does the forest contain naturally rare ecosystem types?

Rationale

Ecosystem types that are naturally rare on the landscape often contain important biodiversity, provide critical natural ecosystem services, and/or contain geographically restricted species often with narrow ecological niches. Quite often, these ecosystem-types are disproportionately significant for their size and many are vulnerable, or have been made rarer, by anthropogenic influences.

Methods

Rare ecosystem types were identified and mapped for the HCV assessment using NSE's significant ecosites database and the portfolio of critical occurrences from the assessment of the Northern Appalachian / Acadian Ecoregion by the Nature Conservancy.

Significant ecosites (NSE)

NSE has compiled a list of rare ecosystem-types within the province (Table 7). Currently, forty different rare ecosystem-types are included in the significant ecosite database, including examples of rare forest types, significant wetlands, coastal areas, aquatic and riverine systems, and a number of terrestrial non-forest ecosystems. Spatial distributions were generated for the database from a combination of original GIS analyses and aerial photograph interpretation, with some previous ground-truthing where possible.

All significant ecosite types included in this list occupy near, or less than, one percent of the total landmass of Nova Scotia. Some are known from only a few locations in the province or contain only a few total hectares province-wide. The significant ecosite database does not differentiate between ecosystem types that are naturally rare within the province, or those rare due to anthropogenic influences. In many cases, there is overlap between the two, where naturally rare ecosystem-types are made rarer due to ongoing anthropogenic influences.

Forest

Rare forested ecosystems include mature stands of natural jack pine, natural red pine forest, hemlock forest, beech forest, red maple floodplains, hemlock floodplains, forested floodplains, coastal tolerant hardwood forest, mountain cove ecosystems, calcareous- and karst-dominated forests, and forested dunes.

Terrestrial non-forest

Rare terrestrial non-forest ecosystems include talus slopes, karst shrublands, cliff ecosystems, coastal barrens, inland barrens, highland barrens, and certain types of wetland-barren ecosystem complexes.

Wetlands

Rare wetland ecosystems include alkaline bogs, alkaline fens, vernal ponds, salt marshes, coastal bogs, and coastal fens. For Crown lands, the NSE database also includes the best representative examples of certain wetland types within the province, as well as wetland complexes that are rare or uncommon in Nova Scotia.

Coastal

Rare coastal ecosystems within the NSE database include beach and dune systems, various types of coastal wetlands (e.g. coastal bogs, coastal fens, salt marshes), coastal barrens, erosional seabluffs, offshore islands, coastal tolerant hardwood forest, forested dunes, and type sequence examples of estuaries and lagoons.

Portfolio of critical occurrences: NAAE

The Nature Conservancy has completed a region wide analysis of the NAAE, which includes the Canadian Maritime Provinces, the Gaspé region of Quebec, and portions of the New England States. As part of this conservation assessment, a portfolio of critical occurrences was identified which includes a number of rare ecosystem-types of great importance to conservation within the ecoregion. This data was analyzed over a four-year period by a team of experts assembled by the Nature Conservancy.

For the HCV assessment, the spatial distributions of all 'critical' and 'critical protected' wetland, summit, slope, floodplain, and ravine areas from the portfolio of critical occurrences were included in the analysis of rare ecosystem-types. These features are regionally-significant within the ecozone.

Results

Table 7: NSE significant ecosites

Rare ecosystem-type	Total area in Nova Scotia (ha)	Proportion of Nova Scotia (%)	Total area in PHP lands (ha)	Proportion of provincial occurrence on PHP lands (%)
Alkaline bog	11850.1	0.22	379.9	3.21
Alkaline fen	3513.7	0.06	130.4	3.71
Beach/dune	5806.4	0.11	125.0	2.15
Beech forest	1065.4	0.02	9.7	0.91
Calcareous forest	12423.6	0.23	1443.1	11.62
Cliff*	15.8	0.00	15.8	99.98
Coastal tolerant hardwood	1123.1	0.02	29.0	2.58
Coastal barren	63377.9	1.15	11347.4	17.90
Coastal open bog	16195.9	0.29	2029.4	12.53

Coastal open fen	2620.3	0.05	534.3	20.39
Coastal shrub bog	18264.3	0.33	3313.7	18.14
Coastal shrub fen	4231.2	0.08	533.6	12.61
Coastal treed bog	14101.1	0.26	1968.9	13.96
Coastal treed fen	2448.0	0.04	700.0	28.59
Erosional seabluff	297.8	0.01	2.0	0.66
Estuarine flat	38758.9	0.70	0.1	0.00
Estuary complex*	18.7	0.00	16.0	85.19
Fen/bog complex*	20909.2	0.38	3392.5	16.22
Floodplain forest*	196.0	0.00	59.1	30.17
Hemlock floodplain	238.6	0.00	19.3	8.11
Hemlock forest	6527.0	0.12	87.0	1.33
Highland barren	15724.2	0.29	3979.4	25.31
Inland barren	48500.9	0.88	10815.9	22.30
Inland bog/barren complex*	80.1	0.00	80.1	100.00
Karst conifer forest	11978.8	0.22	633.6	5.29
Karst hardwood forest	11622.2	0.21	995.0	8.56
Karst shrubland	1264.6	0.02	27.6	2.18
Lagoon	8119.9	0.15	209.1	2.57
Lake island	5612.1	0.10	46.7	0.83
Mountain cove	76.9	0.00	38.7	50.28
Offshore Island	24312.9	0.44	124.4	0.51
Oxbow lake	140.2	0.00	0.4	0.30
Red pine forest	2023.5	0.04	128.8	6.37
Red maple floodplain*	56.7	0.00	0.7	1.18
Salt Marsh	15482.4	0.28	15.6	0.10
Shrub fen complex*	80.0	0.00	62.3	77.83
Sugar maple floodplain	4367.1	0.08	528.8	12.11
Talus slope	946.1	0.02	160.8	17.00
Vernal pond	443.9	0.01	2.6	0.58
Forested dunes	3321.8	0.06	31.9	0.96

*representative example

Table 8: NAAE-CA ‘critical’ and ‘critical protected’ occurrences

NAAE-CA critical occurrence	Total area in Nova Scotia (ha)	Proportion of Nova Scotia (%)	Total area in PHP lands (ha)	Proportion of provincial occurrence on PHP lands (%)
Floodplain (critical)	77720.81	1.41	4753.81	6.12
Floodplain (critical protected)	4132.39	0.08	0.03	0.001
Ravine (critical)	0	0	0	0
Ravine (critical protected)	0	0	0	0
Slope (critical)	835.82	0.02	230.64	27.59
Slope (critical protected)	1148.60	0.02	67.02	5.83
Summit (critical)	2294.11	0.04	350.13	15.26
Summit (critical protected)	1672.28	0.03	4.20	0.25
Wetlands (critical)	16143.81	0.29	1323.80	8.20
Wetlands (critical protected)	15600.96	0.28	773.91	4.96

HCV Decision:

All significant ecosites from the NSE database, and all sites from the portfolio of critical occurrences from the Nature Conservancy's assessment of the NAAE are considered HCVs.

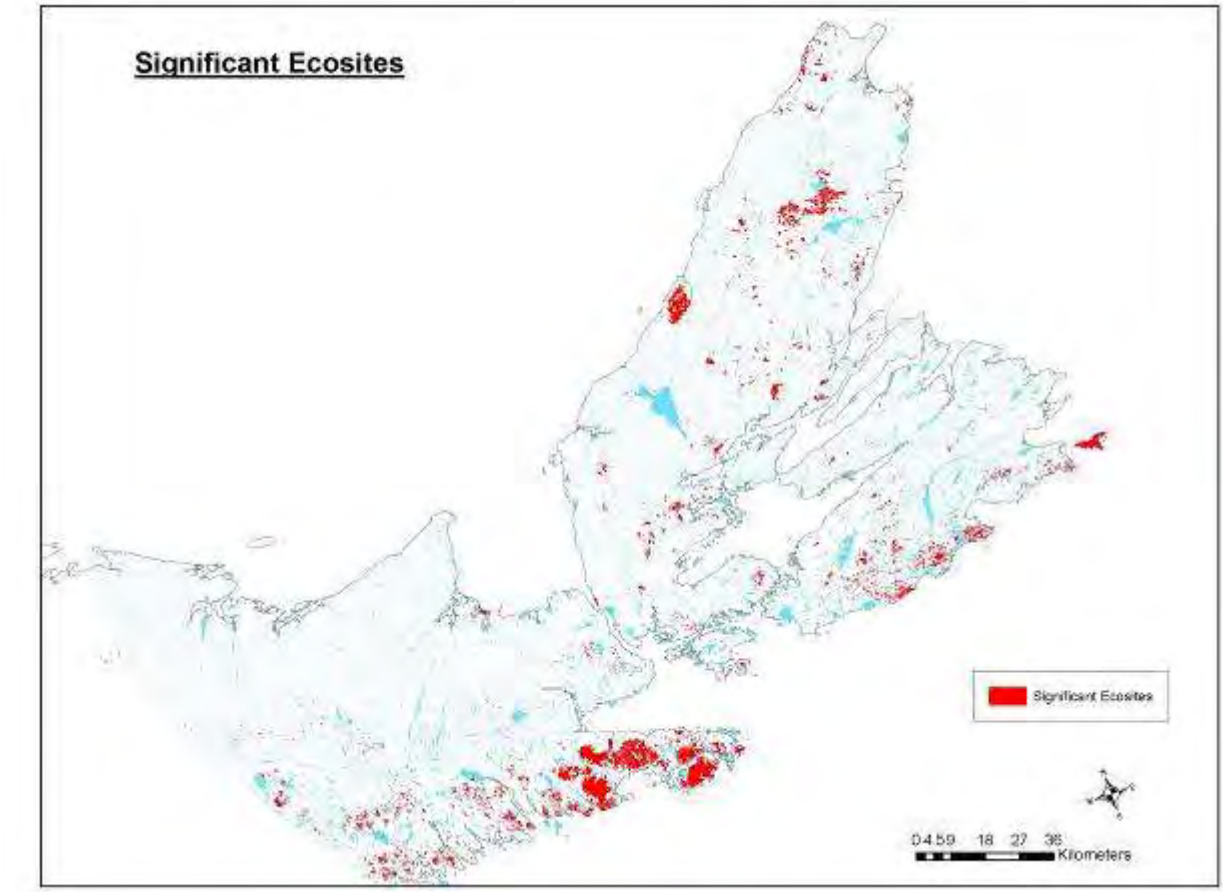


Figure 9-1. Significant Ecosites HCV

Oxbow Lake – River Inhabitants Nature Reserve
NewPage Port Hawkesbury Freehold Protected Area
Photo © David MacKinnon, NSDLF

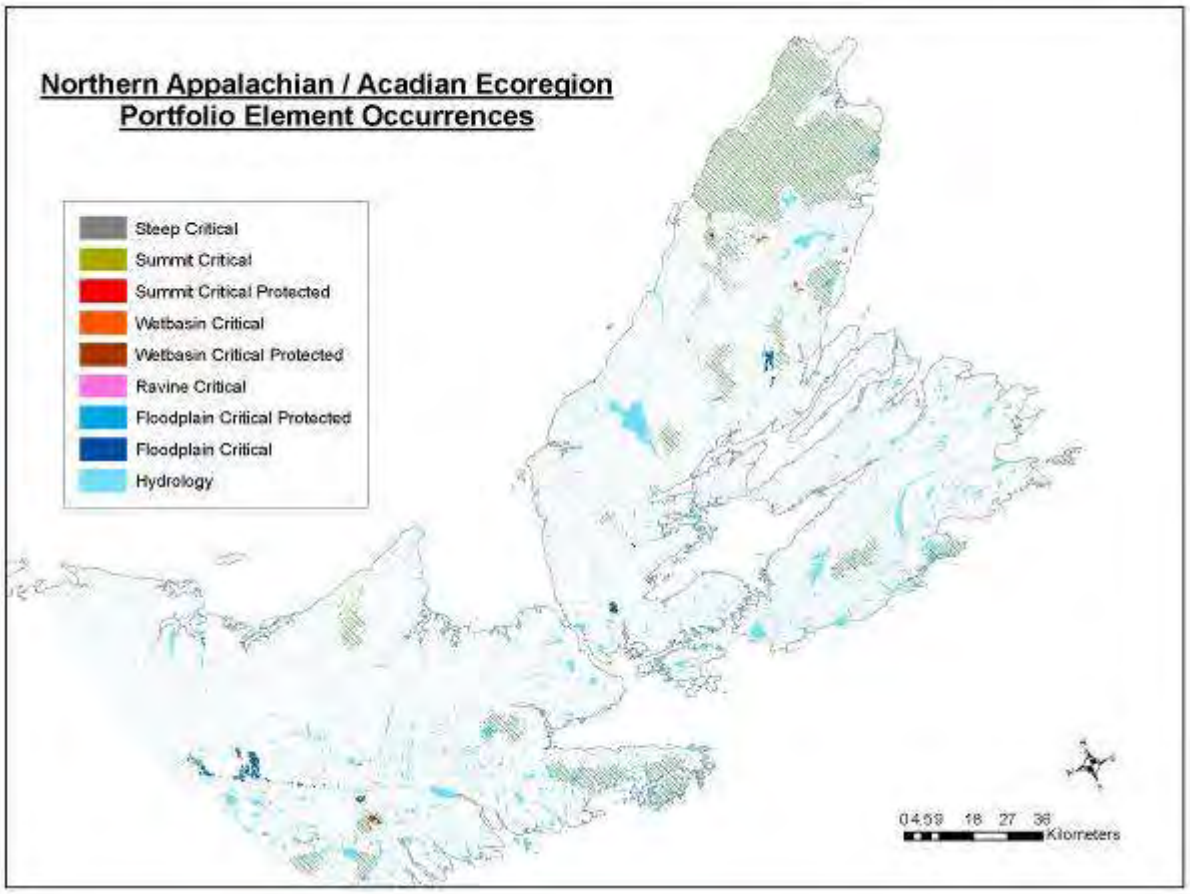


Figure 9-2. Northern Appalachian/Acadian Ecoregion HCV

Management approach

- All significant ecosites identified by the NSE database, with the exceptions noted below, will receive full protection (no harvesting) and road access and fragmentation will be controlled where possible. For all significant ecosites containing a wetland or aquatic component, a buffer zone will be established around these features as per provincial watercourse regulations.

    - The only exceptions for full protection include karst conifer forest, karst hardwood forest, calcareous forest, and hemlock forest. For these rare ecosite-types, these areas will be managed to maintain and restore mature climax conditions for their respective forest-types over time. Further, hemlock stands will always be managed to maintain and restore hemlock, and where hemlock stands occur on floodplains, no harvesting will occur and these areas will be conserved.

- All NAAE layers that are 'critical' or 'critical protected' will receive full protection (no harvesting) and road access and fragmentation will be controlled where possible. For occurrences that contain wetland or aquatic elements, a buffer zone will be established around these features as per provincial watercourse regulations.

Question 9.
Are there ecosystem types or ecosystem type conditions with the forest or ecoregion that have significantly declined, or under sufficient present and/or future development pressures that they will likely become rare in the future (e.g. old seral stages)?

Rationale

In 2022, the Nova Scotia government developed a new Old Growth Forest Policy following the policy first developed in 2012. The new Old Growth Forest Policy outlines the importance of identifying and protecting old forest ecosystems for a variety of ecological, social and cultural values. Excerpts from the new policy state:

> *The landscape in Nova Scotia is heavily forested and Nova Scotians derive many benefits from the woods. Old-growth forest conditions were a more prevalent feature of Nova Scotia's forest landscape prior to European settlement in the 17th century. From that time to the present, forests with old-growth attributes have declined, largely due to a combination of human-caused forest fires (Loo and Ives, 2003), timber harvesting, and agricultural and urban development. Scientific research has made it clear that old-growth forests are indispensable for supporting biodiversity as well as ecosystem services and functions at multiple levels (e.g., carbon storage, waterflow amelioration, soil conservation, and many others).*
>
> *Maintaining and restoring old-growth forests across the province is important for future generations. They are not only supportive of biodiversity but also diverse Mi'kmaq cultural values and practices such as teaching grounds, ceremonial sites, and medicine harvest. Embracing Netukulimk in forestry means respecting the capacities and capabilities of the heterogeneous landscapes that nurture our old-growth forests.*
>
> *By way of this Policy, the Government of Nova Scotia takes a leadership role in and responsibility for protecting and restoring old-growth forests on Crown land and supporting the conservation of old-growth forests on private land. (NSDNRR 2022, Old-Growth Forest Policy, p. 3)*

Methods

The new 2022 Old-Growth Forest Policy has identified three ways that old-growth forests can be preserved over time.

1. Continued protection of old-growth forests in all legally protected areas, as well as a "system of policy-protected conservation forests identified on Crown land. The system of policy-protected forest on Crown land provides opportunities to better represent diverse old-growth forest types across the province that are not adequately represented in legally protected areas." (NSDNRR 2022, Old-Growth Forest Policy, p. 4).
2. Provision of old-growth restoration opportunities where forest stands are not currently old-growth but left to grow would reach old-growth status.

3. Encourage and promote old-growth forest conservation on private lands through easements, education, and other effective means to support private landowners.

The provincial government has identified old-growth forest areas according to the below table.

FEC Forest Group [a]	FEC Vegetation Types [a]	Old-Growth Minimum Tree Age [b]
Tolerant Hardwood	TH1, TH2, TH3, TH4, TH5, TH6, TH7, TH8	140
Spruce-Hemlock (red spruce dominant)	SH3, SH4, SH5, SH6, SH7	125
Spruce-Hemlock (hemlock dominant)	SH1, SH2	140
Mixedwood	MW1, MW2, MW3	125
Spruce-Pine	SP4, SP5, SP7, SP9	125
Wet Coniferous	WC1, WC2, WC5, WC8	100
Coastal (black spruce or balsam fir dominant)	CO1, CO4	100
Coastal (red spruce, white birch, or red maple dominant)	CO3, CO5, CO6	125
Highland (balsam fir or white spruce dominant)	HL1, HL2	100
Highland (yellow birch dominant)	HL3, HL4	140
Cedar [c]	CE1	100
Wet Deciduous	WD3, WD4, WD6, WD8	115
Floodplain	FP1, FP2, FP3	125
Karst	KA1, KA2	125

a (Neily et al. 2013) Late-successional vegetation types listed

b Minimum age- threshold based on published literature of old-forest community ages, published ages of the dominant tree species associated with the forest groups (and vegetation types) (see Appendix 9.2).

c eastern white cedar is listed as vulnerable under the Endangered Species Act of Nova Scotia.

NSDNRR 2022, Old-Growth Forest Policy, p. 7

HCV Decision:

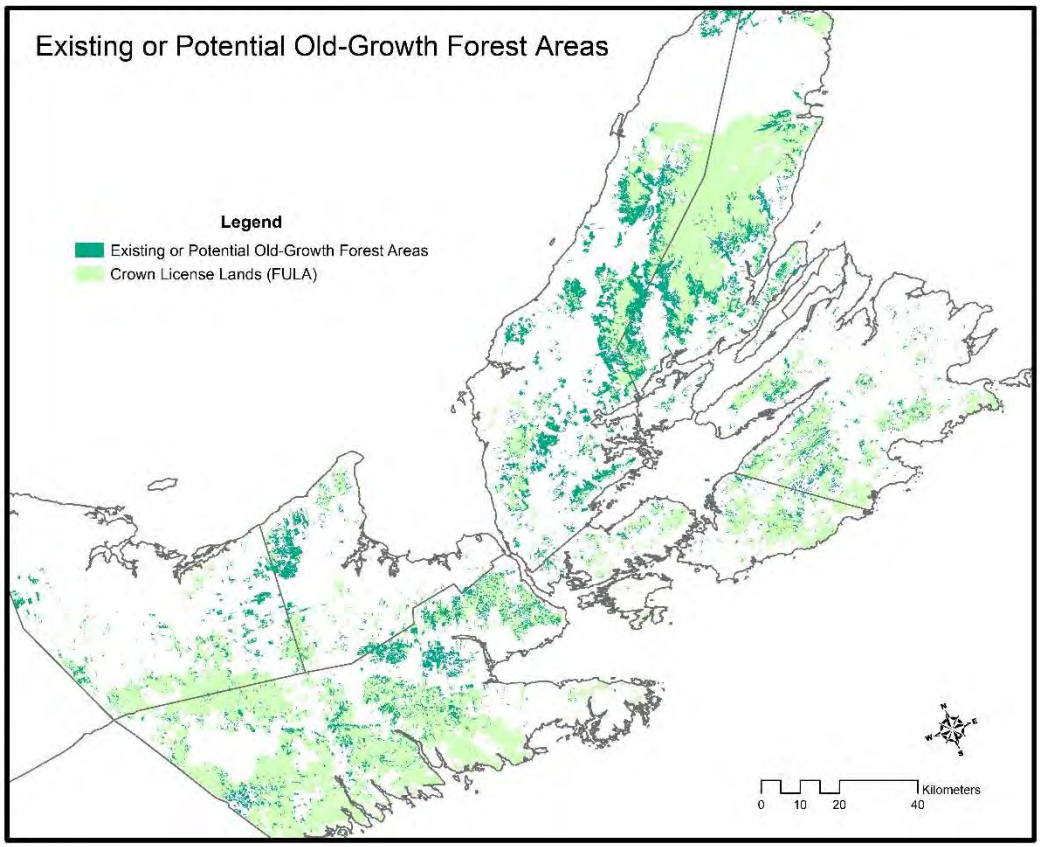
All existing and potential old-growth stands identified by NSDNRR or PHP through the old-growth field assessment procedure are considered HCVs.

Hemlock Forest
Photo: Phil Clark, FSC Certified Private Woodlot Owner

Management approach

All existing old-growth forest stands identified through the new provincial old-growth forest assessment procedure are protected under the 2022 Old-Growth Forest Policy.

Areas identified in the potential old-growth layer that are not assessed as old-growth may become available for forest management or future restoration opportunities. These decisions are made by NSDNRR depending on other factors and conditions in any particular area.



Question 10.
Are there ecosystems that are poorly represented in protected areas, and likely to become rare in an intact state due to ongoing human activities?

Rationale

When the first HCV assessment was completed in 2010, sizeable gaps existed in Nova Scotia's system of protected areas, with only 8.2% of the provincial landmass designated as legally-protected. Some landscapes in the province contained no protected areas, leaving many important ecosystems and natural areas under-represented in the protected areas system. In 2013, the provincial government completed a new parks and protected areas plan for Nova Scotia to increase the legally protected landmass to 12% as outlined in the *Environmental Goals and Sustainable Prosperity Act*. This new plan delivers on that commitment by identifying an additional 200,000 hectares province-wide for protection by 2015 (which will increase legal protection to 13%). As of 2023, the new goal is to protect 20% of Nova Scotia's landmass by 2030.

PHP recognizes the importance that protected areas play in maintaining the natural biodiversity of Nova Scotia forests. Since the first protected areas were legally set aside in 1998, PHP has made huge contributions to the protected areas network of Nova Scotia through both legal and administrative set asides as managers of the majority of the crown license in Eastern Nova Scotia. In addition to protected

areas, PHP implements a vast array of special management practices on the remainder of its holdings to sustain ecosystem function and natural biodiversity.

To evaluate our progress in contributing to the protected areas of Nova Scotia and set forth a plan in moving forward, a Conservation Area Network Gap Analysis was conducted for PHP's Crown lease in collaboration with interested stakeholders. In accordance with the FSC National Standard Criterion 6.5:

The Organization shall identify and protect representative sample areas of native ecosystems and/or restore them to more natural conditions. Where representative sample areas do not exist or are insufficient, The Organization shall restore a proportion of the Management Unit to more natural conditions. The size of the areas and the measures taken for their protection or restoration, including within plantations, shall be proportionate to the conservation status and value of the ecosystems at the landscape level, and the scale, intensity and risk of management activities. (FSC Canada National Standard for Forest Management, p. 51)

Methods

The protected and conserved data layers that make up the Conservation Area Network Gap Analysis for this assessment are described below. Each type contributes to maintaining or restoring ecological integrity across the landscape such as species diversity, critical habitat, wildlife populations, and water quality. The total area for each data layer is provided as general information, however, these do not reflect the total area used in the analysis since there is some overlap between layers (e.g., old growth areas are found both inside and outside protected areas).

Legal and Pending Protected Areas			
Data Source/Description	**Management Objective**	**Total Area (ha)**	**Total Management Unit PHP Area (ha)**
Provided by the Protected Areas Branch of the NSDECC as the most current data source for spatially delineated legal and pending legal protected areas. These areas are not available for forest management and contribute to the provincial protected areas program for protecting natural ecosystems in Nova Scotia.	Protection of representative examples of natural significance, sites and values, and contributing to wilderness recreation activities.	325,389 ha	82,554 ha

Old Growth			
Data Source/Description	**Management Objective**	**Total Area (ha)**	**Total Management Unit PHP Area (ha)**
The NS Department of Natural Resources & Renewables (NSDNRR) recently updated its Old-Growth Forest Area Policy and accompanying spatial data. The current GIS layer lists all old-growth forests and old-growth restoration potential areas that are either protected under this updated Policy and its precursor or as a part of federal/provincial parks and provincial wilderness areas[1]. All forest areas included in the layer are protected from forest management activities.	Protection and restoration of old-growth forests in Nova Scotia.	157,711 ha	49,063 ha

High Conservation Value Forest (HCVF) Conservation Areas			
Data Source/Description	**Management Objective**	**Total Area (ha)**	**Total Management Unit PHP Area (ha)**
These areas were first identified by the provincial government as potential future protected areas. As the protected area plan was finalized, certain areas were removed from the plan. PHP in collaboration with stakeholders during a 2015 HCVF assessment process identified which of the removed areas could be established as PHP conservation areas. The areas identified make up approximately 6,147 ha and have been conserved by PHP since 2015. Management	Protection of intact forests for biodiversity conservation on PHP's management unit.	6,147 ha	6,147 ha

[1] https://pubs.cif-ifc.org/doi/10.5558/tfc2023-018

activities are not permitted in these areas in situ.			

Indigenous Protected & Conservation Area (IPCA)			
Data Source/Description	**Management Objective**	**Total Area (ha)**	**Total Management Unit PHP Area (ha)**
The IPCA concept was created by the federal committee 'Indigenous Circle of Experts' in 2018. IPCA's provide Indigenous governments the primary objective in protecting and conserving ecosystems through Indigenous laws, governance, and knowledge systems. Currently in NS, there is one IPCA that was delineated in 2022 northeast of the Eskasoni First Nation. This area is protected from all forest management activities.	Protection and conservation of ecosystems by Indigenous governments.	9,688 ha	9,688 ha

Atlantic Coastal Plain Flora (ACPF)			
Data Source/Description	**Management Objective**	**Total Area (ha)**	**Total Management Unit PHP Area (ha)**
NSDNRR has mapped a group of Atlantic Coastal Plain Flora that are legally listed under both the Species at Risk Act and the Nova Scotia Endangered Species Act. ACPF are "generally small, slow growing, and occur in habitats such as shorelines, fens, bogs, and estuaries[2]".	Protection of known ACPF sites in NS.	1,679 ha	231 ha

[2] Amended Recovery Strategy and Management Plan for Multiple Species of Atlantic Coastal Plain Flora in Canada - 2016 - Canada.ca

Lichen Buffers (100 m and 200 m)			
Data Source/Description	**Management Objective**	**Total Area (ha)**	**Total Management Unit PHP Area (ha)**
Lichen buffers are created according to the provincial 'At-Risk Lichens Special Management Practices[3]' for Crown land management. Potential lichen sites are surveyed by professional lichenologists and if found, the appropriate buffer width (100 m or 200 m depending on lichen species) is established. Within these buffers, no active forest management can occur. Data is updated and maintained by both PHP and NSDNRR for the management unit.	Conserve known lichen populations and provide sufficient habitat of the right quality and quantity to allow for long-term self-sufficiency.	6,475 ha	3,789 ha

Management Unit Assessment

The below steps were used to assess the Conservation Area Network on PHP's forest management unit. The Conservation Area Network must meet the minimum requirement of 10% as per the FSC standard.

1. Compile legal and pending protected areas, and old growth areas in GIS. This creates a layer that only represents areas protected under legislation (existing and pending) or the provincial policy for old growth areas (Figure 5). The Union function in ArcGIS was used to remove all overlaps so areas were not double counted (Figure 6).
2. An overlay with PHP's management unit was completed to identify the percent of the management unit under protection or conservation.
3. The percent Conservation Area Network was determined as follows:
    a. % CAN = Sum of protected and conserved areas / Management Unit area
4. The resulting % CAN was compared to the FSC minimum requirement of 10%, and any deficit or surplus was reported.

[3] SMP_BFL_At-Risk-Lichens.pdf (novascotia.ca)

Regional Representation Assessment

The below steps were used to assess regional representation of protected areas across 43 unique natural landscapes.

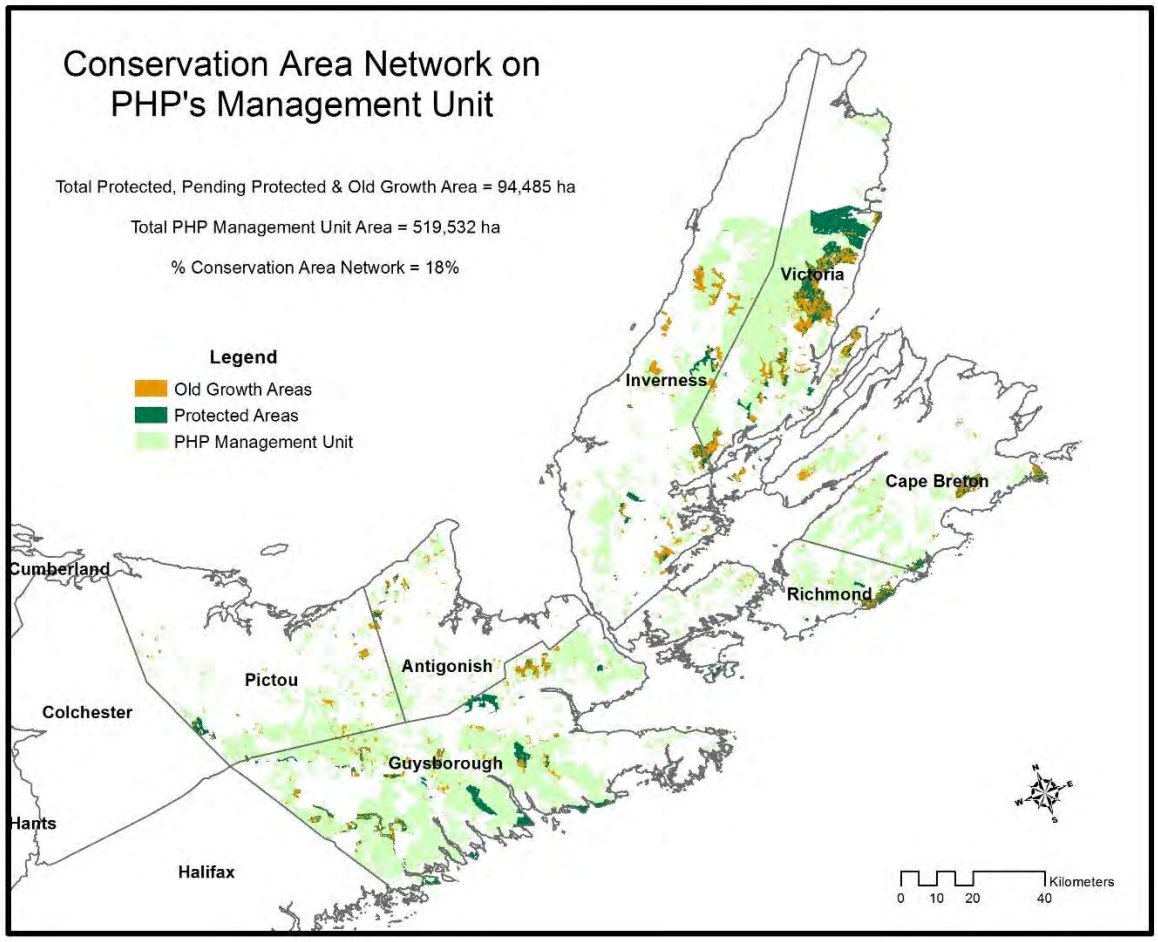
1. Determine the natural landscapes that overlap with PHP's management unit.
2. Extract the full extent of natural landscapes from the provincial dataset (Figure 1).
3. Compile legal and pending protected areas, old growth areas, High Conservation Value Forest (HCVF) protected areas, Indigenous Protected and Conserved Areas, Atlantic Coastal Plain Flora protected sites, and lichen 100 m and 200 m protected buffers (Figure 7). These data layers spatially define areas that are protected or conserved from all forest management activities and contribute to the calculation of the Conservation Area Network Gap Analysis. The Union function in ArcGIS was used to remove all overlaps so areas were not double counted.
4. The percent protected area was calculated in each Natural Landscape for the total landscape area, as well as calculating the percent protected in each Natural Landscape for the PHP management unit lands. This gives an indication of how much protection is at the Natural Landscape scale as well as how much protection is established on PHP management unit lands for comparison between the two scales.
5. For natural landscapes where the percent of PHP's management unit lands per Natural Landscape is 50% or greater, and where percent protected on PHP's management unit lands is less than 17% (Aichi Biodiversity Target # 11 – Convention on Biological Diversity), the Natural Landscape was identified as having ecological gaps. The threshold of 50% or greater of PHP's management unit lands per Natural Landscape was chosen since the majority of the Natural Landscape is located within PHP's FULA lands and provide the best opportunities and influence by PHP on closing any ecological gaps that may exist. Natural landscapes with less than 50% Crown land managed by PHP are viewed as important for government to consider additional protected areas efforts while balancing the needs of other land and resource users (e.g. wind farm development, recreation and trails).
6. For natural landscapes identified as having ecological gaps, further analysis was completed to calculate the percent of each biological eco-unit protected in the identified Natural Landscape on PHP's forest management unit.
7. The percent of biological eco-unit protected was further assessed using the thresholds shown in the table below to identify the most under-represented eco-units needing additional conservation measures.

% Protected	Colour Code	Definition/Criteria	Representivity Rank
0 to 5	Red	Likely to contain less than 55% of the expected number of species	Very poor
5.1 to 17	Orange	Between 55 and 70% of the expected number of species	Poor
17.1 to 24	Yellow	Between 70 and 75% of the expected number of species	Fair
24.1 to 59	Light green	Between 75 and 89% of the expected number of species	Good
59.1 to 100	Dark green	90% or more of the expected number of species	Complete

Results

Management Unit Results

The area inside the management unit (Figure 2) represents all Crown lands licensed to PHP for forest management. Previous contributions by the organization to conservation lands that were formerly within the management unit, but are now removed from forest management activities, were also considered as part of inside the management unit as allowed in the FSC standard (indicator 6.5.7, page 53) as areas that count towards conservation (Figure 5). These conservation lands would have been identified during the first phase of delineating Crown wilderness protected areas as well as during the 2012 protected areas planning process by the NSDECC. Figure 6 illustrates the Conservation Area Network results with overlaps removed between protected areas and old growth areas. Approximately 18% of PHP's management unit is identified as the Conservation Area Network, which meets FSC's requirement of a minimum of 10%.



Regional Representation Results

At the broader regional scale, a protected and conservation area analysis was completed using NSDECC's natural landscapes framework. Using ecological representation thresholds created through research by NSDECC, the Aichi Biodiversity Target of 17% for biodiversity conservation, and minimum of 50% of lands managed by PHP within natural landscapes, a summary of how well each of the 43 natural landscapes in PHP's operating area met these targets was developed. Of the 43 natural landscapes, two were identified as having ecological gaps. These two natural landscapes were further analyzed to identify where the gaps exist. Using other conservation measures currently being implemented through government policies or special management practices that were not included as original inputs into the analysis, resulted in ecological gaps being filled.

As any new information or data related to protected and conservation areas or improved methodology becomes available, the ecological gap analysis will be reviewed and updated at least every five years or sooner. Any substantial changes to the gap analysis will be peer reviewed by an independent expert.

Question 11.
Are large landscape level forests (i.e. large unfragmented forests) rare or absent in the forest ecoregion?

Rationale

Large landscape-level forests are relatively rare within the Northern Appalachian / Acadian Ecoregion, including most parts of Nova Scotia. An analysis of the human footprint in this area demonstrates the human footprint in this region. Thus, in order to maintain and restore the natural processes and ecosystems typical of this region, remnant patches of large landscape-level forests will need to be protected and restored, and critical linkages and corridors will need to be established across the landscape.

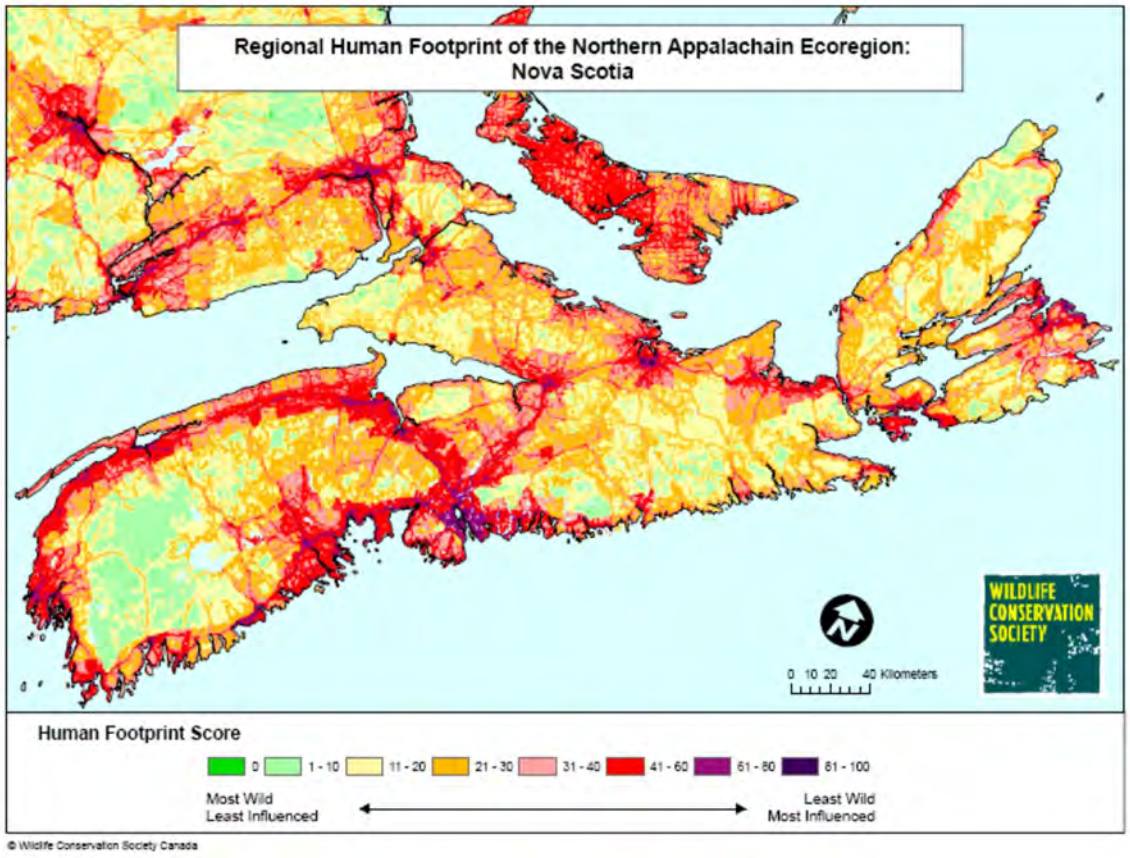


Figure 9-5. Regional Human Footprint – Nova Scotia

Methods

<u>Large landscape-level forests and remnant patches</u>

Large landscape-level forests (> than 10,000 hectares) and remnant forest patches (< 10,000 hectares) have been identified in this HCV assessment under Category 2.

Connectivity zones

Several regional corridors have already been designed and implemented by PHP and are included within the company's existing long-range management plan. These linkages, which are 500m in width, and include a solid 100m core zone, were selected by PHP to provide continuous canopy cover at critical areas on the landscape, particularly between existing protected areas and between designated old forest zones.

Results

For a complete description of the large landscape-level forests and remnant patches identified as HCV's, see Category 2 of this HCV assessment.

Existing connectivity zones within PHP's area of operation are shown below.

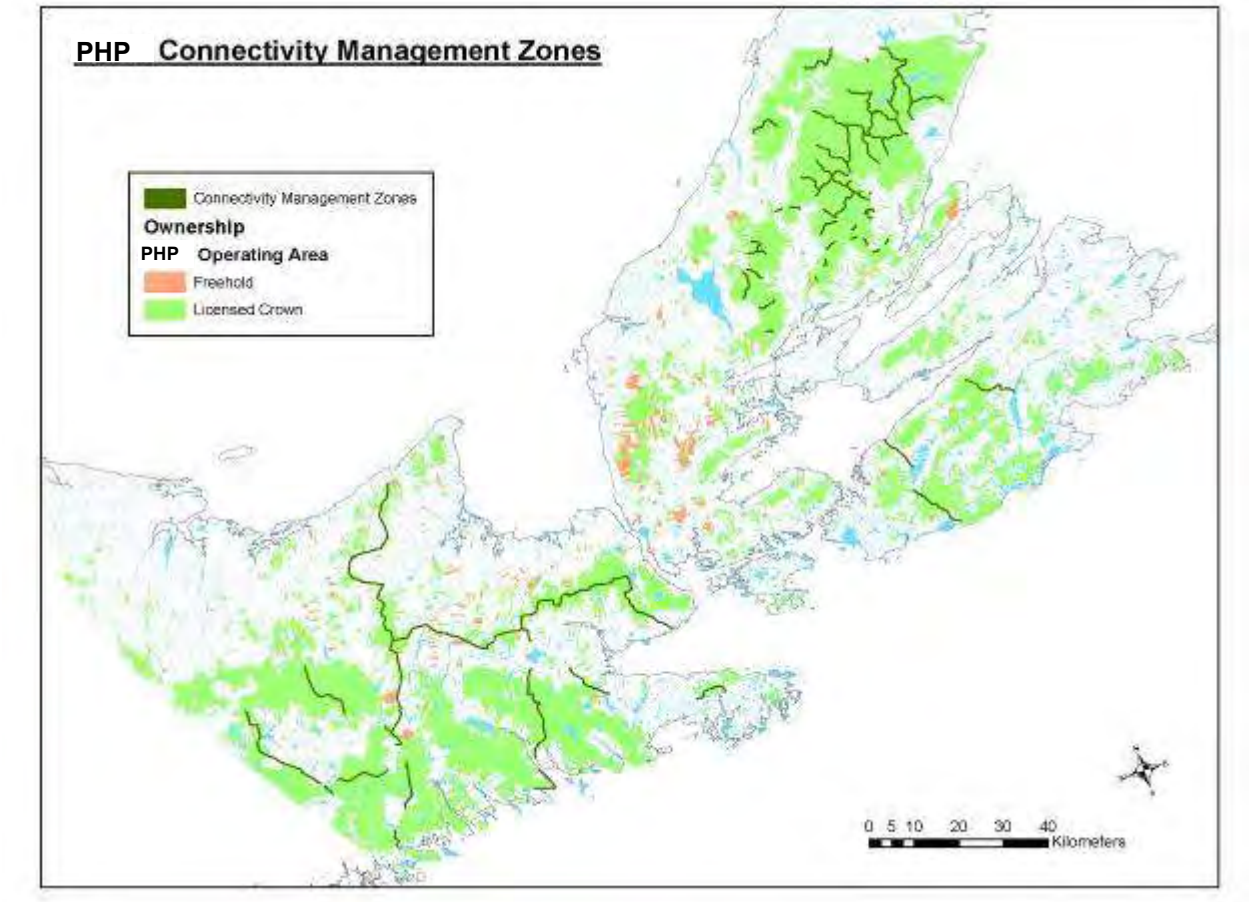


Figure 9-6. PHP Connectivity Management Zones

HCV Decision:

All large landscape-level forests and remnant patches identified under Category 2 are HCV's, as well as existing connectivity zones identified by PHP.

Management approach

The management approach for all large landscape-level forests and remnant patches is described under Category 2.

The PHP connectivity zones will be managed to provide continuous canopy cover within the 500m wide corridors, which will include a solid 100m wide core zone. Although some harvesting will occur within the 500m zones, at no time will these corridors be severed across their width as a result of these treatments. The corridors will not be intensively managed anywhere within the 500m connectivity management zones.

Question 12.
Are there nationally/regionally significant diverse or unique forest ecosystems, forests associated with unique aquatic ecosystems?

Rationale

Intact forests provide a number of important ecological services that benefit adjacent aquatic ecosystems, including controlling water temperature, flooding, erosion, and sedimentation, among others. These forests also provide critical habitat for many important aquatic and wetland species, some of which are rare in Nova Scotia and the NAAE more broadly. These forests must be managed to protect these values and to avoid degrading adjacent aquatic ecosystems.

Methods

Experts on the HCV Assessment Committee were asked to identify key watersheds within PHP's area of operation containing forests associated with important aquatic ecosystems. This analysis was aided by various existing GIS databases for species at risk, significant habitat, significant ecosites, old forest, and large-landscape level forests. Particular attention was paid to the analysis of distributions of aquatic species at risk, namely wood turtle and Atlantic salmon. Watersheds with clusters of these species were flagged by the HCV assessment. Distributions of significant riparian forests were also identified and mapped using the 'forested floodplain' polygons of NSE's significant ecosites database (Refer to Category 3; question #8).

Results

Critical watersheds

St. Mary's River

Clusters of significant ecological values were identified within the St. Mary's River watershed, in mainland Nova Scotia. These values include the presence of species at risk (particularly wood turtle and Atlantic salmon), concentrations of significant ecosites and old forest stands, presence of large intact forests, and presence of rare and irreplaceable ecosystem elements identified in the 'portfolio of occurrences' for the NAAE-CA by the Nature Conservancy.

St. Mary's River
Photo: Raymond Plourde, Ecology Action Centre

Margaree River

Similarly, clusters of significant ecological values were also identified within the Margaree River watershed, on Cape Breton Island. This river system, designated as a Canadian Heritage River, contains some of the most significant Atlantic salmon populations remaining in Nova Scotia. It also contains a number of significant ecosites, continuous stretches of old tolerant hardwood forest, and large intact forests on steep slopes adjacent to the river. The majority of the watershed also still exists in a relatively natural condition and provides important ecosystem services for aquatic ecosystems associated with the Margaree River.

Margaree River

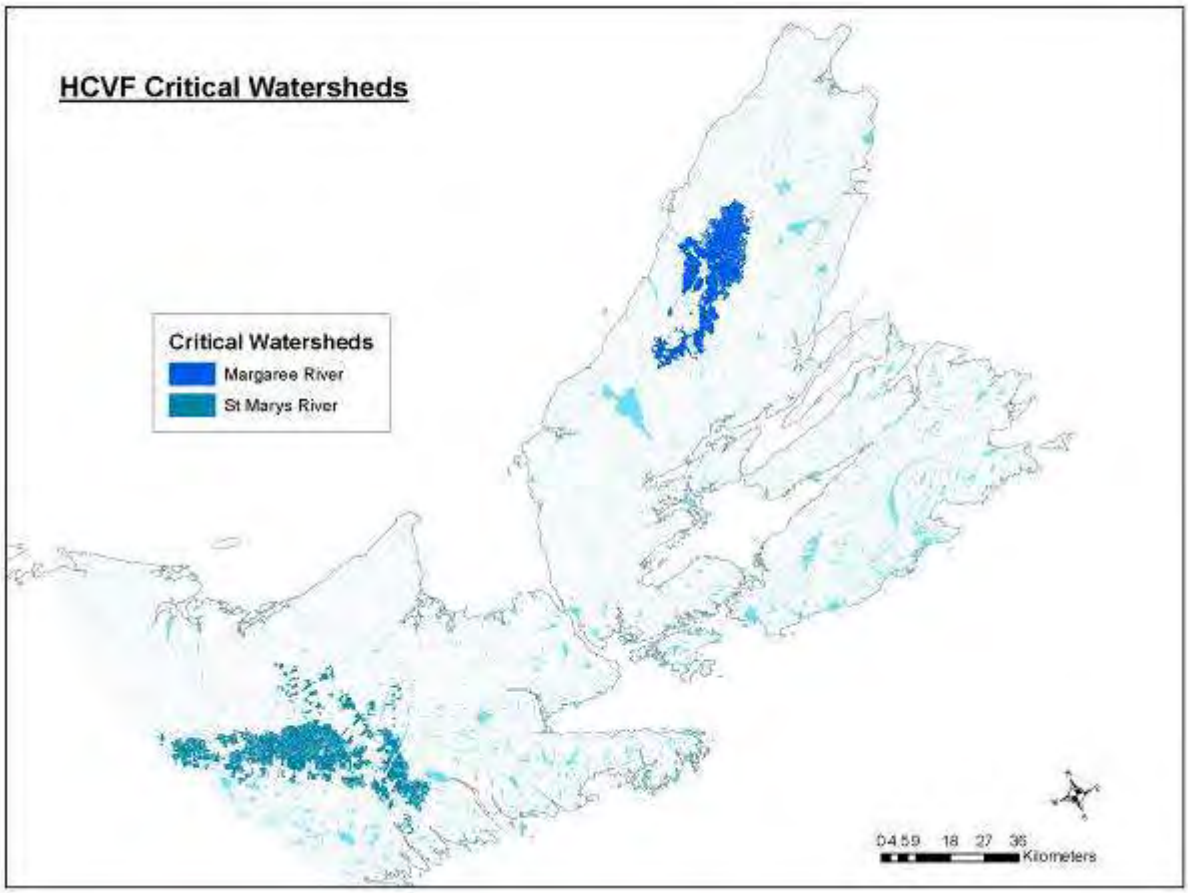


Figure 9-7. Margaree River and St. Mary's River Critical Watersheds HCV

HCV Decision:

All lands within the St. Mary's River and Margaree River watersheds, within PHP's area of operation, are considered HCVs.

All 'forested floodplain' areas identified and mapped within NSE's 'significant ecosite' database are also considered HCVs (refer to Category 3, question #8).

Management approach

- PHP will follow its watershed guidelines and maintain at least 90% of the St. Mary's River and Margaree River watersheds in a natural condition for restoration, and will establish 200m Acadian forest restoration zones (i.e. non-intensive management) along all main watercourses.

- Additionally, the St. Mary's River watershed will be managed to protect important wood turtle populations and habitat, as outlined in Category 1.

- Steep slopes are a critical feature of the Margaree Watershed and will not be harvested using conventional harvesting methods. Currently, no harvest methods are used in steep slope areas and

it is not expected to change. However, any methods developed would be subject to approval by the PHP Forest Advisory Committee.

- All forested floodplains contained in NSE's significant ecosite database will receive full protection and road access will be controlled where possible, as per Category 3, question #8.

8.0 CATEGORY 4: BASIC SERVICES OF NATURE

Category 4: Critical ecosystem services. Basic ecosystem services in critical situations, including protection of water catchments and control of erosion of vulnerable soils and slopes.

Question 13.
Does the forest contribute to maintaining the quality, quantity and seasonal timing for water flows that are a source of drinking water, irrigation water or water for a critical economic activity?

Rationale

Water is the world's most important natural resource since it provides the Earth with the capacity of supporting life. It provides society and communities with vital ecological, economic, and health benefits.

At the watershed level, forest management activities can have significant impacts on the quality and timing of delivery of stream water. Trees tend to buffer large fluctuations in hydrological cycles by intercepting and redistributing precipitation, reducing evaporation, and delaying spring melt. As a result, removal of too large a proportion of forest cover within a watershed can result in increased total stream flow, larger peak stream flows in the spring, increased risk of flooding, increased siltation, nutrient and pollutant loading, and reduced summer stream flows (Kimmins 1987).

These increases in stream flow extremes can have a negative impact on both aquatic life and domestic water consumption. Increased peak flows can result in increased erosion of stream banks, while lower summer flow rates can result in higher water temperatures and reduced water quality. Therefore, proper management of the forest is essential for the maintenance of healthy and abundant water (NewPage Port Hawkesbury, 2006).

Methods

This attribute was assessed through several sources of information including:

- Port Hawkesbury Paper's Policies
- Port Hawkesbury Paper's Sustainable Forest Management Long-term Plan
- Port Hawkesbury Paper's Environmental Management System
- Port Hawkesbury Paper's GIS Database
- Wildlife Habitat and Watercourse Protection Regulations
- Consultation with the Nova Scotia Environment

Results

PHP currently implements several water quality protection measures as part of its everyday forest management operations and complies with all federal and provincial regulations concerning water use and management. For example, the provincial *Wildlife Habitat and Watercourse Protection Regulations"* requires the company to establish a minimum 20 meter riparian buffer along all streams 50 cm wide or greater and all waterbodies (non-treed wetlands, bogs, lakes). As percent slope increases adjacent to these areas, the riparian buffer is increased. The purpose of these buffers is to provide

shade for maintaining cool stream temperatures, stablize stream banks, and filter silt and nutrients from overland flow. Wildlife habitat benefits are also provided.

Through the company's Environmental Management System and forest certification commitments since 2002, the company has invested considerable efforts into developing and applying practices that reduce or eliminate site specific impacts such as rutting, ground disturbance, erosion, and fuel storage, which can have negative impacts on water quality. Work instructions and training on water quality protection practices are provided to all company personnel and contractors through the Environmental Management System. Both internal and third-party auditing to the FSC and SFI forest certification standards, ensures that these practices are carried out properly. Longer-term effects on timing and magnitude of stream flow events must be addressed through long-term planning procedures.

The company's Sustainable Forest Management Long-term Plan has outlined a first step towards watershed-level management through development of Indicator 3.2.1 with the objective of protecting hydrological functions in all watersheds. The indicator statement is "*proportion of identified watershed area (that is managed by PHP) in a closed forest condition with a target of each watershed maintaining 80% of its area (that is managed by PHP) in a closed forest condition (> 10 years of age)*." The PHP definition of a 'closed forest condition' is supported by the Nova Forest Alliance's Criteria and Indicator Report (> 10 years), and the Fundy Model Forest Criteria and Indicator Report (> 10 to 12 years). Although neither report identifies a minimum allowable percentage in a closed forest condition, other watershed studies indicate a minimum of 60% to 80%. To err on the side of caution, the company has identified 80% as the required minimum for a closed forest condition in each identified watershed.

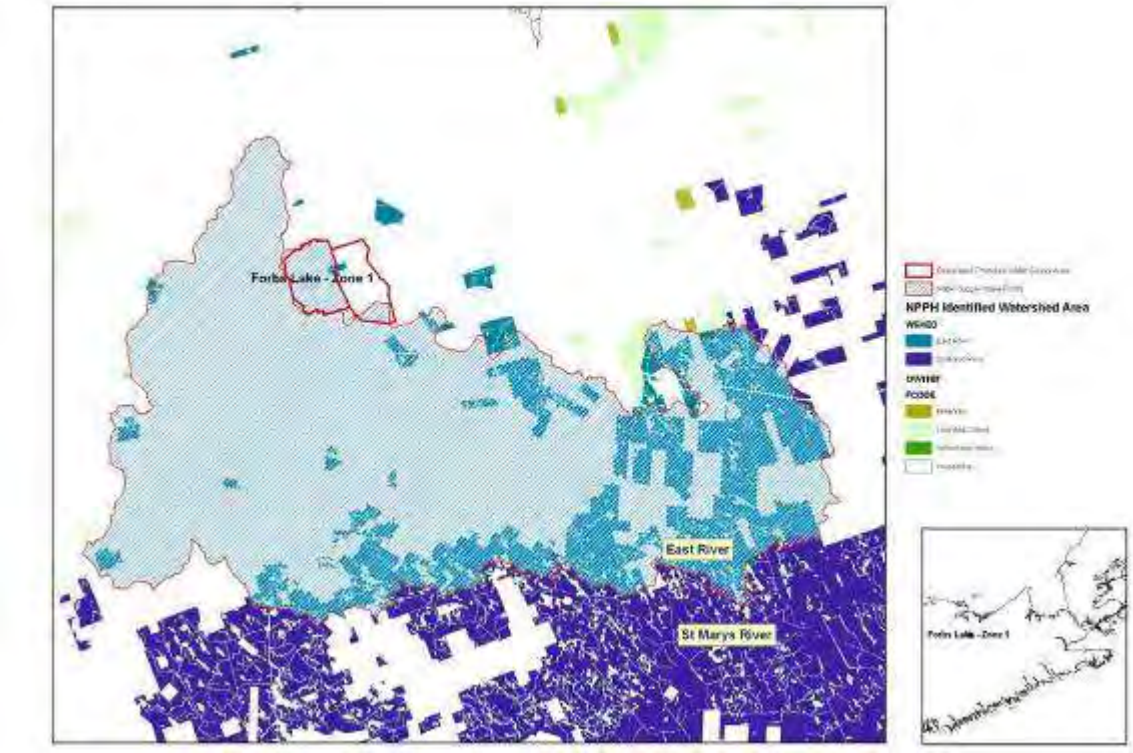
To measure this indicator, a total of 17 watersheds were selected for special management and monitoring. Six of these watersheds are municipal watershed areas that were designated for special management during the provincial Integrated Resource Management process in 1998. These are:

- Antigonish Municipal Water Supply Area
- Guysborough Municipal Water Supply Area – 1
- Guysborough Municipal Water Supply Area – 2
- Inverness Municipal Water Supply Area
- Pictou Municipal Water Supply Area
- Victoria Municipal Water Supply Area

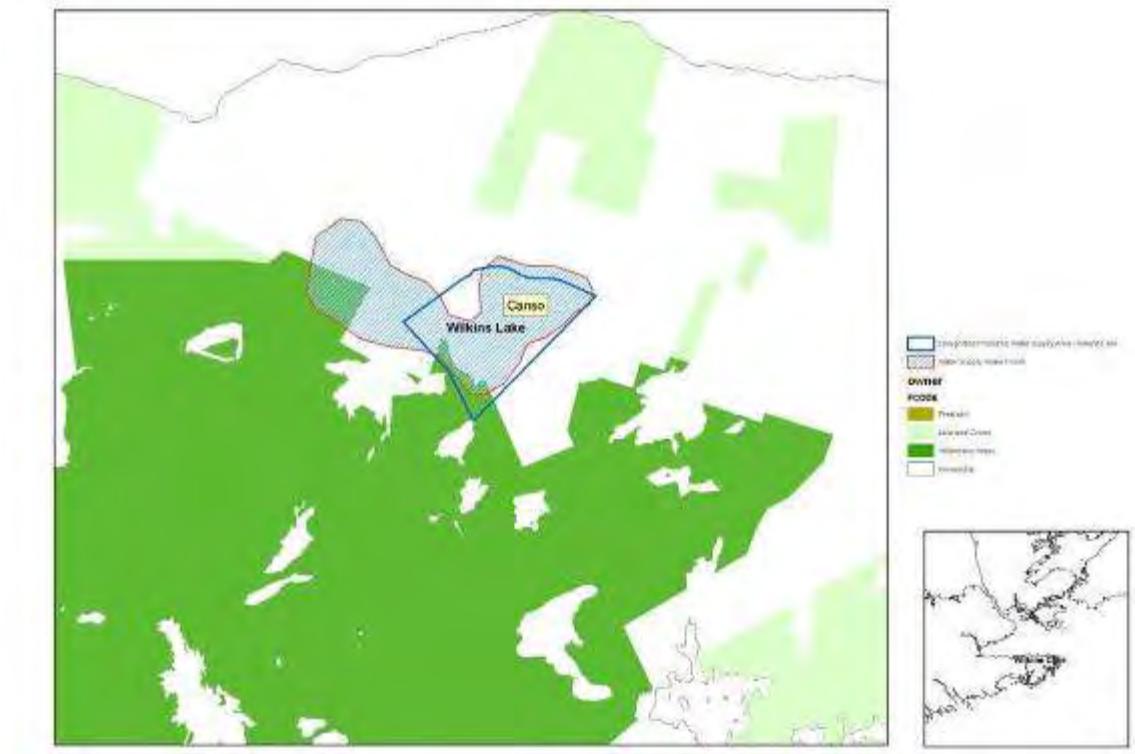
Since then, the Antigonish municipal water supply area has been designated as the James River Water Supply Area under the Environment Act (*1994-95, c. 1, s. 1.*). Other legally protected water supply areas under the Environment Act that are within PHP's operating area are:

- Forbes Lake
- Wilkins Lake

James River Protected Water Supply Area



Forbes Lake Protected Water Supply Area



Wilkins Lake Protected Water Supply Area

Each protected water supply area mentioned above has its own set of regulations related to management and use activities within the supply area. Regulations related to forestry operations, road construction and watercourse alteration, stream crossings, and watercourse setbacks and buffers are adhered to by the company. As evident in the above maps however, the amount of land managed by PHP is either very small (e.g. Forbes Lake) or the land within the area is established as a legally protected wilderness area where management activities are prohibited.

For the municipal water supply areas not legally protected but identified by PHP as important watersheds for special management (Guysborough Municipal Water Supply Area – 1; Guysborough Municipal Water Supply Area – 2; Inverness Municipal Water Supply Area; Pictou Municipal Water Supply Area; Victoria Municipal Water Supply Area), PHP staff participate in watershed management committees if established (e.g. Sherbrooke Watershed – Guysborough; New Glasgow Watershed – Pictou). Elements such as cutting practices, recommended future treatments, road construction and maintenance, and contaminant spill prevention have been developed for watershed plans with the goal of promoting a healthy forest that will maintain water quality and quantity.

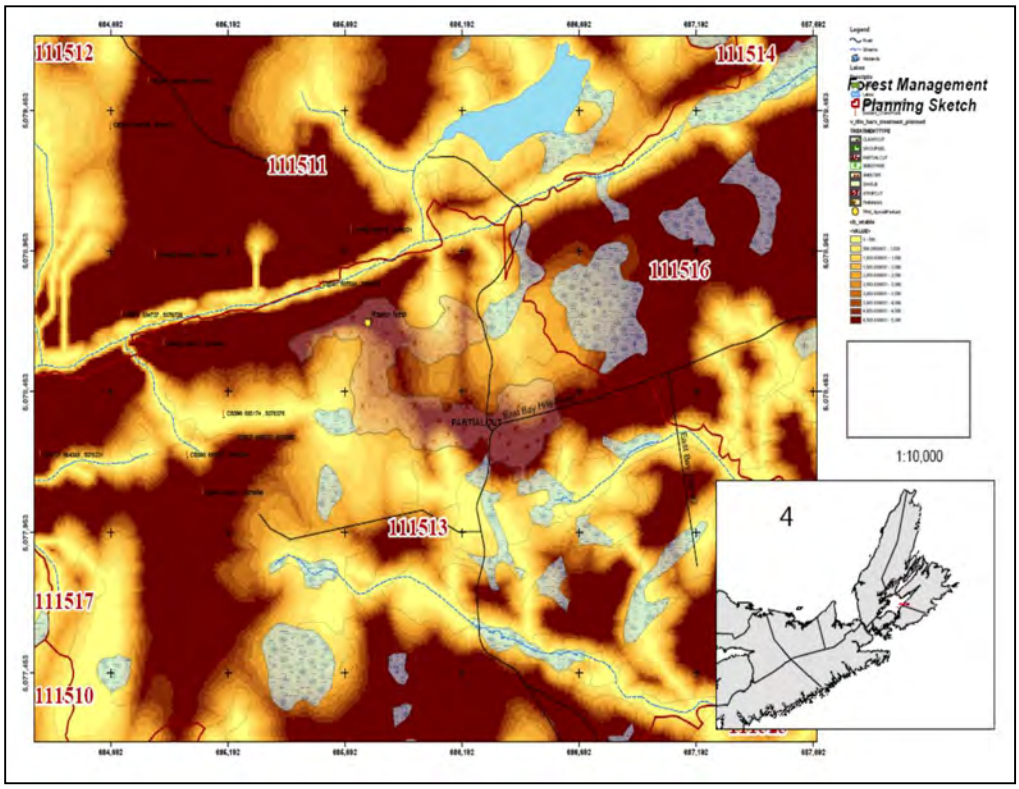
The remaining 11 watersheds of special management identified by PHP are large watersheds which have a high proportion of their total area under the management of PHP. Any of the 17 watersheds that do not maintain a minimum 80% closed-forest condition (as defined above) has scheduled clearcut harvest activities temporarily suspended until the watershed reaches the desired target of 80% or greater.

Table 9: Current Closed Forest Condition for Special Watershed Areas on PHP Lands

Watershed Name (and total hectares managed by PHP)	% Closed Forest 2013	% Closed Forest 2012	% Closed Forest 2011	% Closed Forest 2010	% Closed Forest 2009
Antigonish Municipal Watershed (647 ha)	100%	100%	100%	100%	100%
Guysborough 1 Municipal Watershed (2515 ha)	100%	100%	92%	93%	93%
Guysborough 2 Municipal Watershed (9 ha)	100%	100%	100%	100%	100%
Inverness Municipal Watershed (125 ha)	95%	95%	79%	79%	79%
Pictou Municipal Watershed (40 ha)	90%	88%	100%	100%	100%
Victoria Municipal Watershed (962 ha)	96%	98%	98%	98%	100%
Baddeck River Watershed (15545 ha)	95%	99%	93%	93%	97%
East River Watershed (9468 ha)	95%	94%	89%	89%	91%
Grand River Watershed (5662 ha)	82%	85%	82%	82%	81%
Liscomb River Watershed (12760 ha)	91%	96%	90%	90%	93%
Margaree River Watershed (29118 ha)	98%	100%	91%	92%	96%
Middle River Watershed (15757 ha)	94%	99%	92%	92%	95%
Mira River Watershed (13337 ha)	100%	100%	92%	93%	92%
New Harbour River Watershed (452 ha)	98%	98%	99%	99%	99%
North River Watershed (16108 ha)	92%	96%	79%	84%	93%
River Inhabitant Watershed (4922 ha)	96%	96%	94%	94%	94%
St. Mary's River Watershed (51293 ha)	93%	96%	90%	90%	92%

Municipal water utilities are responsible for treating drinking water supplied from groundwater or surface water for approximately 60% of Nova Scotians. They are further responsible for complying with provincial standards that ensure the water supply is properly managed and protected (NSDOE Website: http://www.gov.ns.ca/nse/water/publicwater.asp).

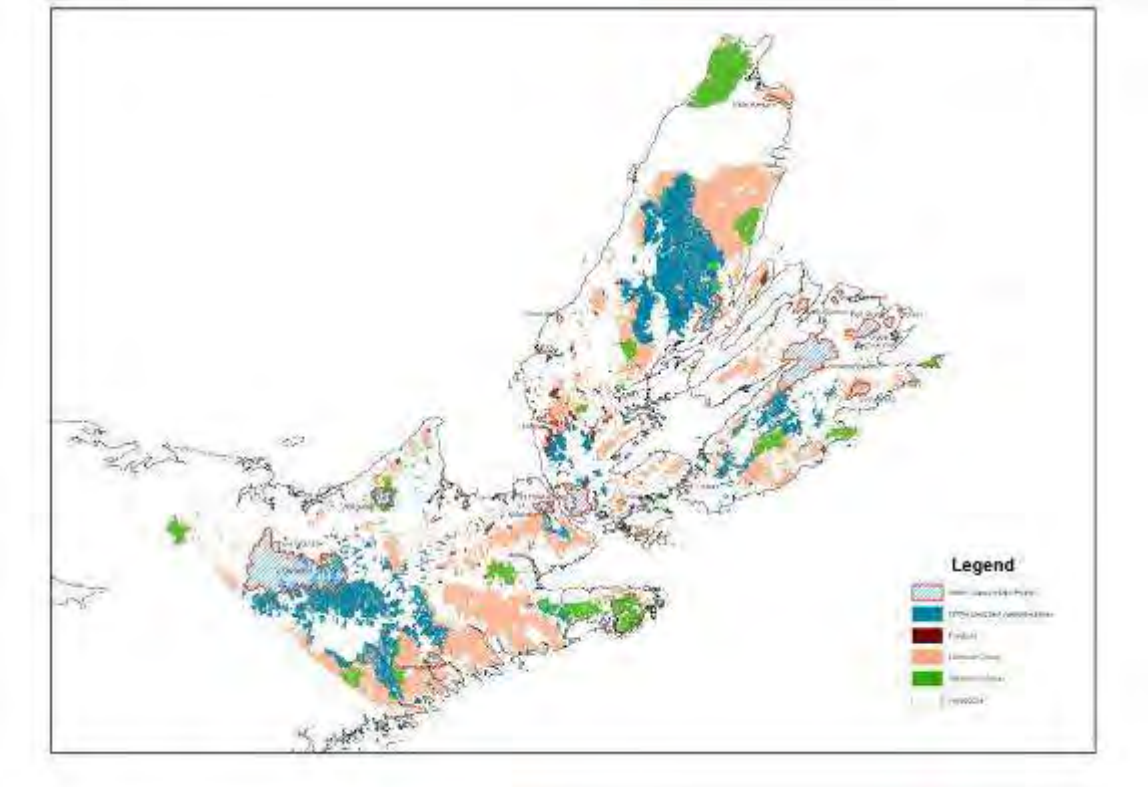
The company also maintains a comprehensive GIS database with several spatial layers representing various features such as lakes, streams, wetlands, watershed areas, and depth-to-water table. Contractors are provided with operating maps that display all hydrological features in the area. These maps are used for the establishment of riparian buffers as well as identifying the best location to establish forwarding trails. The depth-to-water table layer shows the expected depth-to-water at any point in the landscape. The below example shows an area with varying depths-to-water. Areas colored in brown represent the driest areas and yellow represents the wettest. Contractors use these maps to determine the best location for forwarding trails to minimize impacts to soil and water.



The Nova Scotia Environment has also delineated water supply intake areas, which are natural surface watershed areas upstream of municipal surface drinking water supply intake points. The intake areas found in PHP's operating area are shown in the below table and map.

WATER SUPPLY INTAKE AREA	Total PHP Area	Total Intake Area	Proportion
Antigonish	2213	3686	60%
Arichat	13	458	3%
Baddeck	2414	4805	50%
Canso	21	158	14%
Coxheath/Westmo	2383	18361	13%
Glace Bay	53	3685	1%
Judique	592	1367	43%
Louisbourg	1674	2480	68%
Louisdale II	27	267	10%
Mulgrave	821	2093	39%
Neils Harbour	457	997	46%
New Glasgow	11	780	1%
Port Hawkesbury	313	5401	6%
Sherbrooke	1044	2132	49%
St. Peter's	4	116	4%
Stellarton	10749	41235	26%

Grand Total	**22797**	**88029**	**26%**



Water protection measures taken by the company within these areas include the provincial *Wildlife Habitat and Watercourse Protection Regulations*, monitoring of % closed forest condition, steep slope management, HCV aquatic watershed management, ground disturbance and rutting mitigation procedures, and fuel tank and roadside piling requirements.

HCV Decision:

All legally protected municipal water supply areas, the 17 watersheds identified by PHP as important for monitoring % closed forest condition, and the water supply intake points are considered HCV's under this question.

Question 14.
Are there forests that provide a significant ecological service in mediating flooding and/or drought, controlling stream flow regulation, and water quality?

Rationale

In general, all forests provide a significant ecological service in mediating flooding and/or drought, controlling stream flow regulation, and water quality. Circulation of water between land and the atmosphere is a vital global process, and is crucial to all life through the provision of clean water. Large

scale disturbances to this cycle can have devastating consequences at the regional, continental and global scales. As a result, it is important to maintain this cycle in its appropriate balance (PHP 2006).

Alteration of forested areas can impact water cycling through changes in the holding capacity. Increasing the amount of non-forested area increases the amount of runoff and may increase or decrease the overall evaporation rate. Proper forest management does not involve long-term changes in the amount of area that remains unforested. However, through forest harvesting, areas are changed from a forested to a non-forested condition (i.e. PHP considers this to be less than 10 years of age.) Since these changes are transitory, the total non-forested area at any given time is variable depending on the rate of harvest. It is this total area of non-forest than can have an effect on global hydrological cycles, flooding, drought, stream flow regulation, and overall water quality.

Methods

This attribute was assessed through several sources of information including:

- Port Hawkesbury Paper's Policies
- Port Hawkesbury Paper's Sustainable Forest Management Long-term Plan
- Port Hawkesbury Paper's Environmental Management System
- Wildlife Habitat and Watercourse Protection Regulations
- Special Watershed Areas including municipal watershed areas
- Wetlands Inventory and Management Recommendations
- Provincial Hydrological Data
- Consultation with the Nova Scotia Environment

Results

Many of the results written for question 13 can also apply to question 14, particularly the mentions related to the *Wildlife Habitat and Watercourse Protection Regulations*, special watershed areas, protected municipal water supply areas, and water supply intake points. In addition, PHP has established an indicator and monitors every five years the percent of total productive forest area in a closed forest condition (> 10 years of age) for the entire forest management area. The stated target is to maintain more than 80% of the total productive forest area in a closed forest condition. In 2013, the status of this indicator was 85% (i.e. in a closed forest condition) for the entire PHP forested landbase. PHP is confident that a closed forest condition of 80% or greater for the total productive forest area is a good measure of maintaining healthy hydrological functions across the forest landscape.

There are a number of wetlands on PHP lands that perform critical physical and biological functions including flood control, ground water replenishment, trapping of sediments, trapping and oxidation of pollutants, and climate regulation. In addition, they provide important wildlife habitat, recreational areas, and educational and scientific opportunities (NSEHJV 1994).

PHP became a participant in the Eastern Habitat Joint Venture Stewardship Project in August 1992, through the signing of a wetland stewardship agreement with the Province of Nova Scotia. This agreement aimed to: 1) maintain the existing wetlands base on company-owned and public lands managed by the company in a healthy and productive state; and 2) enhance the production potential for waterfowl and other wildlife on selected wetlands. The Stewardship Project resulted in the completion

of an inventory to determine number, classification and location of wetlands on company managed lands. A total of 5,126 wetland types were identified on public lands under lease to the company.

Table 10: Nova Scotia Wetland Classes on Provincial Crown Land under License to PHP

Wetland Class	Number of Wetlands		Area in Hectares	
	Mainland	Cape Breton	Mainland	Cape Breton
Open Water	75	425	527	3,753
Deep Marsh	8	3	89	36
Shallow Marsh	2	5	39	30
Seasonally Flooded Flats	0	0	0	0
Meadow	29	14	150	64
Shrub Swamp	285	99	1,053	904
Wooded Swamp	3	1	3	1
Bog	1,970	2,207	11,692	14,473
TOTALS	**2,372**	**2,754**	**13,553**	**19,261**

The project further provided the company with 1) general guidelines for wetland conservation for all wetlands; 2) specific management recommendations for selected sites; and 3) special management recommendations for the provision of cavity nest boxes, beaver management, and for wetlands known to harbour rare wildlife species. General guidelines focused on maintaining wetland function by dealing with issues such as buffer zone maintenance, heavy machinery and harvesting within special management zones, road construction, and forest harvesting practices. These guidelines, as well as other special management recommendations for selected sites, were implemented by the company. Many of the recommended guidelines have since been replaced by the *Wildlife Habitat and Watercourse Protection Regulations*. These regulations stipulate the following management activities as adhered to by the company:

Special management zones

(1) Where the average width of a watercourse situated on or adjacent to forest land on which a forestry operation is carried on is equal to or greater than 50 cm, a forestry operator shall establish or ensure the establishment of a special management zone of at least 20 m in width along all boundaries of the watercourse.

(2) Where the land on which a special management zone is established pursuant to subsection (1) has an average slope within 20 m of a watercourse boundary of greater than 20%, the forestry operator shall increase the width of the special management zone by 1 m for each additional 2% of slope to a maximum of 60 m in width.

(3) No forestry operator shall within a special management zone

> **(a)** permit the use of, use or operate a vehicle for forestry operations within 7 m of the watercourse;

(b) reduce the basal area of living trees to less than 20 m^2 per hectare; or

(c) create an opening in the dominant tree canopy larger than 15 m at its greatest dimension.

(4) Despite clause (3)(a), the operation of a vehicle for the purpose of watercourse crossings approved by the Department of Environment and Labour is permitted within a special management zone.

Protection of watercourse less than 50 cm wide

(1) Where the average width of a watercourse situated on or adjacent to forest land on which a forestry operation is carried on is less than 50 cm, no forestry operator shall permit the use of, use or operate a vehicle for forestry operations within 5 m of the watercourse, except for the purpose of watercourse crossings approved by the Department of Environment and Labour.

Provisions applying to all watercourses

(1) A forestry operator shall ensure that understory vegetation and non-commercial trees within 20 m of the edge of any watercourse are retained to the fullest extent possible.

(2) No forestry operator shall conduct any activity within 20 m of the edge of any watercourse that would result in sediment being deposited in the watercourse.

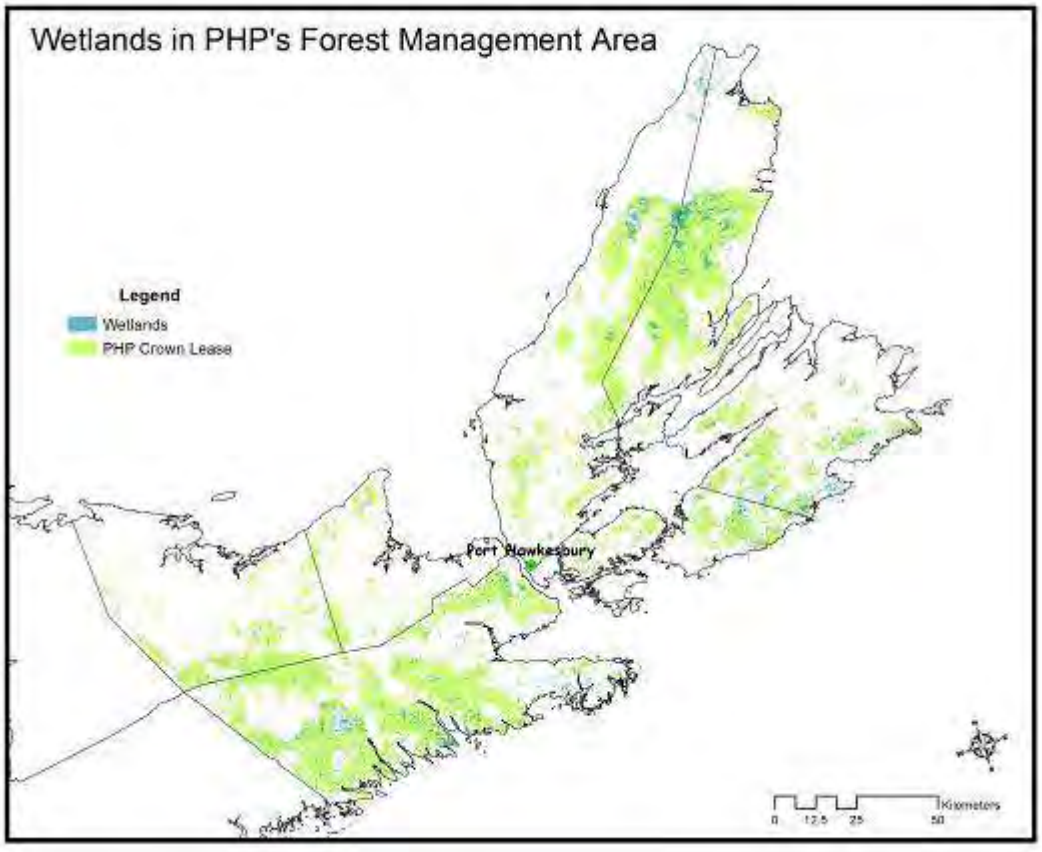


Figure 10-1. Wetlands on PHP Lands

HCV Decision:

All legally protected municipal water supply areas, the 17 watersheds identified by PHP as important for monitoring % closed forest condition, water supply intake points, and wetlands are considered HCV's under this question.

Question 15.
Are there forests critical to erosion control?

Rationale

Soil erosion has ramifications not only for water quality through increased sedimentation, but also for site productivity. Loss of soil reduces the ability of an area to produce healthy forets and if severe enough, can result in loss and maintenance of vegetative cover. Steep sloped areas are particularly sensitive to erosion due to the increased potential velocity of runoff. The ability of water to remove and transport soil is a function of both volume and velocity of the runoff. As a result, mineral soil exposure in steep sloped areas can result in erosion (PHP 2006).

Regular harvesting activities can result in some soil damage during felling and transportation of trees to roadside. However, on steeper sloped areas these techniques may not be sufficient to prevent long-term damage of the site.

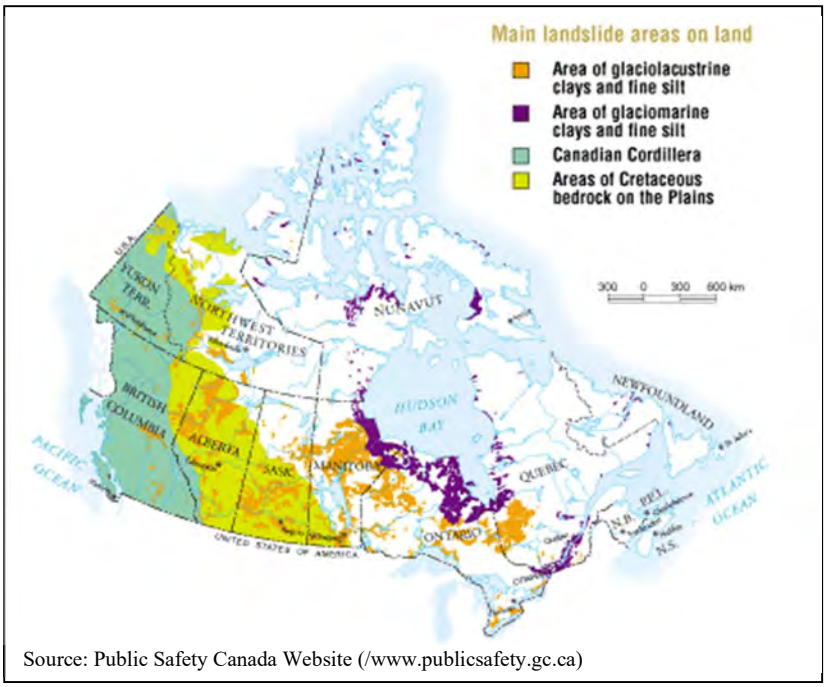
Methods

This attribute was assessed through several sources of information including:

- Port Hawkesbury Paper's Policies
- Port Hawkesbury Paper's Sustainable Forest Management Long-term Plan
- Port Hawkesbury Paper's Environmental Management System
- Digital Elevation Model
- Contours

Results

Nova Scotia is not a province conducive to landslides or avalanches due to its relatively flat terrain compared to central and western provinces. The highest elevation in Nova Scotia is 532 meters in the Cape Breton Highlands National Park (based on 10 meter provincial contour data). The average elevation for Cape Breton is 155 meters while it is 108 meters on the eastern mainland of Nova Scotia.



Source: Public Safety Canada Website (/www.publicsafety.gc.ca)

Figure 10-2. Main Landslide Areas in Canada

Forest harvesting on steep terrain or in areas with fine-textured soils would pose the greatest risk for erosion. The company's Environmental Management System has implemented several operational guidelines for the protection of forest soils, minimizing soil damage, and soil productivity health, which are both internally and externally audited for compliance.

PHP identified steep sloped areas, for the purpose of operations, in its Sustainable Forest Management Long-term Plan. Through discussions with operations and planning staff, PHP considers areas with greater than 30% average slope to be steep sloped areas (total of 39,573 ha identified. All harvest activities are not permitted in areas with 30% average slope or greater.

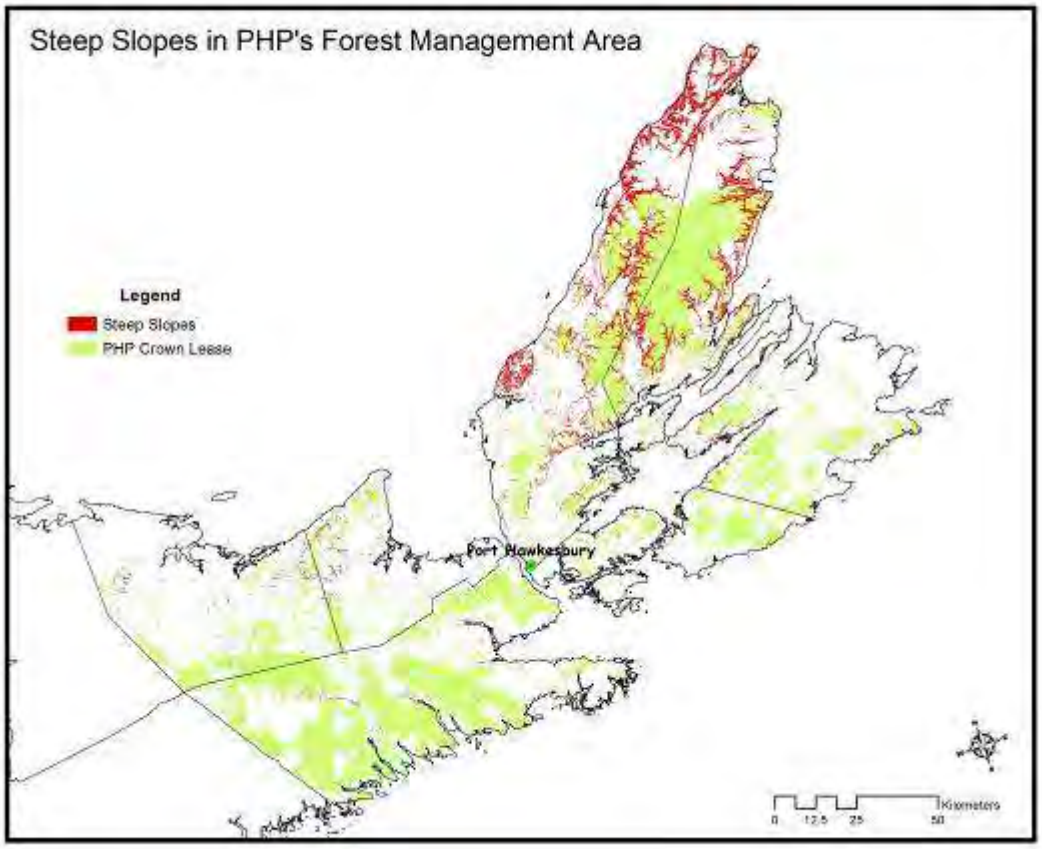


Figure 10-3. Steep Slope Areas on PHP Lands

HCV Decision:

Steep slope areas as identified by PHP are considered HCV's under this question.

Management Approach

All harvest activities are not permitted in areas with 30% average slope or greater.

Question 16.
Are there "interface" forests that play a significant role determining the potential spread of wildfires into developed areas, or other areas where fire would be harmful?

This question has been identified as not relevant in Canadian forest ecosystems (see Appendix 4 in FSC Canada National Boreal Standard). Regardless, the abundance of hydrological features across the Acadian forest landscape, as well as roads and natural hardwood stands, all act as natural barriers to wildfire spread. Additionally, PHP's requirements for fire equipment on all harvest jobs during fire season, and the provincial government's Wildfire Centre which provides a province-wide coordinated

suppression effort and fire preparedness monitoring system, greatly reduces the risk of uncontrolled and destructive fires. Therefore, no HCV is identified for this question.

9.0 CATEGORY 5: BASIC NEEDS OF LOCAL COMMUNITIES

Category 5: Community needs. Sites and resources fundamental to satisfying the necessities of local communities or Indigenous Peoples (for livelihood, health, nutrition, water, etc.), identified through engagement with these communities or Indigenous Peoples.

Question 17.
Are there local communities that use the forest? (This should include both people living inside the forest area and those living adjacent to it as well as any group that regularly visits the forest.) Is anyone within the community making use of the forest for basic needs/livelihoods? (Consider food, medicine, fodder, fuel, building and craft materials, water, income.)

Rationale

The public use of forest lands for recreation, timber, medicinal plants, accessibility, hunting and fishing, to name a few, illustrates the wide variety of values held by the general public on the forest environment. In Nova Scotia, 80% of the land-base is considered forest (NSDNRR 2008), which has likely increased from decades earlier when agricultural activity was more prevalent. Today, much of the abandoned farmland has returned to a forested condition. In the distant past, Nova Scotia forests provided building materials for houses, buildings, ships, wharves, barrel staves and for heating purposes (NSDNRR 2008). Today, the forests provide materials for pulp, paper, value-added wood products, and non-timber forest products (NTFPs). There are multiple non-timber forest products and uses in Nova Scotia (NSDNRR 2008) including:

- Tourism and viewscapes
- Protected areas
- Recreation and leisure
- Education and learning
- Biochemicals
- Food/forage
- Crafting
- Aesthetics and spiritual experiences
- Hunting, fishing and trapping
- Culture and heritage

In Nova Scotia, approximately 50% of the forested land area is owned by small private woodland owners. Another 25% is owned by large industrial companies, while the remaining 25% is publicly owned land of which the majority is allocated to forest companies for timber management. Approximately 24% of all Nova Scotians live throughout the seven eastern counties where PHP manages

forest land and there are 59 towns and villages scattered throughout the company's operating area including seven Mi'kmaq First Nation communities.

Methods

This attribute was assessed through several sources of information including:

- Port Hawkesbury Paper Sustainable Forest Management Long-term Plan
- Port Hawkesbury Paper Environmental Management System
- Port Hawkesbury Paper Third Party Request Database
- Nova Scotia Code of Forest Practice
- NSDNRR Integrated Resource Management Process
- Netukulimk GIS Management Project (Union of Nova Scotia Indians project)
- Awakening: living with today's forestry (First Nations Forestry Program of NS manual)
- PHP Forest Advisory Committee
- Public input during Open House sessions
- Consultation with all Regional Development Authorities (RDA) in PHP's operating area including:
    - Antigonish Regional Development Authority
    - Guysborough Regional Development Authority
    - Pictou Regional Development Commission
    - Cape Breton County Economic Development Authority
    - Strait-Highlands Regional Development Authority

Results

<u>Provincial Government Integrated Resource Management Process</u>

Community use of the forest in eastern Nova Scotia is extensive and varied. This was evident during the provincial government's Integrated Resource Management (IRM) process which initially began in 1998 and still continues today through the Nova Scotia Department of Natural Resources and Renewables. IRM is a planning and decision-making process that coordinates resource use so that the long-term sustainable benefits are optimized and conflicts among users are minimized. IRM brings together all resource groups rather than each working in isolation to balance the economic, environmental, and social requirements of society. The process is designed to ensure that multiple benefits are realized while maintaining the values of a public land base for current and future generations (NSDNRR 1998).

PHP was actively involved in the initial round of IRM sessions which included workshops, open houses, presentations and handouts. These sessions provided the public with an opportunity to identify issues and activities surrounding the use of Crown lands in eastern Nova Scotia. Furthermore, it enabled the government to categorize Crown lands into three classes which were spatially delineated:

- Category 1 – Crown lands will be available for a full range of uses with few anticipated conflicts among users;
- Category 2 – Crown lands will have competing values and land-uses and therefore will require some form of management to optimize multiple use while minimizing conflicts;
- Category 3 – Crown lands will be specifically allocated to special uses and other resource uses may be limited or denied.

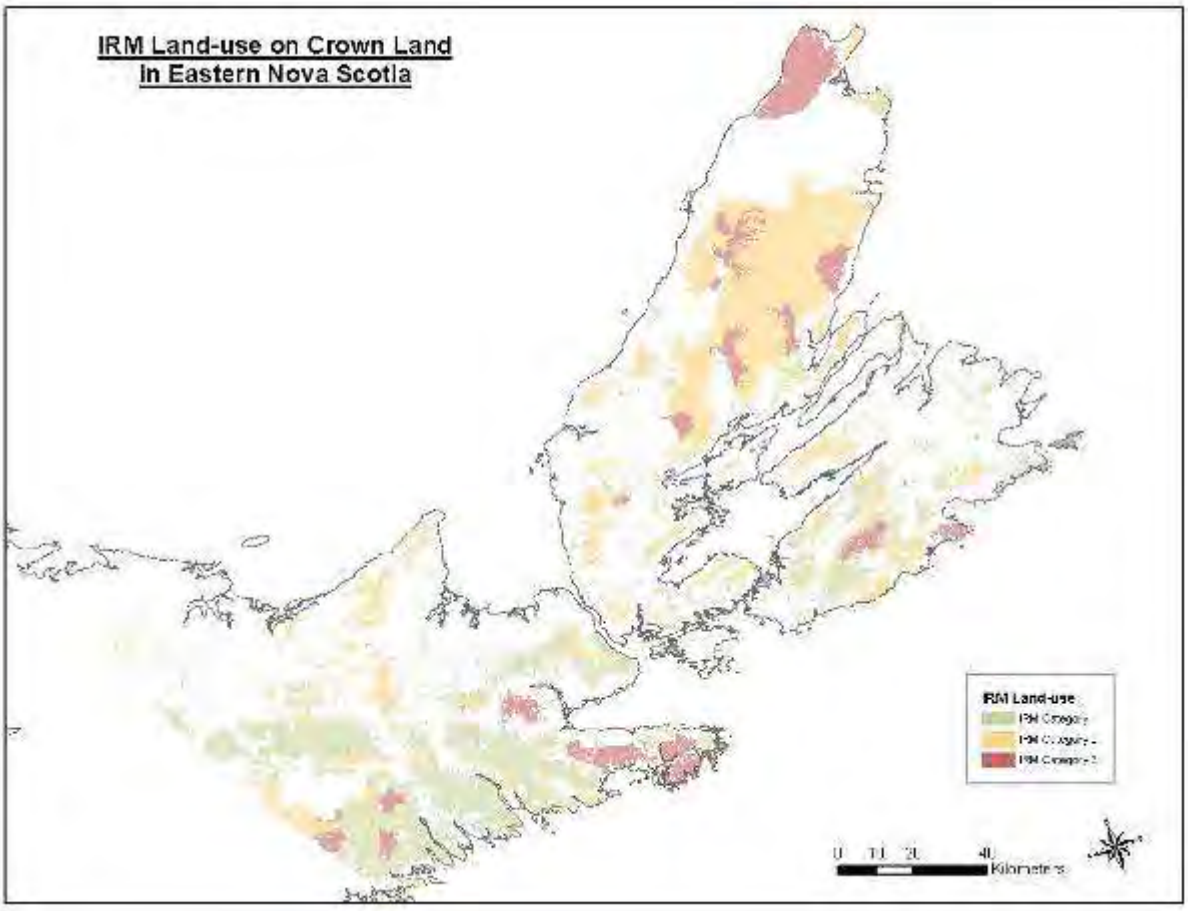


Figure 10-4. Integrated Resource Management Land-use Categories on Crown Land in Eastern NS

Potential conflicts between land-use within the three categories are identified and handled through the Crown management approval process with the Department of Natural Resources and Renewables.

In 1998 throughout communities in eastern Nova Scotia, a total of nine public information sessions were held which were hosted by the provincial government and the PHP. During those sessions, people were asked to identify any issue or activity related to Crown lands in eastern Nova Scotia. A summary of activities is provided in Table 11.

Table 11: Identified Activities on eastern Crown land during the 1998 IRM Process

ACTIVITY	NUMBER OF RESPONSES
Archery	1
ATV's	41
ATV's/Snowmobiles	3
Berry Picking	15
Bird Watching	2
Boating	11
Camping	6
Canoeing / Kayaking	15
Cycling	6
Development	24
Drinking Water	24
Exploration	19
Fishing	35
Fossil Collections	12
Fuelwood	15
Hiking	1
Hiking/Ski Trails	98
Horseback Riding	1
Hunting	31
Hunting/trapping/fishing	5
Multiple Use	77
Nature viewing	27
Other	13
Prospecting	13
Research	6
Snowmobiling	51
Swimming	1
Trapping	2
	TOTAL RESPONSES 557

First Nation Forest Values and Uses

In Nova Scotia, there are 13 First Nation communities of which seven are located in eastern Nova Scotia where PHP manages land. First Nation history and culture is inextricably linked to the land and the resources it provides. Historically, basic needs such as food, clothing and shelter were provided from the land. In addition, the land was home to important places such as burial and sacred areas. It can be said that all of these needs, basic or otherwise, relate to the First Nation cultural identity. Rather than separate the assessment of basic needs from cultural needs between HCV category 5 and category 6, a comprehensive review of First Nation forest values and uses will be covered entirely under category 6.

PHP Initiatives Related to Public Forest Use

The forests of Nova Scotia serve a variety of purposes at the community level ranging from timber harvest, non-timber harvest such as fir tipping, maple syrup production, and berry picking, and recreation and tourism. PHP recognized long ago that residents of rural communities depend on the forest for a variety of social and economic benefits. Historically, the roads built and owned by the company for forest management access have been left open to the public year-round for general access. However, some restrictions will be implemented on some roads to meet HCV commitments to maintain critical habitat features.

The company has established an on-going systematic approach to process public requests for "third party" use of licensed Crown lands and/or freehold lands. To date, there have been approximately 1,700 third party requests put forward to the company for approval since the first request was submitted in 1964. Unless there are conflicting uses between the public and the company, all requests are approved and the regional Department of Natural Resources and Renewables office is notified of third-party use on Crown lands. All requests are stored in a tracking database and are spatially identified by PHP's management unit. As required, district staff and the Department of Natural Resources and Renewables are responsible for monitoring third-party use.

Table 12: Third Party Request Types Submitted to PHP

Request Type
Access to Listed Highway
Bear Sites
Brush
Camp
Construct a Road
Crown Land Withdrawal
Dump
Easement
Easement/Road Construction
Forward Wood/Use Road

Freehold Sale
Fuelwood
Gravel
Gravel & Easement
Harvest
Harvest Fuelwood
Harvest Hardwood Logs
Harvest Lathe Wood
Land
Landscape
Land Trade
Lease
Mineral Exploration
Misc
Parking Area
Pipe
Right-of-Way
Rail Line Agreement
Road Use
Recreation
Stockpile Hardwood
Survey
Trail (Build/maintain)
Turn
Use of Spring
Well Site
Wind (easement)

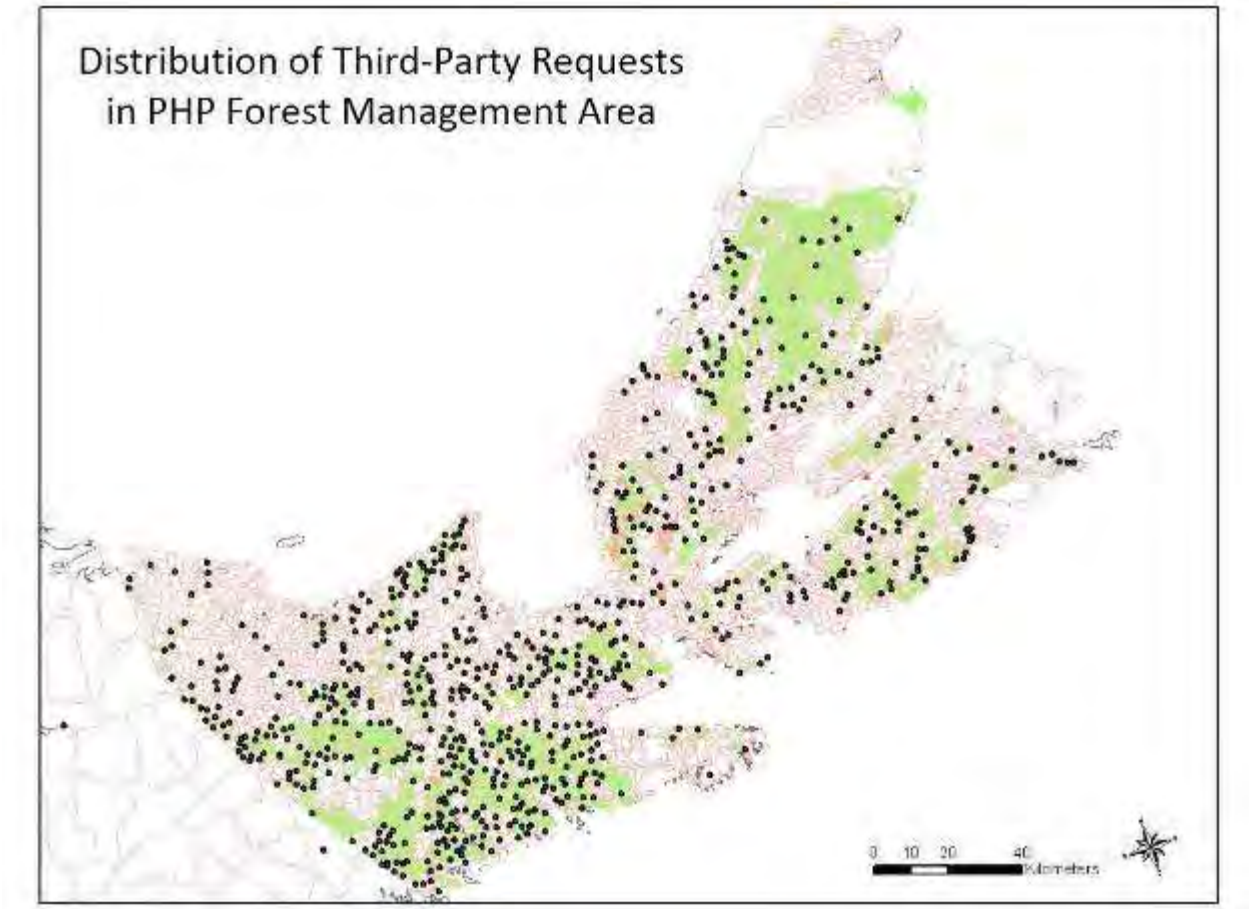


Figure 10-5. Third Party Requests Submitted to PHP by General Public. Note that there can be several requests in one management unit, so not all points are visible because of scale.

There are several trail users and groups in the province that use Nova Scotia forests for recreational activities. Represented by the Nova Scotia Trails Federation, the more than 6,000 trail users and over 70 trail groups access the forest for snowmobiling, hiking, all-terrain vehicular travel, horseback riding, cross-country skiing, back-country camping, and fishing (source: http://www.novascotiatrails.com/). Trail maps are maintained by the individual trail groups, however, most groups do not have their trails spatially delineated through a GIS. Regardless, PHP does not restrict access to any trail user or group on licensed Crown lands or freehold lands. Occasionally, a request is submitted to the company for the development of a new trail and if there are no conflicting uses or environmental limitations, the request is approved.

To further identify forest uses by local communities, PHP compiled a list of possible high conservation values based on the general categories put forward in HCV question 17: food, medicine, fodder, fuel, building and craft materials, water, and income. Tourism and recreation, and forests that sustain subsistence agriculture are also relevant issues in PHP's forest management area. The table below summarizes uses based on input from staff who live and work in the forest management area, PHP's Forest Advisory Committee (where there is representation by government, recreation and tourism groups, and wildlife and fishing associations), any input received at open houses held by PHP, consultation with the five Regional Development Authorities in PHP's management area, and online searches for relevant information.

General	*Value*	*Description*	*Known rare locations?*	*Threatened by current activities?*	*HCV?*
Food	Moose	Moose hunting is a regulated activity in Nova Scotia. Moose hunting is an important year-round cultural activity and food source for many Cape Breton native communities. Important food source for some communities north of Cape Breton Highlands National Park. Overly abundant populations on Cape Breton Island. On mainland Nova Scotia the moose is an endangered species.	Mainland moose is a provincially listed endangered species. Hunting of Mainland Moose is strictly prohibited by all people. The Cape Breton population is considered healthy.	Only Mainland Moose are known to be threatened by current forestry activities. Where moose are hunted and may be an important food source they are considered overly abundant, and not considered threatened by forestry activities to a level where significant declines would be seen in moose populations. It is well known that forestry activities can create preferred habitat conditions for moose on the landscape so long as there is a fair distribution of age class structure and species composition to provide important habitat components.	Cape Breton moose are considered an important food source for Aboriginal communities. Since the Cape Breton population is considered abundant and healthy, PHP does not restrict access to its lands for hunting, and moose habitat is modelled in the long-term plan and monitored as an indicator, the Cape Breton moose population is not considered a HCV. However, the Mainland Moose is a HCV due to its endangered status in the province (see Category 1).

General	*Value*	*Description*	*Known rare locations?*	*Threatened by current activities?*	*HCV?*
Food	Deer	Deer hunting is regulated activity in Nova Scotia. It is an important recreational activity in Nova Scotia, but is not a critical source of food for any communities. It is not known to be critically important for First Nation communities.	No.	Deer wintering areas are identified and mapped by the Department of Natural Resources and Renewables. Any possible threats to deer habitat through forest management activities are addressed through the DNR approval process.	No. Hunting activities and road access to hunting areas are not restricted by the company.
Food	Bear	There is a regulated bear hunting season in Nova Scotia. Bear is not considered a critical food source for local communities and the population is considered healthy.	No	Changes in habitat structure occur as a result of forest management activities.	No. Hunting activities and road access to hunting areas are not restricted by the company.
Food	Furbearers, Small/Upland Game	There is a regulated furbearer and upland game season in Nova Scotia. Furbearers listed as species at risk in PHP's operating area are the Canada Lynx and the Pine Marten.	Canada Lynx and Pine Marten are rare in the province and legally listed as endangered. Trapping is strictly prohibited.	Changes in habitat structure occur as a result of forest management activities.	No. Hunting activities and road access to hunting areas are not restricted by the company.

General	*Value*	*Description*	*Known rare locations?*	*Threatened by current activities?*	*HCV?*
Food	Fish	There are several regulated angling seasons in Nova Scotia for fish such as salmon, trout, smallmouth bass, smelt, perch, and pickerel. Special Management Areas have been identified by the NS Department of Fisheries and Aquaculture, which may affect bag limit, season length, length limit of fish retained, and gear type. There are 11 Special Management Areas in PHP's operating area.	No, however important cold water refugia areas for salmon and trout have been identified. These are described under category 1 of this report as HCV's.	Changes in habitat structure occur as a result of forest management activities.	Cold water refugia areas for salmon and trout are considered HCV. See pages 59 to 63 for HCV designation and management.
Medicine	Medicinal Plants	Medicinal use of plants is found within the native community and it is unknown if they are commonly found and used beyond First Nation lands.	Unknown	This will be addressed through HCV 6.	Currently unknown.
Fodder	Cattle Grazing	Cattle grazing occurs on the Cape Breton Highlands plateau through the summer, as	Yes	No. Grazing activities are not threatened by, and are in fact encouraged, by	Yes

General	Value	Description	Known rare locations?	Threatened by current activities?	HCV?
		well as, to a lesser degree, the mainland Keppoch.		existing forest management practices through the creation of regenerating areas and the maintenance of road systems.	
Fuel	Wind power generation	Areas of the PHP landbase have high potential for wind power generation.	Yes	Wind power generation and existing forestry practices can easily co-exist. Wind power policy already in place which tries to encourage its development.	No.
Fuel	Fuelwood	Some designated fuelwood areas exist, but are not on the PHP license, and are managed through the Department of Natural Resources and Renewables. Other areas do receive requests for fuelwood cutting.	No.	No. Requests for fuelwood cutting are handled through the company's Environmental Management System as a third-party request.	No.
Building and Craft Materials	Christmas wreaths	Tipping of Balsam Fir for making Christmas wreaths is an important economic activity in some areas, particularly the	No. Balsam fir is very plentiful.	No – Young vigorous balsam fir is preferred by collectors.	No.

General	*Value*	*Description*	*Known rare locations?*	*Threatened by current activities?*	*HCV?*
		Cape Breton Highlands.			
Building and Craft Materials	Lobster traps	Small black spruce is used in the traditional construction of lobster traps. Wet, inoperable areas are preferred.	No. Black spruce is very common.	No - preferred areas are not impacted by forestry operations.	No.
Building and Craft Materials	Wood turning	Hardwood burls are sometimes collected for turning into bowls and other crafts.	No – Burls are common throughout the landbase.	Yes – Hardwood management will tend to remove poorer quality trees.	No.
Water	Private wells/ground -water for personal water use (include any easements across freehold land); public drinking water	A constant supply of clean drinking water is essential to every community. There is a solid regulatory framework in the province for water quality health and protection.		Forestry activities can have an impact on water quality. Management actions taken by PHP through regulatory requirements and operational practices strive to minimize threats to water quality health.	Middle River NewPage Freehold Protected Property (easement for water access for private use on adjacent residential property). This easement is a legally binding agreement. The freehold property has been in a protected state since 1998 by PHP.
Income	Forest harvesting and silviculture	The forest industry is an important source of income for	No – Common throughout.	No – Strong sustainability strategies in place through	No.

General	Value	Description	Known rare locations?	Threatened by current activities?	HCV?
		many communities in Eastern Nova Scotia.		CSA, SFI and FSC certifications.	
Income	Maple Syrup	Some maple syrup licenses are located on Crown Land. Any existing operations on Crown Land are removed from the PHP Licensed area.	Yes.	No – Do not exist in operating area.	No.
Income	Trapping	Trapping does occur in Eastern Nova Scotia, however it is almost always as a hobby or second income.	No – Dispersed.	No – Habitat changes can occur through forestry practices. However, this is addressed through wildlife regulations and CSA Indicators.	No.
Tourism and Recreation	Guiding	A relatively small guiding industry exists, although it is typically providing a second income.	No – Dispersed.	No – Habitat changes can occur through forestry practices. However, this is addressed through wildlife regulations and CSA Indicators	No.
Tourism and Recreation	Heritage	Old community and farm sites are common throughout Eastern Nova Scotia.	No – Typically dispersed and not rare.	No – Most archeologically significant sites are located in areas not typically	No.

General	*Value*	*Description*	*Known rare locations?*	*Threatened by current activities?*	*HCV?*
				accessed for forestry. Special Aboriginal sites will be addressed through HCV 6.	
Tourism and Recreation	Trails	Hiking, snowmobile and ATV trails are common throughout Eastern Nova Scotia.	No – Dispersed across the landbase.	No - Hiking trails can be impacted by adjacent cutting, however this problem is addressed through the IRM process and EMS work instructions.	No.
Tourism and Recreation	Viewscapes	Many scenic areas are present in Eastern Nova Scotia, which are important to the tourism industry.	Yes.	No – Issues are addressed through the PHP viewscape policy, the IRM process, and work instructions related to minimizing impacts to highly visible areas.	Highly visible areas as identified by PHP are considered HCV. Management activities to mitigate impacts to aesthetics will continue as currently defined.
Tourism and Recreation	Fishing	Salmon fishing on the Margaree and St. Mary's River are locally important to the tourism industry.	Yes.	Water quality may be impacted through forest operations. Mitigating impacts are currently addressed through stream crossing work instructions, riparian	Yes, as identified in Category 1 and Category 3.

General	*Value*	*Description*	*Known rare locations?*	*Threatened by current activities?*	*HCV?*
				regulations, watershed level clear cutting restrictions, and as identified under Category 1, Question 3 and Category 3, Question 12 of this assessment.	
Forests that Sustain Subsistence Agriculture	Not present.				

HCV Decision:

HCV's identified under this category are outlined in the above table.

10.0 CATEGORY 6: TRADITIONAL CULTURAL IDENTITY

Category 6: Cultural values. Sites, resources, habitats, and landscapes of global or national cultural, archaeological or historical significance, and/or of critical cultural, ecological, economic or religious/sacred importance for the traditional cultures of local communities or Indigenous Peoples, identified through engagement with these local communities or Indigenous Peoples.

Question 18.
Is the traditional cultural identity of the local community particularly tied to a specific forest area?

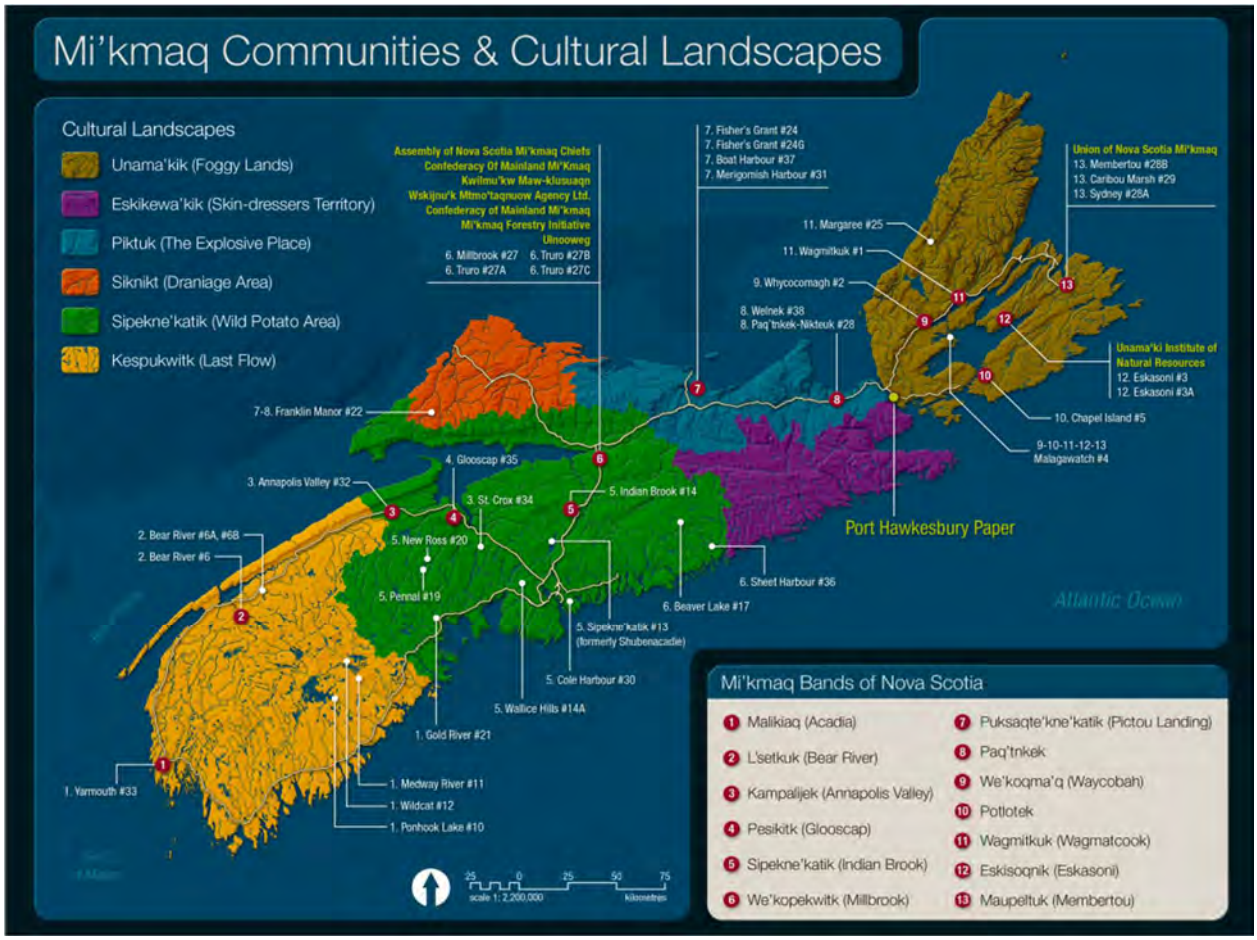
Rationale

NOTE: The word Mi'kmaq, (ending with a "Q") is a noun that means "the people." The word Mi'kmaw (ending with a "W") is a singular noun and refers to one person. It can also be used as an adjective (e.g. Mi'kmaw nation)

The Mi'kmaw Nation are the founding people of Nova Scotia and remain the predominant Aboriginal group within the province. Archaeological findings in central Nova Scotia have given evidence that the Mi'kmaw lived on traditional homeland at least 10,500 years ago (Union of Nova Scotia Indians et al. 1997). The pre-contact population is estimated at 35,000 to 70,000 people, and today it is estimated at approximately 13,500 (both on and off reserve) (www.gov.ns.ca/abor).

When the Mi'kmaq first encountered Europeans in the 16th and 17th centuries, their territory stretched from the southern portions of the Gaspé Peninsula eastward to most of modern-day New Brunswick, and all of Nova Scotia and Prince Edward Island. This area is known to Mi'kmaw people as Mi'kma'ki. Today, Nova Scotia has 13 Mi'kmaq First Nation communities. Seven are located within PHP's operating area. They are:

- Membertou First Nation
- Eskasoni First Nation
- Potlotek First Nation
- Wagmatcook First Nation
- We'koqma'q First Nation
- Paq'tnkek First Nation
- Pictou Landing First Nation



Prior to colonization, Mi'kmaw people were nomadic in nature and lived and travelled throughout Mi'kma'ki which supported their culture, traditions, and language. Today, this land still provides that link to their traditions (Union of Nova Scotia Indians 1997). PHP respects Aboriginal and treaty rights and will continue to comply with all legal requirements and land use decisions identified by the federal and provincial governments.

Methods

This attribute was assessed through several sources of information including:

- Nova Scotia Government Office of L'Nu Affairs
- The Assembly of Nova Scotia Mi'kmaq Chiefs and PHP Memorandum of Understanding
- Draft Impact & Benefit Agreement and Environmental Agreement between The Assembly of Nova Scotia Mi'kmaq Chiefs and PHP
- Port Hawkesbury Paper Sustainable Forest Management Long-term Plan
- Port Hawkesbury Paper Environmental Management System
- Port Hawkesbury Paper Dispute Resolution Policy
- Netukulimk GIS Management Project
- Awakening: Living With Today's Forestry
- Mi'kmaw Resource Guide
- Kekina'muek: Learning About the Mi'kmaq of Nova Scotia
- Mi'kmaq First Net – online site for Mi'kmaq resources in Nova Scotia

- Mi'kmaq and Maliseet Treaty Forum
- Consultation with Kwilmu'kw Maw-klusuaqn (KMKNO)
- Consultation with Unama'ki Institute of Natural Resources (UINR)
- Consultation with Confederacy of Mainland Mi'kmaq
- Consultation with Mi'kmaq Forestry Initiative

Results

The First Nations people of Nova Scotia are known as the Mi'kmaq. The history of the Mi'kmaq is very extensive and their original homeland was very large, stretching from Nova Scotia and Prince Edward Island to New Brunswick, Newfoundland and the Gaspe Peninsula (CMM 2007). The Mi'kmaw way of life was very much tied to the land and its surrounding resources. The people were seasonal in their movements and often lived in coastal areas during the warmer months and inland during the winter (CMM 2007). Travel routes were well-established and used year after year. The wide-bottomed canoe allowed the Mi'kmaq to canoe far out to sea as well as in shallow streams and even in rapids. Canoes were made of birch bark. The Mi'kmaq also made snowshoes and sleds for travel during the winter months (CMM 2007).

Reliance on wild flora and fauna for subsistence, values and experiences is an integral part of the First Nations traditional culture. Historically, the Mi'kmaq relied on the natural world for basic necessities such as housing, clothing, hunting and fishing gear, transportation, food, and medicine (Aboriginal Information Sheets - http://www.gov.ns.ca/abor/office).

Historical Values of Importance

Prior to European settlement in Nova Scotia, the Mi'kmaq moved with the seasons to fulfil their basic needs and cultural identity. To the Mi'kmaq, Mother Earth provided all the necessities for their survival and they held the utmost respect for the natural world. There are several examples of how the Mi'kmaq used the Earth's natural resources to meet their needs (CMM 2007). It is unclear how and if these uses are still relevant today for Mi'kmaw people.

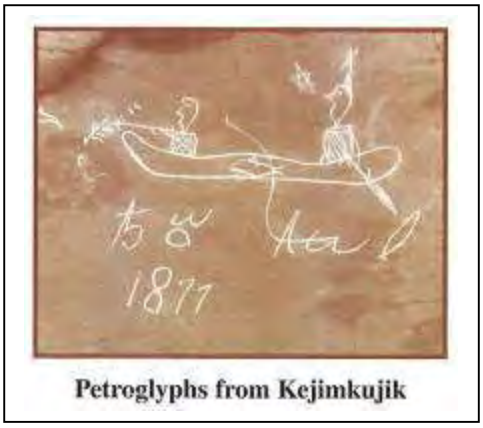
Table 13: Examples of Historical Natural Resource Use by Mi'kmaq

FOOD ▪ Fish, fowl, moose, deer, bear, beaver, etc. ▪ Berries of all kinds, apples, cherries, wild turnip ▪ Eggs from a variety of fowl	**MEDICINE** ▪ Turpentine from balsam fir – used to treat wounds ▪ Cold remedy – syrup of black cherry ▪ Porpoise oil – ear aches, a laxative
CLOTHING ▪ Skins of moose, deer, beaver, otter, bear, lynx ▪ Moose hide and deer hide moccasins ▪ Thread for sewing came from moose sinew ▪ Babies were wrapped in fox, swan and wild geese fur	**SPIRITUALITY & CEREMONY** ▪ Sage and sweet grass for cleansing and purification ▪ Tobacco offering
SHELTER	**CEREMONY**

▪ Fir boughs used on floor of wigwam ▪ Spruce ▪ Birch bark and moose/deer/caribou skin	▪ Pipes of willow wood and lobster claw were used in many ceremonies ▪ Willow bushes and birch bark were used to build traditional sweat lodges ▪ Red willow bark was smoked as a tobacco
TRANSPORTATION ▪ Birch bark canoes ▪ Cedar slats as ribs for canoes, fir and spruce roots for lacing and binding ▪ Snow shoes were first made of white ash, later of beech	**SPORTS** ▪ Hockey sticks from hornbeam roots ▪ Skates were made from long thin bones strapped by leather straps to the foot ▪ Sledding, snowshoes from beech and sinew
TOOLS AND UTENSILS ▪ Wooden tubs and kettles from tree trunks ▪ Birch bark vessels sewn together with cedar roots or black spruce roots and sealed with spruce gum ▪ Moose antlers and bones to make needles for sewing and fasteners ▪ Baskets from rushes, splints of cedar, juniper, spruce and other woods ▪ Smokehouses were built from poles and birch bark ▪ Fishing weirs from stone and boughs	**COMMUNICATION** ▪ Shells were used to record the stories and history of the Mi'kmaq on Wampum belts – the "official" recording device of the Mi'kmaw Grand Council
GAMES ▪ Waltes boards from burls of trees ▪ Dice and Waltes sticks made from bone of animals	**ART & DESIGN** ▪ Shells of varying sizes and colors were used for adornment ▪ Porcupine quills were used to decorate many items – dyed and sewn into skins, bark, etc. ▪ Bone, teeth, claws, feathers as decoration on a variety of items ▪ Moose hair weaving on clothing
MUSIC ▪ The drum was made from animal skin stretched taught over a wood rim and sewn with leather laces or sinew	**DYES** ▪ The inner bark of the birch tree was used to produce an orange dye ▪ Purple came from red cedar roots, red maple (inner bark) ▪ Brown – acorns, larch, white oak

Archaeological sites are another form of a Mi'kmaq value. Archaeology tells us about how and where people lived in the past, what was important to them economically or socially, and how certain people lived their lives based on their beliefs or the language spoken. There are more than 800 Mi'kmaw archaeological sites in Nova Scotia (CMM 2007). The most significant site in Nova Scotia is the Debert archaeological site, near Truro (not within PHP's operating area). Numerous living areas and a diverse set of stone artifacts were found on this site. Other archaeological digs occurred along the Mersey River in southwestern Nova Scotia. Here, more than 100 sites were found along the river that represented ancient camp and fishing areas. Also in southwestern Nova Scotia, Kejimkujik National Park is home to

over 500 individual pictures, or petroglyphs, that are carved into stone along lake shorelines and other areas (CMM 2007).



Petroglyphs from Kejimkujik

Source: Mi'kmaw Resource Guide, Union of Nova Scotia Indians 1997.

The following initiatives and programs implemented by PHP and/or the provincial government is described further below:

- PHP Crown license agreement with Government regarding Mi'kmaq use of agreement lands
- Community relationship building
- Mapping current values of importance
- Protection of cultural heritage and archaeological values
- Summary of Negotiations between PHP and Kwilmu'kw Maw-klusuaqn - KMKNO

PHP Crown License Agreement with Government regarding Mi'kmaq Use of Agreement Lands

In February 2023, PHP entered into its second 10-year Forest Utilization License Agreement with the provincial government. This agreement provides PHP with the right and responsibility to conduct all forestry activities in accordance with all approved forest management plans on the specified Crown lands under lease to PHP. This agreement outlines other uses of the lands by other users, including the Mi'kmaq people. Specifically, with respect to traditional activities and uses, it states:

> *Section 35 of the Constitution Act, 1982, protects the existing Aboriginal and Treaty Rights of the Mi'kmaq, and PHP agrees that it will:*
>
> *a) Provide the Mi'maq with continued access to the Agreement Lands for traditional activities (fishing, hunting, harvesting of wood for domestic purposes); and*
>
> *b) Protect known archaeological sites and implement measures to minimize risk in areas of high archaeological potential and Mi'kmaq culturally important sites with the Agreement Lands and provide the Mi'kmaq with continued access to those sites.*

PHP recognizes and respects the rights of the Mi'kmaq to access Agreement Lands for traditional activities, and strives to implement measures to minimize risk to areas of high archaeological potential through a governmental review process of planned forest management areas. PHP manages a public inquiry system that tracks all inquiries including requests by the Mi'kmaq to access an area or to acquire forest products for community use.

Community Relationship Building

PHP respects Indigenous values and perspectives as an integral part of its business. It desires strong, meaningful relationships with the Mi'kmaq of Nova Scotia and especially with the communities in Eastern Nova Scotia where engagement is more prevalent. PHP has embraced Etuaptmumk, the two-eyed seeing philosophy, as it seeks to continually improve both its understanding and interaction with both traditional and contemporary Indigenous knowledge and objectives, and increasingly incorporate Mi'kmaq perspective into its planning and operations. PHP strives to develop productive and mutually beneficial working relationships based on cooperation, trust, respect, fairness and understanding of each other's history, cultures, goals and interests.

PHP, and its predecessors, have a long and strong record of engagement and communications with Mi'kmaq, especially in Eastern Nova Scotia and aggregate associations such as the KMKNO, CMM, and UINR.

PHP acknowledges that as a part of its operations, the Government has formalized a Duty to Consult process to ensure meaningful consultation occurs with Mi'kmaq on specific projects such as PHP Wind's Goose Harbour Lake Wind Farm project. Through this process it is for the Province to "Consult" directly with the Mi'kmaq of Nova Scotia via KMKNO. Related to this process, both PHP and PHP Wind need to engage and communicate about projects providing a summary of activities to date as well as future plans. In additional to that, other Provincial Government Departments require PHP and PHP Wind to engage and keep accurate records of outreach requests and actual communications.

Our approach moving forward is to combine all key themes of interest (i.e. on key corporate updates, forestry, wind, land use management and any other special topics of interest) into a synergistic engagement endeavor.

PHP will lead the face-to-face engagement to ensure continuity, though we may call upon specialized consultants from time to time to assist. Some of these engagement activities may include:

- Continued engagement through the company's Public Advisory Committee
- Extend an offer to each community to host PHP in the fall of the year, to present updates on key corporate activities, forestry, wind, and any other special topics of interest.
- Issue a fall newsletter to all associations and communities.
- Invite each community and organization to the mill for presentation, a site tour, and two-way dialogue.

Mapping Current Values of Importance

Initiated in 1997, the Union of Nova Scotia Indians (UNSI) in cooperation with the Eskasoni Fish & Wildlife Commission (EFWC) developed a geo-referenced data base mapping project on Cape Breton Island, utilizing GIS technology, to integrate community planning activities with the community's Traditional Environmental Knowledge (TEK). The Netukulimk GIS Management Project developed an inventory which identified important medicinal plants, trees, berries, fish, shellfish, birds and mammals within each First Nation community on Cape Breton Island. PHP was a funding partner in the project

and was provided with a report that illustrated the inventory within each community. The GIS data was not provided to the company as decided by the project participants.

Both terrestrial and aquatic life provided several plants that were used for medicinal purposes by Mi'kmaq people. It is unclear if these medicinal plants are still being used today in any significant way by Mi'kmaq people. Clarification of this will require willing participation by local First Nations communities with the company to identify critically important medicinal plants and areas of on-the-ground significance.

Table 14: Mi'kmaq Medicinal Plants

Medicinal Plant Species with Mi'kmaq Name	
Labrador Tea – Pituistiki'ju'jit	White Birch – Maskwi
Pitcher Plant – Mqo'oqewi'k	Yellow Birch – Nimnoqn
Sphagnum Moss – Pesaqnatkw	High Bush Cranberry – Nipmann
Sweet Grass – Switte'	Blackberries – Ajioqimink
Golden Thread – Wisawtaqji'jkl	Bayberry Bush – Kljikmanaqsi
Spearmint – Plamuipkl	Blueberries – Pkwimann
Cow Parsnip – Pako'si	Gooseberries – Apaqtejkl
T Berry – Kakaaqwejowumann	Plantain – Ansalewipk
Flagroot – Ki'kwesu'skl	Strawberries – Atuomkmink
Balsam Fir – Stoqn	Raspberries – Klitaq
Black or Bog Spruce – Kawatk (Maqtewe'k)	Bunchberries – Plaweju'manaqsi
Ground Juniper – Apatamkiejit (Kinikwejitewaqsi)	Sarsaparilla – Wapapaqji'jkl
White Spruce – Kawatk (Wape'k)	Cudweed – Wekaytaskji'jl
Poplar – Miti	Alder – Tupsi
Sugar or Rock Maple – Snawey Pearly – Everlasting	Pin-Cherry Tree – Maskwe'smanaqsi

Source: Netukulimk GIS Management Project


Flagroot - used to make traditional medicines.

Also identified in this project were fish, shellfish, birds and mammals of importance to Mi'kmaq people:

- Fish – cod, herring, trout, gaspereau, mackerel, smelt, eels, flounder, salmon, perch
- Shellfish – rock crabs, oysters, mussels, clams, sea urchin
- Birds – eagles, Canadian geese, crow, black ducks, loons, partridge, cormorant, heron, owl, blue jay
- Mammals – deer, fox, moose, muskrat, coyote, bear, beaver, racoon, rabbit, otter, mink

Distribution of Culturally Significant Plants – Joint Project between PHP, Unama'ki Institute of Natural Resources, and Cape Breton Highlands National Park

For millennia First Nations people have used wild plants as foods, as medicines, as materials for constructing tools and shelter and for ceremonial uses. Knowledge of these plants – which ones are useful for what and where they have traditionally been gathered – is held by elders in the five Unama'ki communities. The Unama'ki Institute of Natural Resources (UINR) has an interest in documenting this knowledge so that traditionally important plant species can be preserved in Unama'ki for future generations.

The intent of this project was to identify and catalogue plant species of cultural significance to the Mi'kmaq people of Unama'ki and document their known occurrences by locality and habitat such that other areas of Unama'ki can be efficiently assessed for potential occurrence. UINR, on behalf of the participating elders, will retain all control over the content that is to be released to PHP by supplying only the consensual knowledge as determined by the participants at the time of its gathering. For confidentiality reasons, a map showing the culturally significant plant areas is not provided in this report.

Protection of Cultural Heritage and Archaeological Values

Management of the Crown license area by PHP requires different stages of forest management planning. Forest planning and reporting procedures to the provincial government require submission of a long-term sustainable forest management plan (100+ years), a 20-year spatial and temporal plan, and a 5-year annual rolling plan for proposed harvest, silviculture and road building activities. These plans directly support each other and all require approval by the provincial government. Stand level forest management plans are also submitted throughout the year for review and approval, and includes an Integrated Resource Management (IRM) scan by the provincial government.

IRM's general principles include environmental responsibility, inclusiveness, maintenance of biodiversity, multiple use, optimization of social and economical benefits of resource use, and

sustainability (https://novascotia.ca/natr/wildlife/conserva/nr-irm-crown-land-planning.asp). As PHP submits its 5-year annual rolling plan and stand level plans to government, an IRM scan is conducted by the NSDNRR to assess whether there are other values of significance, including Mi'kmaq cultural and archaeological sites. Due the confidentiality of the information, PHP is not provided with a spatial or detailed list of overlapping sites on the planned forest management areas. However, the government applies restrictions and/or protections as required through the approval process to PHP to ensure risk is minimized to those important values.

Summary of Negotiations between PHP and Kwilmu'kw Maw-klusuaqn - KMKNO

In early 2012, PHP and the provincial government initiated discussions with The Assembly of Nova Scotia Mi'kmaq Chiefs to create a Memorandum of Understanding that would support the development of an Impact Benefit Agreement. These agreements would benefit all 13 First Nations in Nova Scotia (seven are within PHP's forest management area). The Memorandum of Understanding was signed in October 2012 by all 13 Mi'kmaq Chiefs of Nova Scotia. The intent of an Impact Benefit Agreement is to provide employment opportunities, education and training, research, and identification and management of heritage resources such as archaeology and traditional use. Since 2015, PHP has honored the spirit of the Memorandum of Understanding and draft Impact Benefit Agreement.

Since 2021, PHP has also worked with KMKNO on the development of an Umbrella Framework Agreement. The general purpose of this agreement is to set forth the commitment and mutual interest to collaborate on projects to the benefit of both parties. The parties wish to continue building and sustaining positive, mutually beneficial relationships and partnerships between the Nova Scotia Mi'kmaq, Mi'kmaq organizations, and PHP. The Umbrella Framework Agreement outlines a series of initiatives that both parties wish to undertake together for the long-term sustainability of valued resources. PHP is also committed to maintaining the continued success of its forest certification to the Forest Stewardship Council® (FSC®) National Forest Stewardship Standard of Canada, which includes a Free Prior Informed Consent (FPIC) Process. FPIC is a key initiative that will support other areas of collaboration outlined in the agreement, which may lead to more specific project agreements in the future.

HCV Decision:

The following are classified as HCVs because of their profound cultural and historical relevance to communities as well as their natural heritage assets:

- All cultural and archaeological known sites identified through the approval process with the government are considered HCVs.

- Plant areas identified by UINR as culturally significant for traditional use are considered HCV's.

Management Approach:

The known cultural, archaeological, and significant plant sites are managed, protected, or conserved according to provincial government restrictions and/or collaboration between PHP and the Mi'kmaq on appropriate management.

Collective Overlap of High Conservation Values

Question 19.
Is there a significant overlap of values (ecological and/or cultural) that individually did not meet HCV thresholds, but collectively constitute HCVs?

Given the extensive and comprehensive review of all possible HCV's on the landscape, there is no apparent significant overlap of values that would lead to new HCV's.

APPENDIX A – HCV METHODOLOGY

Data Collection & Analysis

A variety of data were collected from several sources including PHP's policies and procedures, the original source or through past and existing conservation planning projects (e.g. Colin Stewart Forest Forum) to complete the HCV assessment. Data used or available for use in the assessment include:

- Provincial data available from Nova Scotia Department of Natural Resources and Renewables (NSDNRR) and Nova Scotia Environment (NSE):
  - Forest inventory
  - Road and utility corridors
  - Hydrology
  - Property Ownership
  - Wetlands
  - Significant Old/Unique Forests
  - Significant Ecosites
  - Habitats of Rare/Vulnerable Species
  - Significant Habitats
  - Old Forests
  - Climax-dominated Forests
  - Natural disturbance and patch
  - Wilderness Areas
  - Nature Reserves
  - Sites of Ecological Significance
  - Natural Landscapes of Nova Scotia
  - Preliminary Ecounits
  - Integrated Resource Management Land-use (C1, C2, C3)
  - Restricted Land-Use Layers
    - All Parks (provincial, national)
    - National Wildlife Management Areas
    - Provincial Game Sanctuaries
    - Provincial Wildlife Management Areas
    - National Historic Sites
    - National Wildlife Sanctuaries
    - International Biological Programme (IBP) Sites
    - Designated & Non-Designated Water Supply Areas
    - Ramsar Wetland Sites
    - Canadian Heritage Rivers
- Northern Appalachian/Acadian Ecoregion Assessment (Nature Conservancy Canada)
  - Matrix Forest Blocks
  - Portfolio Occurrences (floodplains, ravines, summits, steep slopes, wetbasins)
- Other Data
  - PHP's Environmental Management System and Forest Certification Documentation

- PHP's Historical Treatment Data
- Landsat 5 and 7 satellite imagery from late summer 2005, and other years going back to the late 1980s
- Digital Elevation Model for Nova Scotia
- Atlantic Canada Conservation Data Centre Element Occurrence
- Colin Stewart Forest Forum Large Natural Patches
- Cold water refugia areas for Salmon and Brook Trout (Federal Department of Fisheries and Oceans)
- Important Bird Areas

❖ Other Potential Data Sources through Internet

- Global/International Data
  - CITES (Appendix I, II and III)
  - IUCN Red Data List
  - Conservation International Hotspot Areas
  - Global Forest Watch Canada

- National Data
  - International Bird Areas of Canada
  - WWF Ecoregion Conservation Assessment
  - Atlas of Canada Endemic Plant Diversity
  - NatureServe
  - USGS Trees of North America
  - WWF Canada Nature Audit
  - Canadian Conservation Areas Database
  - WWF Enduring Features
  - Ducks Unlimited Canada
  - Canadian Soil Information System

- Provincial Data
  - Maritimes Breeding Bird Atlas

For HCV categories 1, 2, and 3 in particular, the ArcGIS® platform was used and a series of questions were posed to begin the HCV analysis to better understand general characteristics of the data. These questions were:

- Is the feature on PHP lands?
- Is the feature impacted by forest management activities?
- Is the feature rare?
- What proportion is on PHP lands compared to province?
- What amount is currently protected or specially managed by PHP?

For several years, ecological and habitat values have been identified on PHP lands either through the provincial government or the company itself. As the company's long-term planning system is landscape-

based, the ecological planning unit (EPU[4]) is the primary attribute in PHP's forest modelling to balance between the attributes necessary to accurately predict growth and yield, and those necessary for managing other values. Many decisions, actions and responses are dependent on the EPU, thus allowing the company to model the forest in a manner that reflects ecological and societal rather than purely logistical or economic realities. During the HCV assessment process, several of these ecological and societal values have been identified as high conservation values. Values that PHP currently manages for include:

- Steep Slopes
- Marten Habitat Management Zones
- Canada Lynx Management Zones
- Boreal Felt Lichen Predicted Habitat
- Connectivity Management Zones
- Viewsheds
- Recreation Areas
- Significant Watersheds (where PHP is predominant land manager and/or municipal watershed areas in PHP's DFA)
- Old Forest Areas

[4] An EPU (or Ecoregion) is mapped at a scale of 1:500,000 and are subdivisions of the larger Acadian ecozone and express macroclimate as a distinctive ecological response to climate through soils and vegetation (Neily et al. 2003).

APPENDIX B – HCV CONSULTATION PROCESS

In January 2007, a HCV Design Committee was formed to assist the company (at that time called Stora Enso Port Hawkesbury) with the completion of a High Conservation Value Forest (HCV) Assessment for Forest Stewardship Council (FSC) certification. This Committee completed the assessment for categories 1, 2 and 3. The HCV Design Committee members included:

- Karen Beazley, Dalhousie University
- David McCorquodale, University of Cape Breton
- Chris Miller, Canadian Parks & Wilderness Society
- Craig Smith, Canadian Parks & Wilderness Society
- Kermit deGooyer, Ecology Action Centre
- Raymond Plourde, Ecology Action Centre
- Rob Cameron, Nova Scotia Environment
- Dave MacKinnon, Nova Scotia Environment
- Bruce Stewart, NS Department of Natural Resources and Renewables
- Mark Pulsifer, NS Department of Natural Resources and Renewables
- Philip Greyson, Nature Conservancy of Canada
- Tony Iacobelli, World Wildlife Fund
- Russ Waycott, Stora Enso Port Hawkesbury
- Kari Easthouse, Stora Enso Port Hawkesbury
- Andrea Doucette, Stora Enso Port Hawkesbury
- Steven Delorey, Stora Enso Port Hawkesbury
- James Duggan, Stora Enso Port Hawkesbury

The HCV Design Committee worked collaboratively on Categories 1, 2, and 3 of the HCV assessment, as the expertise of the committee was conservation planning, ecology, and biology. HCV categories 4, 5 and 6 are associated with societal and community values, which were researched and written by Andrea Doucette (PHP) with consultation by various organizations and individuals, including the following:

- Charlie McInnis, Fisheries and Oceans Canada
- Cheryl Benjamin, NS Department of Environment
- John MacMillan, NS Department of Fisheries and Aquaculture
- Dan Gillis, Ashley Williams, Karen McNulty, Carmel Avery-MacDonald, Guysborough Regional Development Authority
- Blaine Gillis, Strait-Highlands Regional Development Authority
- Ashley Bouchie, Alisha Grant, Antigonish Regional Development Authority
- Gerald Gabriel, Pictou Regional Development Commission
- Cindy Tobin, Cape Breton County Economic Development Authority
- Lisa Paul, Unama'ki Institute of Natural Resources
- Jason Googoo, Membertou First Nation
- James Bridgeland, Cape Breton Highlands National Park
- PHP Forest Advisory Committee members

The HCV assessment was finalized in 2010 and identified values for categories 1 through 6 with corresponding management and monitoring activities.

A peer review of the 2010 HCV report was completed by:

- Ronnie Drever, Forest Ecologist – The Nature Conservancy in Canada (HCV 1 – 6)
- Rike Burkhardt, Forest Ecologist – Consultant (HCV 1 – 6)
- Tony Iacobelli, Director Forests and Freshwater Conservation – World Wildlife Fund (HCV 1 – 3)
- Tom Clark, Ecologist – Consultant (HCV 1 – 3)

In 2014, PHP began an internal review of the 2010 HCV Assessment Report to ensure that identified HCV's were still relevant and to capture any new HCV's (e.g. newly listed species at risk). Significant updates were also made to the HCV category of large landscape level forests to capture work that was completed by the provincial government for a new protected areas plan for the province. A HCV Review Committee was formed to assist the company with updating HCV Category 2 and included the following members:

- Chris Miller, Canadian Parks & Wilderness Society
- Matt Miller, Ecology Action Centre
- Bruce Stewart, NS Department of Natural Resources and Renewables - Forestry
- Allan Smith, NS Department of Natural Resources and Renewables - Forestry
- Randy Milton, NS Department of Natural Resources and Renewables – Wildlife
- Graham Forbes, University of New Brunswick, Faculty of Forestry & Environmental Management
- Derek Geldart, Port Hawkesbury Paper
- Andrea Doucette, Port Hawkesbury Paper
- Joel Taylor, Port Hawkesbury Paper
- Andrew Fedora, Port Hawkesbury Paper

Updates that were made by PHP in other sections of the report were consulted on by experts specific to those fields (see Appendix B).

A peer review of the new 2015-2020 HCV Assessment Report was completed by:

- Ronnie Drever, Forest Ecologist – The Nature Conservancy in Canada
- Tom Clark, Ecologist – Consultant

APPENDIX C - SUMMARY OF CHANGES FOR 2015-2020 FSC CERTIFICATION PERIOD

A thorough review of the 2010 HCV assessment was completed and the below table is a summary of changes and consultations made for the new 2015-2020 HCV assessment report.

Summary of Changes to 2010 HCV Assessment HCV's

HIGH CONSERVATION VALUE	SUMMARY OF CHANGE	CONSULTATION
Category 1 – Biodiversity **Question 1 – Species at Risk**		
Piping Plover	Removed as HCV since the Piping Plover is a shorebird that is found along rocky or sandy beaches and shorelines, and therefore not impacted by PHP's forest management activities.	Not applicable
Gaspe Shrew	Gaspe Shrew was identified as a HCV in 2010 as it was a listed species at risk. Since then, the Gaspe Shrew has been de-listed and is no longer a species at risk nationally or provincially. Furthermore, the habitat requirements of the Gaspe Shrew is rock outcrops and talus slopes, where PHP does not operate.	National and Nova Scotia Species at Risk websites
Wood Turtle Habitat	The management approach for Wood Turtle was modified to meet the new requirements in the provincial Special Management Practices Policy released in 2012.	Nova Scotia Department of Natural Resources and Renewables, Wildlife Division
Boreal Felt Lichen Occurrences	The management approach for Boreal Felt Lichen was modified to meet the new requirements in the provincial Special Management Practices Policy released in 2012.	Nova Scotia Department of Natural Resources and Renewables, Wildlife Division
American Marten Habitat	The management approach for American Marten was modified to meet the new requirements in the provincial Special	Nova Scotia Department of Natural Resources and Renewables, Wildlife Division

HIGH CONSERVATION VALUE	SUMMARY OF CHANGE	CONSULTATION
	Management Practices Policy released in 2012.	
Mainland Moose Habitat	The management approach for Mainland Moose was modified to meet the new requirements in the provincial Special Management Practices Policy released in 2012.	Nova Scotia Department of Natural Resources and Renewables, Wildlife Division
Canada Lynx Habitat	The management approach for Canada Lynx was modified to meet the new requirements in the provincial Special Management Practices Policy released in 2012.	Nova Scotia Department of Natural Resources and Renewables, Wildlife Division
Bicknell's Thrush Habitat	The management approach for Bicknell's Thrush was modified to meet new requirements developed between Bird Studies Canada and PHP in 2012.	Bird Studies Canada - Becky Stewart, Atlantic Program Manager
Olive-sided Flycatcher Habitat	Added as new HCV as it was listed as a new species at risk in 2013.	Bird Studies Canada – Greg Campbell, Senior Project Biologist
Eastern Whip-poor-will Habitat	Added as new HCV as it was listed as a new species at risk in 2013.	Bird Studies Canada – Greg Campbell, Senior Project Biologist
Eastern Wood Peewee Habitat	Added as new HCV as it was listed as a new species at risk in 2013.	Bird Studies Canada – Greg Campbell, Senior Project Biologist
Canada Warbler Habitat	Added as new HCV as it was listed as a new species at risk in 2013.	Bird Studies Canada – Greg Campbell, Senior Project Biologist
Vole Ears Lichen Occurrences	Added as new HCV as it was listed as a new species at risk in 2013.	Nova Scotia Environment – Rob Cameron, Ecologist
Blue Felt Lichen Occurrences	Added as new HCV as it was listed as a new species at risk in 2013.	Nova Scotia Environment – Rob Cameron, Ecologist
Black Ash	Added as new HCV as it was listed as a new species at risk in 2013.	Nova Scotia Department of Natural Resources and Renewables – Frances

HIGH CONSERVATION VALUE	SUMMARY OF CHANGE	CONSULTATION
		MacKinnon, Wildlife GIS Analyst
Category 1 – Biodiversity **Question 2 – Endemic Species**		
No changes made under Question 2		
Category 1 – Biodiversity **Question 3 – Seasonal Concentration of Species**		
Cold Water Refugia Sub-watersheds	Modified the original GIS 'freehand' boundaries from the 2010 HCV assessment to a GIS-based buffer width of 200 meters for all cold water refugia sub-watersheds. The management prescription remains the same (minimum 50% crown closure at the forest stand level unless the stand is non-windfirm (e.g. balsam fir)). Also added that the 20 meter legislated riparian buffers (which allow for some extraction) would be left as un-managed forest areas to provide for additional protection for cold water streams.	Nova Scotia Fisheries & Aquaculture – Jason LeBlanc, Fisheries Biologist
Category 1 – Biodiversity **Question 4 – Regionally Significant Species**		
Red Spruce	In the 2010 HCV assessment report, there was one red spruce stand in Cape Breton showing in the GIS inventory. At that time, the company established this stand as a protected area. In early 2014 during regular forest planning, it was confirmed that the area is actually a balsam fir/white spruce plantation that was planted in 1984 and was later spaced. The area was ground-checked by the forest planner, area supervisor, and a Crown land forester with the NS Department of Natural Resources and Renewables to verify that this stand was	Port Hawkesbury Paper – Dennis Boulet, Cape Breton Regional Planner Nova Scotia Department of Natural Resources and Renewables – Brian MacSween, Crown Land Forester

HIGH CONSERVATION VALUE	SUMMARY OF CHANGE	CONSULTATION
	a plantation of balsam fir and white spruce, and not a natural red spruce stand. Therefore, this particular forest stand is removed as a HCV.	
Category 1 – Biodiversity **Question 5 – Species Concentration at Edge of Natural Range**		
	No changes made under Question 5	
Category 1 – Biodiversity **Question 6 – Legal or Proposed Conservation Area**		
Legal and Administrative Protected Area	This section was updated to include 98,184 hectares of new provincial protected areas (pending legal protection) and 6,147 hectares of new administrative protected areas identified by PHP.	2014/15 HCV Review Committee <u>Members</u> - Canadian Parks & Wilderness Society, Chris Miller - Ecology Action Centre, Matt Miller - NS Department of Natural Resources and Renewables - Forestry, Bruce Stewart - NS Department of Natural Resources and Renewables - Forestry, Allan Smith - NS Department of Natural Resources and Renewables – Wildlife, Randy Milton - University of New Brunswick, Graham Forbes
Category 2 – Large Landscape Level Forests **Question 7 – Forest Landscapes for Native Species**		

HIGH CONSERVATION VALUE	SUMMARY OF CHANGE	CONSULTATION
Large Landscape Level Forests	This section was updated to reflect new information resulting from the completion of the provincial protected areas planning process.	2014/15 HCV Review Committee
Category 3 – Rare, Threatened or Endangered Ecosystems **Question 8 – Naturally Rare Ecosystem Types**		
No changes made under Question 8		
Category 3 – Rare, Threatened or Endangered Ecosystems **Question 9 – Ecosystems under Present and/or Future Decline**		
No changes made under Question 9		
Category 3 – Rare, Threatened or Endangered Ecosystems **Question 10 – Ecosystems Poorly Represented in Protected Areas**		
PHP Administrative Protected Areas	This section was updated to reflect new information resulting from PHP's ecological gap analysis and the identification of new administrative protected areas.	2014/15 HCV Review Committee PHP Gap Analysis
Category 3 – Rare, Threatened or Endangered Ecosystems **Question 11 – Rare or Absent Large Landscape Level Forests**		
Large Landscape Level Forests	This section was updated to reflect the HCV assessment completed for large landscape level forests under Category 2.	2014/15 HCV Review Committee
Category 3 – Rare, Threatened or Endangered Ecosystems **Question 12 – Unique Aquatic Ecosystems**		

HIGH CONSERVATION VALUE	SUMMARY OF CHANGE	CONSULTATION
	No changes made under Question 12	
	Category 4 – Basic Services of Nature **Question 13 – Water Flows for Social & Economic Activities**	
	No changes made under Question 13	
	Category 4 – Basic Services of Nature **Question 14 – Significant Forests Providing Aquatic Ecological Services**	
	No changes made under Question 14	
	Category 4 – Basic Services of Nature **Question 15 – Forests Critical to Erosion Control**	
	No changes made under Question 15	
	Category 4 – Basic Services of Nature **Question 16 – Interface Forests for Fire Protection**	
	No changes made under Question 16	
	Category 5 – Basic Needs of Local Communities **Question 17 – Basic Needs / Livelihoods of Local Communities**	
PHP Middle River Freehold Protected Area	In the 2010 HCV Assessment Report, PHP (then New Page Port Hawkesbury) identified a property owned by the company as a protected area and maintained a life-time easement with the adjacent property owner for domestic water supply access. When PHP	Not applicable

HIGH CONSERVATION VALUE	SUMMARY OF CHANGE	CONSULTATION
	purchased the mill from New Page in 2012, all company owned properties were sold to the provincial government. The life-time easement for the Middle River property was transferred to the government at that time, so PHP no longer has responsibility for this property, and is therefore removed as a HCV.	
Category 6 – Traditional Cultural Identity **Question 18 – Forest Areas for Traditional Cultural Identity**		
Areas for Traditional Cultural Identity	Category 6 was updated to include progress that has been made since 2012 between PHP and The Assembly of Nova Scotia Mi'kmaq Chiefs. In fall 2012, a Memorandum of Understanding was signed between the two parties for the development of an Impact & Benefit Agreement, and an Environmental Agreement. These agreements are still under development and once signed, activities will begin for the identification and management of heritage resources such as archaeology and traditional use	Negotiations between PHP and The Assembly of Nova Scotia Mi'kmaq Chiefs (meeting minutes, MOU, draft agreements)

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