PORT HAWKESBURY
PAPER

ANNUAL MONITORING REPORT

A Progress Report on Safety, Environmental, and
Responsible Forest Management Activities

20 — 23

PORT HAWKESBURY PAPER - WOODLANDS

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Introduction

Port Hawkesbury Paper's (PHP) Defined Forest Area (DFA) is in the seven eastern counties of Nova Scotia. The geographic extent of the DFA is shown below. The company manages approximately 520,000 hectares of Crown land through a license agreement with the provincial government within the DFA.

In addition to acquiring wood from PHP Crown license 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.

The public use of Crown lands for First Nations, recreation, accessibility, hunting and fishing, to name a few, illustrates the wide variety of values held by the general public. The implementation of a monitoring program provides an opportunity for PHP to assess its actions on these multiple values to ensure the needs of all natural environments and stakeholders are managed appropriately.

PHP Crown License Area

- PHP Protected Area (HCVF)
- Crown Wilderness Area
- PHP Crown License Lands (FULA)
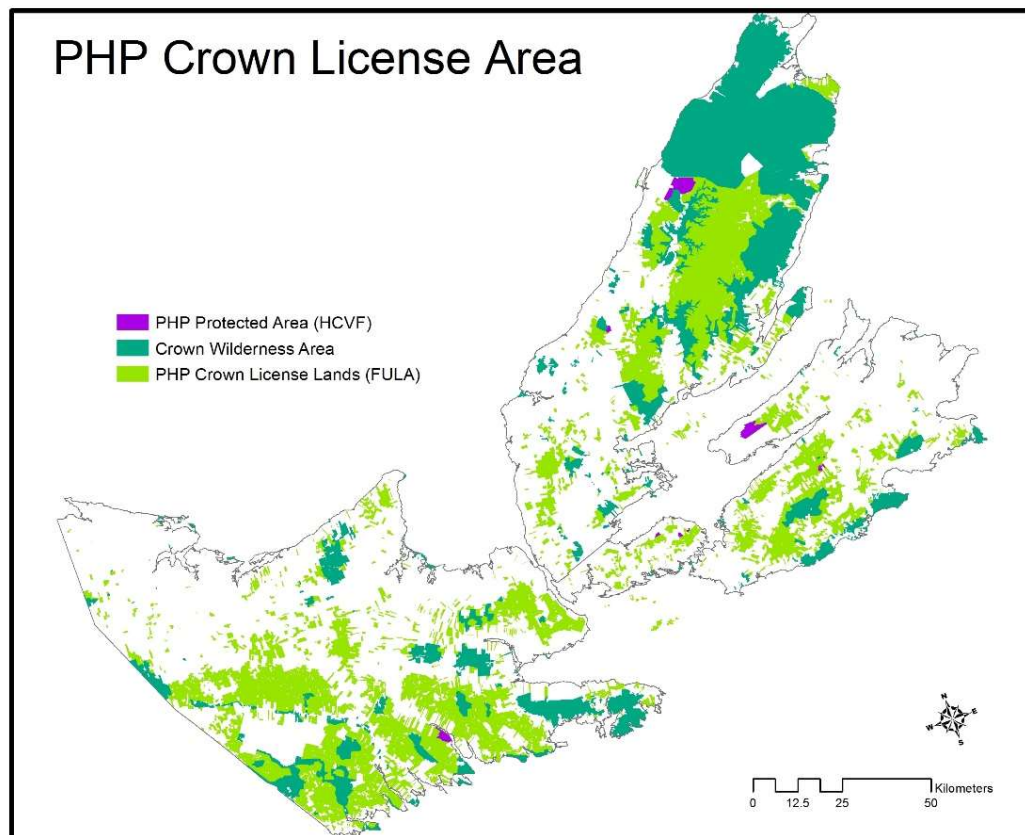
Key Commitments to Safety

Woodlands Safety Results

The Woodlands Safety Results show a strong trend towards zero lost time accidents and medical aids. We continue to promote employee and worker safety through effective training programs, monitoring, and communication to strive towards our objective of zero safety incidents year after year.
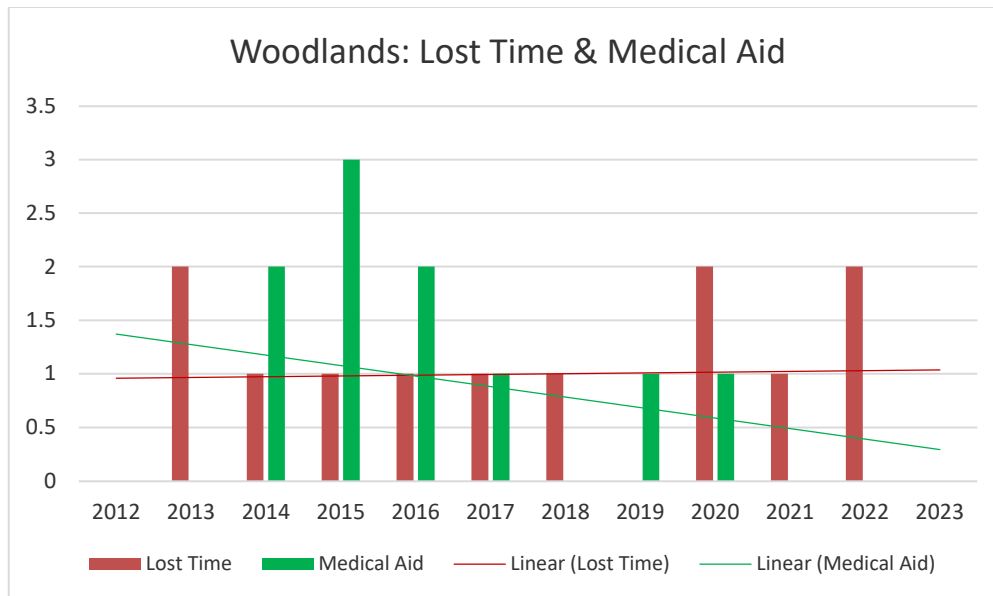
A Lost Time Accident occurs when an employee or worker is injured on the job which results in lost work time. There were no lost-time accidents in 2023.

A Medical Aid occurs when an employee or worker is injured on the job and requires medical aid but did not result in lost work time. No medical aids occurred in 2023.

Key Commitments to the Environment

Monitoring and reporting on Woodlands environmental performance is an integral part of achieving responsible forest management across the working landscape. Harvest contractors working on Crown land on behalf of the company are audited by PHP three times a year - Winter, Spring/Summer and Fall. The NS Department of Natural Resources & Renewables (DNRR) also conduct their own Crown land audits of PHP operations. Compliance and performance are checked against a range of items related to layout compliance, operational safety and environmental compliance, and job quality. Where deficiencies are found, an incident or violation report is written. Refresher training is provided by PHP staff if needed, and follow-up actions to address issue are completed by contractor.

Below are summaries of PHP's Crown and private supplier audit program for 2023. Areas of deficiencies that are consistently on-going or deemed to be of significant concern, communications and/or training is provided to suppliers to improve performance.

PHP Contractor Audits on Licensed Crown Land

Audit Requirement	Percent Within Compliance
WEEKLY INSPECTIONS COMPLETED ACCURATELY	100
Work Site (Layout Compliance)	100
Work/Approval Instructions Understood & Followed	95
Worked within Cutting/Property Boundaries	100
Wildlife Clumps	100
Wildlife Corridors	100
Properly Buffered Watercourses and Wetlands	95
Qualified Logging Professional Part of Operation / at Work Site Regularly	90
Each Machine to have Personal (Type 1) First Aid Kit	95
Qualified First-aider on Work Site:	100
Is there a Safety Representative?	100
Working Alone Policy Documented	95
Remote Location Plan	100
Emergency Response Plan Procedures in Place	90
Safety Policy Documented, Signed, Dated within the Last Year	95
Copy of Occupational Health and Safety Act Available at the Work Site	100
MSDS Available at the Work Site	100
OHS Compliant Safety System at the Work Site	100
PHP Policies & Work Instructions at the Work Site	100
Proper Warning Signs Posted on 2-way Public Traffic Road	95
"NO HUNTING" Signs Posted	100
All Personnel have Appropriate Forest Firefighting Equipment	100
All Machines have Fire Suppression Equipment	85
Lock-out Procedure Documentation	95
1. De-energize the machine	100
2. Lock-out sources of ignition	100
3. Secure lock-out tag	100
4. Test lock-out	100
5. Notify when lock-out procedure has been completed	100
All guards, screens and other safety devices in working order on heavy equipment	100
No visible signs of leaking oil/fuel	95
Absorbent snake on all forwarders, pads on all other machines	95
Maintenance done on level ground with minimal surface runoff and >30m from watercourses	100
Spill kit is on-site and well maintained	95
Pumps and fuel locked and secure	95
Fuel/Oil handling procedures followed	100
WHMIS training	95
TDG training (>= 2000 L)	95
Central collection spot for hazardous material	100
Waste oil disposal system in place	100

Audit Requirement	Percent Within Compliance
Tanks properly labelled	100
Lock (for lock-out)	100
Clean & Tidy	95
Securing Items	100
First Aid Kit	100
Fire Extinguisher	100
Welders, Generators and any other Internal Combustion engine(s) vented	100
Working Carbon Monoxide (CO) Detector	95
Bridges Used and Erosion Controlled	95
Temporary Bridges Removed and Water Courses Cleared of Debris	100
No Evidence of Siltation	100
Machine Rutting	95
Ground Disturbance	100
Harvested Merchantable Trees Utilized	100
Harvest meets Mapped/Operating Plan/Prescription Requirements	95
Unmerchantable Hardwood Trees Protected	100
Damage to Leave Trees Acceptable	100
Road Drains and Culverts Cleared of Debris	100
Road Surface in Good Condition	100
Disposal of Hazardous Materials	100
Garbage, Trash, Litter to be Collected and Discarded	100
Safety Meeting Minutes	100
Training - New Employees	95
Critical Wildlife Habitat Elements, Biodiversity & Species at Risk	100
Forests with Exceptional Conservation Value	100
Invasive Exotic Plants and Animals	100
Species Sites Preserved	100
Special Management Zone(s)	100
Machine Exlusion Zone(s)	95
Boundary Line(s)	100
Sensitive Species/Habitat(s)	100
Corridors	100
Recreational Trails/Portages	100
Quality Regeneration	100
Roadside Wood Piled >30m from Watercourse(s)	100
Safety NCR(s)	100
Environmental NCR(s)	100
Operating Plan Map & Work/Approval Instructions On Site	95
No. 3 First Aid Kit(s) on Work Site	100
CSA Approved Hard Hat	100
CSA Approved Grade 2 Boots	100
Eye Protection	100
High Visibility Clothing	97

Audit Requirement	Percent Within Compliance
Hearing Protection	100
Seatbelts Worn	97
Class I Machine	100
Class II Machine with on board suppression system	100
Class II Machine without an on board suppression system	100
Class II Machine requires:	100
Class II Machine recommended:	100
All fire extinguishers require proof of inspection within the last year	97
Tank capacity indicated on fuel tanks	93
Shut-off valve on fuel tank, automatic shut-off nozzle on hose, and nozzle holding device	96
Fuel nozzle drip catcher with drain valve to prevent overflow/spillage	93
Tanks < 450 litres with capacity and product identification labels	100
Tanks >= 450 litres with capacity and product identification labels and certification stamp	100
Tanks >= 2000 litres placarded and with manifest for transport	100
All fuel trailers towed on public roads safety inspected and registered	92
Fuel tanks & service units > 30m from watercourses	100
Watercourse Crossing(s)	95

DNRR Audits of PHP Harvest Operations

Audit Requirement	Percent Within Compliance
DNRR Harvest Prescription Standards followed	100
Operators aware of work instructions	100
Approved area has been treated as per prescription	100
All processed wood brought to roadside	100
Roadside wood piled >30m from watercourse(s)	98
Trail/Portages	100
Heritage/Culture sites	100
Nesting Sites	100
Sensitive Species and/or Habitat	100
Riparian Zone	100
Watercourse > 50cm width	98
Watercourse < 50cm width	98
Temporary Crossing	100
Soil Disturbance	98
Handling of Fuel/Oil	100
Boundary Lines	100
Garbage Disposal	100
Road/Culverts	96
Wildlife Clumps	100
Permanent Reserve Trees	100
Corridors	100
Clumps are 20-200m apart	100
Openings in SMZ not greater than 15m	100
Less than 25% of the area in Trails	100
Basal Area within prescription tolerance	100
Minimum requirements met for Permanent Reserve Trees	100
Less than 10% of the stand BA damaged.	100
Increased AGS	96
Increased LIT	98

DNRR Audits of PHP Silviculture Operations

Audit Requirement	Percent Within Compliance
Approved Treatment Area Followed	100
NRR silviculture prescription standards followed	100
Operators aware of work instructions	100
Department Standards	100
Handling of Fuel/Oil	100
Garbage Disposal	100
Riparian Zone	100
Machine Exclusion Zone	100
Temporary Crossing	100
Boundary Line	100
Nesting Site	100
Sensitive Species Habitat	100
Trails/Portages	100
Heritage/Cultural Site	100
Microsite Quality	100
Site Coverage	100
Creation of Microsite	100
Wildlife Clumps	100
Cavity Trees	100
Coverage of Site	100
Soil Disturbance	100
Crop Tree Selection Quality	100
Roadway and Ditches brush free	100
Plot Location Mapped	92.65
Safety Trails adequate and marked	100
Coverage of Site	100
Percent Quality (%)	100
Quality	100
New forest worker/s trained	100

PHP Audits of Private Suppliers

Audit Requirement	Percent Within Compliance
Worked within Cutting/Property Boundaries	100
Wildlife Clumps	100
Wildlife Corridors	100
Properly Buffered Watercourses and Wetlands	93
Maritime SFI Qualified Logging Professional	83
Operations Management Plan/Map Onsite	93
First aid supplies	100
Training Records Shown for First Aid	93
Personal Protective Equipment	93
Seasonal, Provincially Required Wildfire Suppression Equipment	100
Machine	100
Remote Location & Emergency Response Plans in Place	73
System to Check on Employees Who Work Alone	93
Current Documentation	100
PHP Policies & Work Instruction Manual or Handbook on Site	87
OHS Compliant Safety System & Documentation	87
Lock Out - Tag Out Policy in place	87
Spill Kit on Site	93
Pumps	87
Trailer Permits if not floated	93
WHMIS and TDG Trained Personnel	93
Waste Oil Disposal System in Place	100
Tanks Properly Labeled / Placarded to TDG and WHIMS Regulations	87
Storage Tanks Located Not Closer Than 30m From Any Watercourse	93
Bridges Used and Erosion Controlled on Approaches to Stream Crossing	100
Temporary Bridges Removed, Water Courses Cleared of Debris	100
No Evidence of Siltation	100
Harvested Merchantable Trees Utilized	100
Harvest meets Mapped/Operating Plan/Prescription Requirements	100
Garbage & Litter Collected to be Discarded	100
No Discarded Parts/Tires	100
Disposed of Hazardous Materials	100
Road Drains & Culverts Cleared of Debris	100
Conservation of Known Critical Wildlife Habitat, Biodiversity & Species at Risk	100
SMPs Followed in Known Forests with Exceptional Conservation Value	93
SMPs Followed for Known Invasive Exotic Plants and Animals	100
Known Characteristics of Special Sites Preserved	100
Lock Out - Tag Out Procedure in Machine	100
Lock and Tag Present	100
Fuel Tank Hoses in Good Condition	100

PHP Audits of Trucking Contractors

Audit Requirement	Percent Within Compliance
Hard Hat	100
High Visibility Vest	100
Safety Boots	100
Safety Glasses	95
First Aid Kit	95
Truck MVI and Trailer MVI	93
Loader Inspection	93
Lock Out/Tag Out	78
Government Daily Trip Inspections by Driver	100
Current Procedures Manual	95
Reflective Tape to Standard	98
Trailer / Loader Steps & Hand Grips	100
Seatbelt or Armrest	100
Load Slip Completed	100
Chip Trucks - Tarp Effective and in Good Repair	100
Chip Trucks - Rear Door	100
Chip Trucks - Rear Door Latches in Good Repair	100
Air Binder System	100
Log Straps	100
Manual Binding System	100
Grapple Secured from Swinging	100
Load Height at Stakes	100
Load Crowned & Top Chain Touching Wood	100
Wood Properly Aligned	100
No Excessive Limbs Debris	100
First Aid Certified	100
Communication Device	100
Flares / Triangles	100
Fire Extinguisher(s)	100
One Round Point Shovel	95
Chainsaw On Truck	100
Fall Protection / Rail Bar	100
Spill Kit	88
No Visible Signs of Leaking Oil / Fuel	100

Sustainable Forest Management Indicators

Indicators of Sustainable Forest Management

Since 2002, PHP has been monitoring and reporting on a variety of sustainable forest management (SFM) indicators. To measure sustainable management over time for a range of forest values, indicators were developed to monitor progress in the maintenance or enhancement of those values.

The Woodlands monitoring program for SFM indicators consists of internal assessments and audit programs. Results from these programs are analysed and summarized on an annual basis to determine if targets are being achieved or have failed to meet set targets. Accordingly, this identifies management actions that must be adjusted to achieve desired outcomes.

Local-level SFM indicators were developed according to the Canadian Council of Forest Ministers' criteria for sustainable forest management. These criteria are:

- Conservation of Biological Diversity
- Forest Ecosystem Condition and Productivity
- Conservation of Soil and Water Resources
- Forest Ecosystem Contributions to Global Ecological Cycles
- Multiple Benefits to Society
- Accepting Society's Responsibility for Sustainable Development

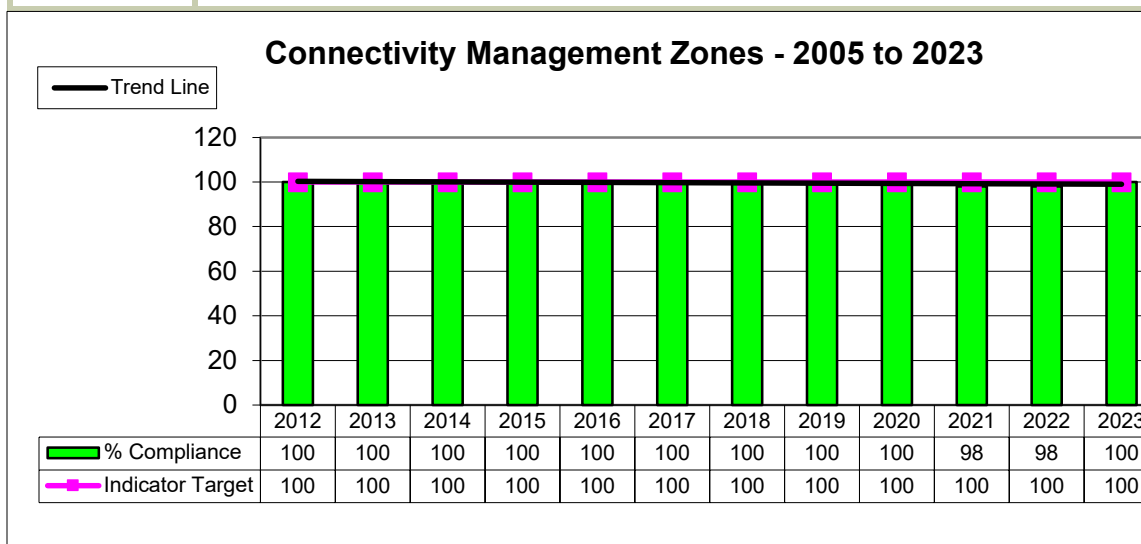## CRITERION 1 - CONSERVATION OF BIOLOGICAL DIVERSITY

Conserve biological diversity by maintaining integrity, function, and diversity of living organisms and the complexes of which they are part.

Indicator 1.1 - Species Diversity - Significant Species

OBJECTIVE	Managing and mitigating effects on known occurrences of endangered and threatened species.	
INDICATOR	Annual review of NSDNRR's Significant Species and Habitats Database and other species status lists.	
TARGET Complete annual review of NSDNRR's Significant Species and Habitats Database, and other species status lists, and implement appropriate management activities where necessary.		VARIANCE None allowed
2023 Update	The Significant Habitat database was last updated in 2023 by the provincial Department of Natural Resources & Renewables and provided to PHP to be used in forest management planning activities. The 2023 Significant Habitat database maintained by NSDNRR contains 48,765 ha of significant species habitats potentially affected by forest management activities on PHP's landbase. The areas identified in the 2018 data are categorized into the following: Deer Wintering — 21,649 ha Migratory Bird — 262 ha Moose Wintering — 11,076 ha Species at Risk — 11,275 ha Species of Concern — 3,499 ha Other Habitat — 1,014 ha These data are used in operational planning and is reviewed by NSDNRR during the harvest approval process. Other species status and appropriate management strategies have been incorporated into PHP's High Conservation Value Forest (HCVF) Assessment Report.	

Indicator 1.2 - Genetic Diversity - Connectivity Management Zones

OBJECTIVE	To maintain landscape level Connectivity Management Zones (CMZs) according to company connectivity guidelines.	
INDICATOR	Percent of CMZs managed according to connectivity guidelines.	
TARGET Maintain a compliance level of 100% of the total number of CMZs meeting the 100 m solid cover with minimum 30% crown closure.		VARIANCE 10%
2023 Update	All 46 CMZs assessed for 100 m solid cover with minimum 30% crown closure met the connectivity guidelines for 100% compliance.	

Connectivity Management Zones - 2005 to 2023

— Trend Line

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
% Compliance	100	100	100	100	100	100	100	100	100	98	98	100
Indicator Target	100	100	100	100	100	100	100	100	100	100	100	100

Indicator 1.3 - Protected Areas - Protected Area Strategy

OBJECTIVE	To identify and maintain areas reserved from harvest under a protected areas strategy in eastern Nova Scotia.	
INDICATOR	Proportion of area reserved from harvest under a protected area strategy.	
TARGET Maintain 12% of total area reserved from harvest under a protected area strategy.		VARIANCE +/- 1%
2023 Update	In the 7 eastern counties where PHP operates, there is a total of approximately 209,700 ha (29%) of legally protected Crown land. On just the Crown FULA lands, approximately 82,517 hectares (16%) is legally or pending legal protection (see below map). Additionally, there is 6,147 ha administratively protected by PHP. These areas are also on Crown land and were identified as ecologically significant during the HCVF assessment process.	

Indicator 1.4 - Protected Areas - Old Forest

OBJECTIVE	To maintain old forest conditions throughout the landscape.	
INDICATOR	Percent of forest management area protected for old forest values.	
TARGET Maintain 8% of forest areas in old forest condition.		VARIANCE +/- 1%
2023 Update	The current total area reserved as old forest on the Crown FULA lands is 9%. In 2018, the NS Department of Natural Resources & Renewables initiated a new old-growth forest protocol for the assessment of mature climax hardwood stands greater than 11 meters height based on forest inventory data. Since that time, an additional 38,173 hectares of old-growth areas have been identified and protected on PHP's Crown license area.	

The FSC Canada National Forest Stewardship Standard requires certified companies to assess the certified land-base for the sum of protected areas and designated conservation lands. Named the Conservation Area Network, the standard requires that the network must comprise a minimum of 10% of the area of the management unit. The management unit in this case is defined as the certified land-base, which in this case, are the PHP FULA lands.

The protected, pending protected, and old growth/old forest areas identified under indicators 1.3 and 1.4 were used to assess the Conservation Area Network. Since there can be spatial overlap of old growth/old forest areas inside protected areas, the GIS data layers were unioned to remove all overlaps and the possibility of double-counting areas. The GIS analysis has identified that approximately 18% of PHP's certified land-base is considered the Conservation Area Network.

Conservation Area Network
on PHP FULA Lands

Total Protected, Pending Protected & Old Growth/Old Forest Area = 94,485 ha
(overlaps removed)

Total FULA License Area = 519,532 ha

% Conservation Area Network on FULA = 18%

■ Protected, Pending Protected & Old Growth/Old Forest Area
■ FULA License Area
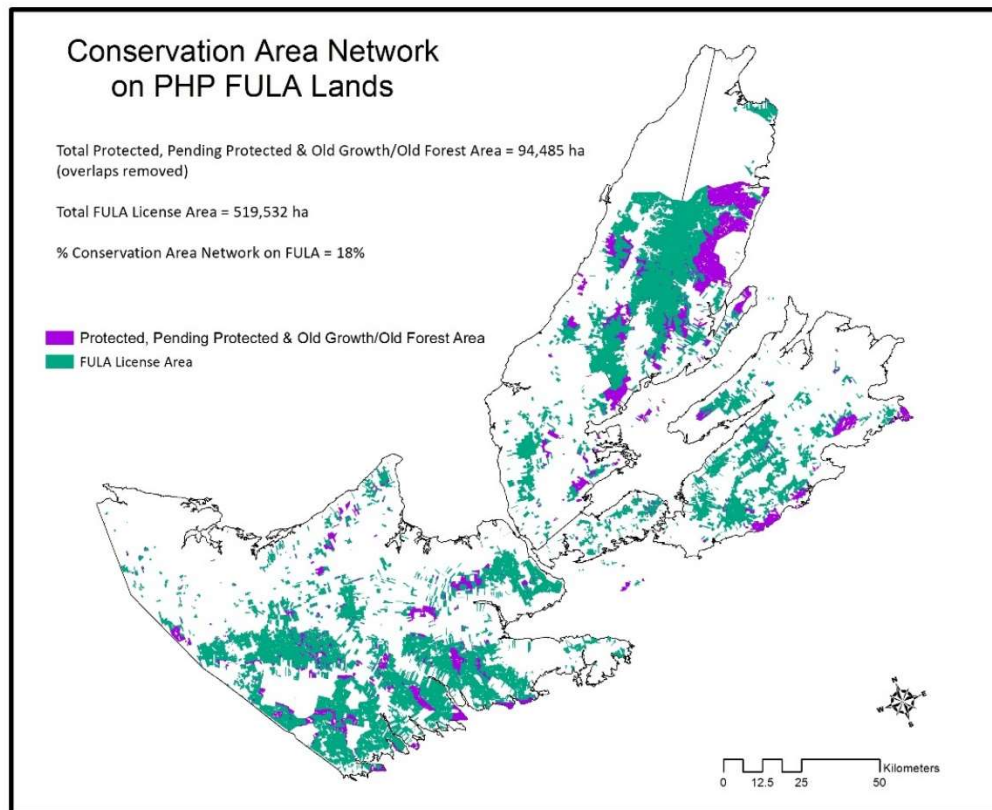
CRITERION 2 - FOREST ECOSYSTEM CONDITION AND PRODUCTIVITY

Conserve forest ecosystem condition and productivity by maintaining the health, vitality, and rates of biological production.

Indicator 2.1 - Forest Ecosystem Resilience - Natural Regeneration

OBJECTIVE	To promote Acadian forest characteristics through the use of natural regeneration.	
INDICATOR	Proportion of even-aged management regenerated naturally.	
TARGET Naturally regenerate with appropriate species 50% of total even-aged management area.		VARIANCE +/- 10%
2023 Update	In 2023, 46% of the total even-aged management area was naturally regenerated.	

Natural Regeneration of Even-aged Management Area - 2012 - 2023

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
% Natural Regeneration	63	60	60	60	60	65	65	60	60	36	44	46
Indicator Target	50	50	50	50	50	50	50	50	50	50	50	50
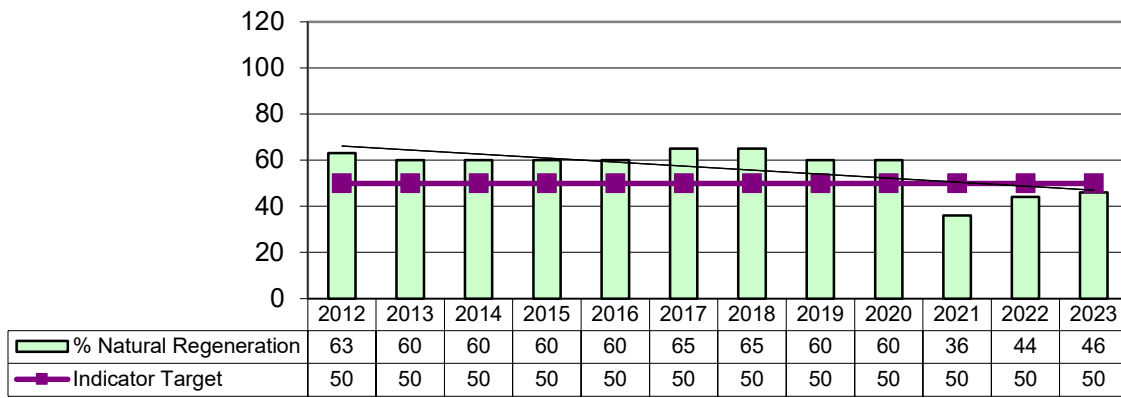
Indicator 2.2 - Forest Ecosystem Resilience - Harvest Treatments

OBJECTIVE	Reduce clearcut area by applying alternative harvest treatments in appropriate ecoregions.	
INDICATOR	Proportion of total (softwood and hardwood) area harvested using unevenaged, thinning, shelterwood, selection cut and/or partial cut techniques by EPU.	
TARGET Increase non-clearcut treatments in appropriate ecoregions to represent 40% of total harvest by 2015 and 50% of total harvest by 2025.	VARIANCE +/- 5 Year Period	
2023 Update	PHP has been transitioning to the new provincial 'Silvicultural Guide for the Ecological Matrix', which outlines a range of harvest treatments that are different in their application and operational results from historical treatment types used in the province. Therefore, the traditional clearcut harvest system used previously by PHP is no longer used. The new Variable Retention 10% (VR10) harvest treatment would be the closest to resemble the clearcut system, however, a VR10 maintains more stand structure following harvest than the previous clearcut treatment. Therefore, it is not a straight comparison between a VR10 and a clearcut treatment. For the 2023 update, a summary of treatments completed is provided below as an interim update, while a new set of indicators and targets are under development. It is expected that new values, objectives, indicators and targets (VOITs) will be finalized by the end of 2024.	

2023 Harvest Completions	Hectares Treated
Ecological Matrix	**2327**
Acadian Zone	**1526**
Commercial Thinning	204
Uniform Shelterwood with Reserves	25
Other	36
Gap Shelterwood with Reserves	58
Strip Shelterwood with Reserves	26
Variable Retention with 10% Reserves	292
Variable Retention with 20% Reserves	421
Variable Retention with 30% Reserves	294
Salvage with Retention	52
Single Tree Selection	7
Medium Retention Irregular Shelterwood with Gaps	72
High Retention Irregular Shelterwood with Continuou:	33
High Retention Irregular Shelterwood with Gaps	6
Boreal Zone (CB Highlands)	**801**
Commercial Thinning	398
Strip Shelterwood with Reserves	5
Variable Retention with 10% Reserves	373
Partial Overstory Removal with 1/3 Retained	25
Grand Total	**2327**

Indicator 2.3 - Forest Ecosystem Productivity - Forest Health

OBJECTIVE	To minimize fire, insect and disease occurrence across the forest landscape.	
INDICATOR	Area (by ha) of forest killed by fire, insect and disease.	
TARGET Less than 500 ha of forest killed by fire, insect and disease.		VARIANCE + 1000 ha
2023 Update	There was no evidence or recorded data by NS Department of Natural Resources & Renewables for total forest killed by fire, insect, or disease in 2023.	

Indicator 2.4 - Forest Ecosystem Productivity - Budworm Hazard

OBJECTIVE	To minimize budworm hazard on the Cape Breton Highlands.	
INDICATOR	Area (by ha) killed by budworm outbreak on the Cape Breton Highlands.	
TARGET To have zero hectares of forest killed by a budworm outbreak.		VARIANCE + 800 ha
2023 Update	In 2023, 0 ha of forest in Cape Breton Highlands was killed by a budworm outbreak. Populations rose in the Cheticamp/Inverness area to moderate but the rest of the province remained low.	

CRITERION 3 - CONSERVATION OF SOIL AND WATER RESOURCES

Conserve soil and water resources by maintaining their quantity and quality in forest ecosystems.

Indicator 3.1 - Soil Protection - Steep Slopes

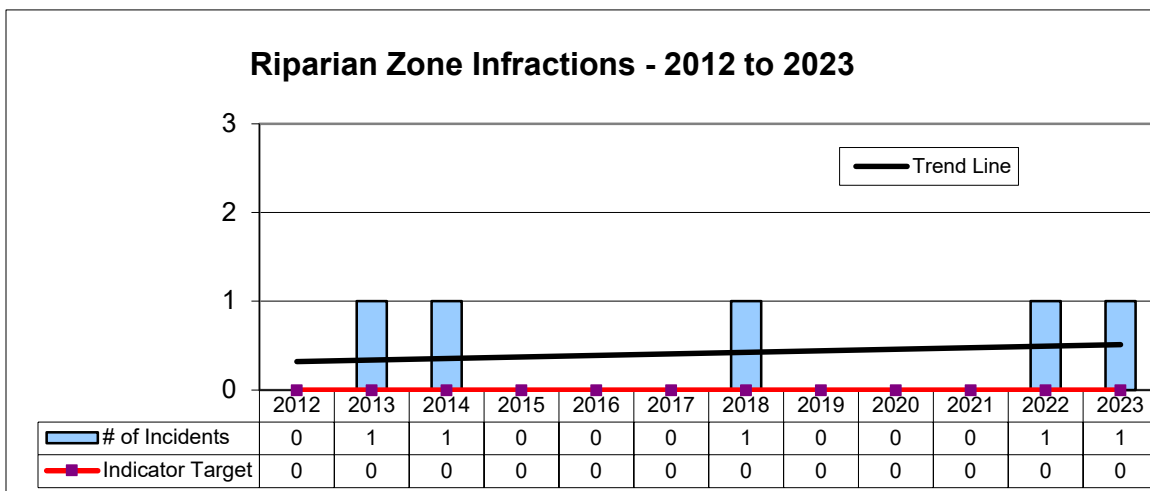| OBJECTIVE	To avoid regular harvesting in identified steep slope areas.	
INDICATOR	Area (by ha) of regular harvest in steep slope areas.	
TARGET Maintain no regular harvest in areas with greater than 30% average slope.		VARIANCE + 20 ha
2023 Update	A GIS exercise of overlaying steep slope areas with completed harvest areas shows 5 hectares of area. The hectare is made up of several small areas. The steep slope data are based on spatial data that identifies slopes greater than 30% average using contour data. It is not based on the actual % slope of any given area as could be determined on-the-ground. Most often, the areas showing as harvested are slivers due to inaccuracies in the data.	

Indicator 3.2 - Water Protection - Watersheds

OBJECTIVE	To protect hydrological functions in all watersheds.	
INDICATOR	Proportion of identified watershed area (that is managed by PHP) in a closed forest condition.	
TARGET Each watershed shall have 80% of its area (that is managed by PHP) in a closed forest condition.		VARIANCE - 5%
2023 Update	PHP has identified 15 watersheds throughout its management area that are monitored specifically for closed forest condition (> 10 years of age). In 2023, all 15 watersheds had 80% or more of its area in a closed forest condition.	

Watershed Name	% Closed Forest 2023	% Closed Forest 2022	% Closed Forest 2021	% Closed Forest 2020	% Closed Forest 2019	% Closed Forest 2018	% Closed Forest 2017
Antigonish Municipal (2,169 ha)	100%	100%	100%	100%	100%	100%	100%
Guysborough 1 Municipal (2,778 ha)	88%	86%	82%	84%	86%	86%	86%
Inverness Municipal (131 ha)	86%	85%	85%	85%	86%	85%	85%
Victoria Municipal (974 ha)	93%	93%	95%	95%	97%	95%	97%
Baddeck River (15,439 ha)	95%	95%	95%	95%	94%	95%	95%
East River (9,896 ha)	92%	90%	89%	90%	93%	91%	95%
Grand River (5,749 ha)	97%	97%	95%	94%	93%	92%	90%
Liscomb River (14,824 ha)	97%	97%	96%	96%	96%	95%	94%
Margaree River (35,929 ha)	93%	93%	93%	93%	93%	90%	92%
Middle River (20,527	90%	90%	90%	90%	92%	93%	94%

Mira River (13,946 ha)	93%	93%	92%	91%	92%	92%	92%
New Harbour River (2,101 ha)	99%	98%	98%	98%	98%	98%	93%
North River (15,830 ha)	90%	90%	90%	86%	85%	88%	90%
River Inhabitant (7,852 ha)	96%	97%	96%	94%	96%	96%	96%
St. Mary's River (53,442 ha)	92%	92%	91%	91%	91%	92%	93%

Indicator 3.3 - Water Protection - Riparian Zone Management

OBJECTIVE	To protect and maintain all riparian functions.	
INDICATOR	Number of riparian zone non-conformance incidents.	
TARGET To have zero non-conformance incidents.		VARIANCE None allowed
2023 Update	There was one infraction of the Wildlife Habitat and Watercourse Protection Regulations in 2023, where insufficient number of wildlife clumps were left on site following harvest. Error was due to new operator and insufficient training. Operator received additional training to ensure operating guidelines are met.	

Riparian Zone Infractions - 2012 to 2023

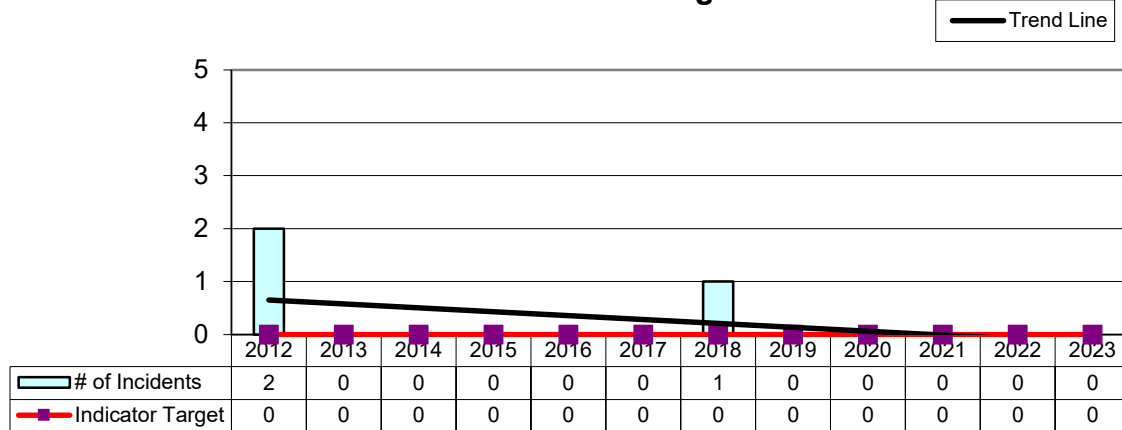|	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
# of Incidents	0	1	1	0	0	0	1	0	0	0	1	1
Indicator Target	0	0	0	0	0	0	0	0	0	0	0	0

The Wildlife Habitat and Watercourse Protection Regulations can be found under Section 40 of the Forests Act. They were developed for application by people working in forestry and are applicable to watercourses and marshes, which include wetlands, lakes, ponds, rivers, streams, creek, estuary, or salt-water body that contains water for at least part of the year. The below image illustrates how special management zones must be established around watercourses and marshes when conducting forestry operations.
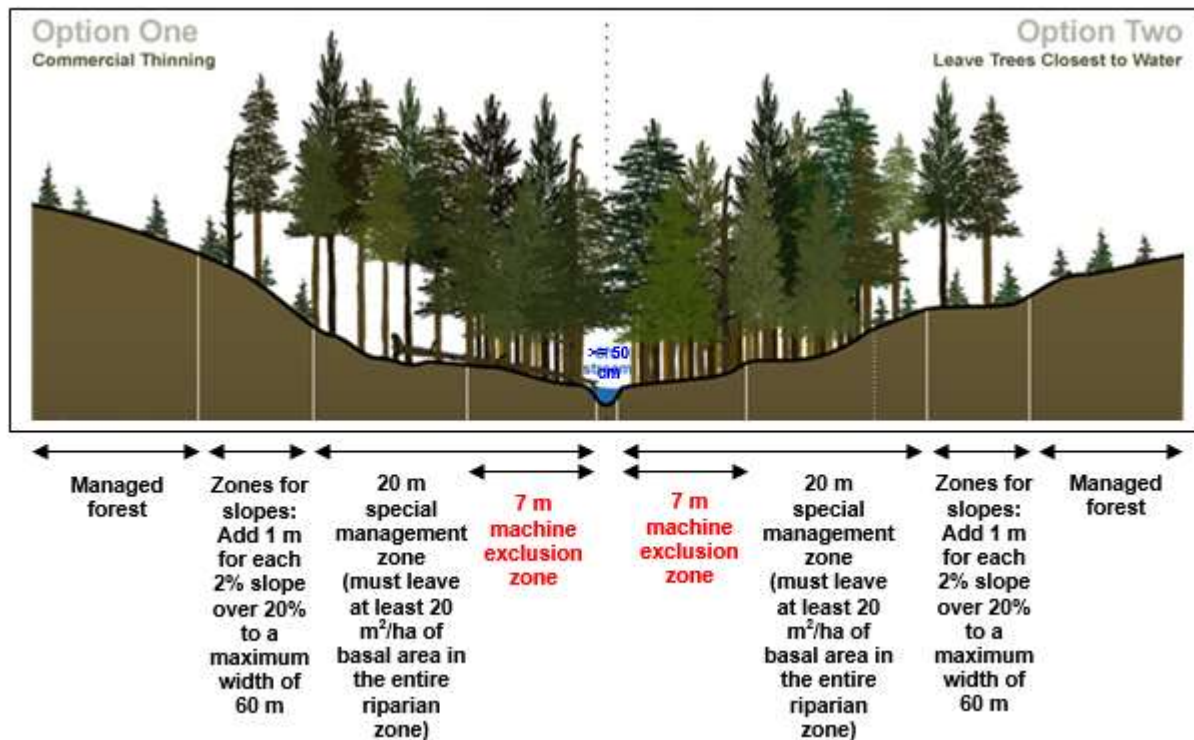
Indicator 3.4 - Water Protection - Roads and Stream Crossings

OBJECTIVE	To reduce negative impacts on water quality resulting from road construction.	
INDICATOR	Number of road construction and stream crossing incidents (new and upgrades) according to company guidelines.	
TARGET To have zero non-conformance incidents.		VARIANCE None allowed
2023 Update	In 2023, there were no incidents related to road construction and stream crossings.	

Road Construction & Stream Crossings - 2012 to 2023

Trend Line

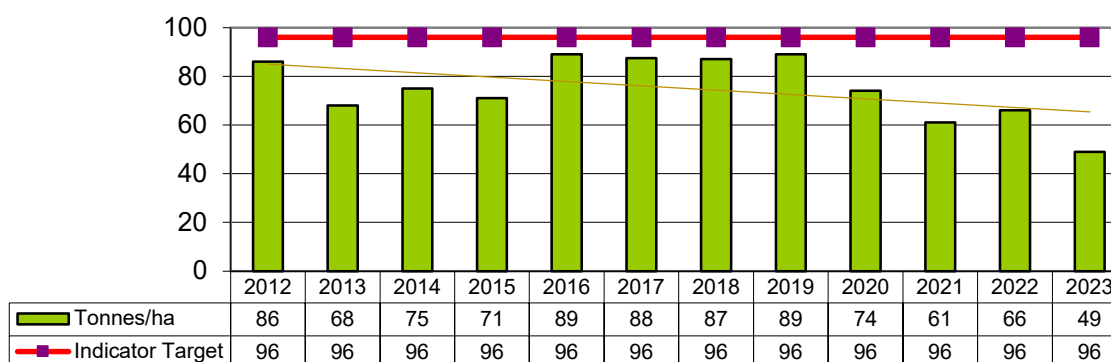|	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
# of Incidents	2	0	0	0	0	0	1	0	0	0	0	0
Indicator Target	0	0	0	0	0	0	0	0	0	0	0	0

CRITERION 4 - FOREST ECOSYSTEM CONTRIBUTIONS TO GLOBAL ECOLOGICAL CYCLES

Maintain forest conditions and management activities that contribute to the health of global ecological cycles.

Indicator 4.1 - Forest Carbon - Harvest Volume

OBJECTIVE	To reduce carbon emissions.	
INDICATOR	Period average volume per hectare harvested.	
TARGET
Increase the average harvest volume by 20% within the next 25 years.	VARIANCE
+/- 5 Year Period	
2023 Update	The average volume per hectare harvested was 49 tonnes/ha. This is based on all treatments excluding commercial thinning's. This volume is down by approximately 25% from 2022 since new ecological treatments have been implemented which leaves more retention on site.	

Harvest Volume per Hectare Status - 2012 to 2023

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Tonnes/ha	86	68	75	71	89	88	87	89	74	61	66	49
Indicator Target	96	96	96	96	96	96	96	96	96	96	96	96

Indicator 4.2 - Forest Carbon - Total Growing Stock

OBJECTIVE	To contribute to total carbon storage through maintenance of above-ground carbon pool.	
INDICATOR	Total growing stock of both merchantable and non-merchantable species on forest lands.	
TARGET Total growing stock of 21,221,500 m^3		VARIANCE +/- 1,000,000 m^3
2023 Update	The total growing stock for softwood is estimated to be 17,895,038 m^3 and the total growing stock for hardwood is estimated to be 15,019,044 m^3.	

Indicator 4.3 - Forest Land - Road Construction

OBJECTIVE	To minimize amount of deforested land.	
INDICATOR	Width of permanently disturbed area due to road construction.	
TARGET Reduce average road width of new and upgraded constructed roads by 10%.		VARIANCE 5% +/-
2023 Update	Average road width for roads measured in 2023 was 8 meters.	

No
Data

CRITERION 5 - MULTIPLE BENEFITS TO SOCIETY

Sustain flows of forest benefits for current and future generations by providing multiple goods and services.

Indicator 5.1 - Timber and Non-timber Benefits - Hardwood Management

OBJECTIVE	To increase the future value of the hardwood resource.
INDICATOR	Area (by ha) of hardwood management.

TARGET Manage 2,800 hectares of hardwood in the first five-year period of the 2015 Long-Term Plan.		VARIANCE +/- 500 ha
2023 Update	In 2023, the area of hardwood management was approximately 100 hectares. Since implementing the 2015 long-term plan, PHP has managed 2,469 ha of hardwood forests (88% of 2,800 ha target in the first 5-year period of the plan). Hardwood management has decreased over the last few years since the NS Department of Natural Resources & Renewables initiated an old-growth assessment protocol. A potential old-growth layer of mature climax hardwood based on 11 metre height of the forest inventory is being used to identify potential old-growth stands for further assessment. Stands that are assessed and meet the new old growth definition are protected under the provincial old-forest policy.	

Indicator 5.2 - Communities and Sustainability - Harvest Level

OBJECTIVE	To continue to harvest at a sustainable rate.
INDICATOR	Annual harvest level.

TARGET Harvest 275,000 tonnes of softwood per year.		VARIANCE -10%
2023 Update	In 2023, the softwood volume amount harvested was 172,000 tonnes (63% of annual harvest level). The Annual Allowable Cut was also reduced from 400,000 tonnes to 275,000 tonnes based on a new timber supply analysis for ecological forestry and new harvest treatments.	

PHP FULA Crown Land			
Year	Softwood Sustainable Harvest Level (tonnes)	PHP Actual Softwood Harvest (tonnes)	% AAC Harvested
2013	400,000	258,292	65%
2014	400,000	336,329	84%
2015	400,000	322,268	81%
2016	400,000	291,951	73%
2017	400,000	329,777	82%
2018	400,000	359,062	90%
2019	400,000	285,152	71%
2020	400,000	230,403	58%
2021	400,000	177,165	44%
2022	400,000	217,030	54%
2023	275,000	172,000	63%
Total	**4,275,000**	**2,979,429**	70%
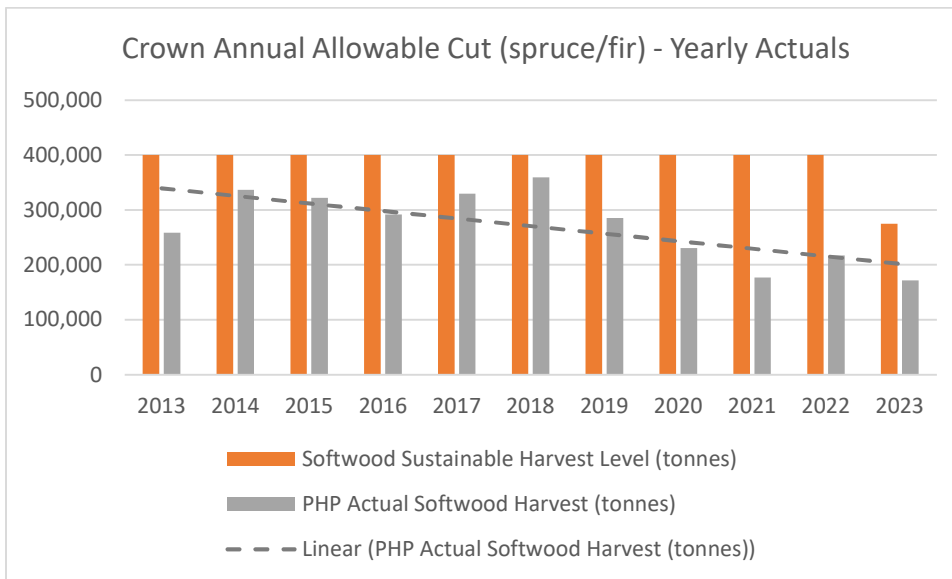
Indicator 5.3 - Communities and Sustainability - Third Party Requests

OBJECTIVE	Where appropriate, provide economical, recreational and cultural opportunities to the general public.	
INDICATOR	Number of reasonable third party requests approved.	
TARGET Approve all reasonable third-party requests received each year.		VARIANCE 10 requests
2023 Update	A total of 13 third party requests were received in 2023. All were approved by PHP.	

Indicator 5.4 - Fair Distribution of Benefits and Costs - Sales to Other Mills

OBJECTIVE	To ensure fair distribution of forest resources.	
INDICATOR	Proportion harvest volume sold to other buyers.	
TARGET Sell at least 40% of annual harvest volume to other buyers.		VARIANCE +/- 5 Year Period
2023 Update	In 2023, the company sold approximately 25% of the annual harvest volume to other buyers. Products included firewood, fuelwood, palletwood, sawlogs, studwood, and veneer logs. Due to an increase purchase of chips by PHP, harvest operations have generally decreased leading to a reduced annual harvest volume sold to other buyers.	

CRITERION 6 - ACCEPTING SOCIETY'S RESPONSIBILITY FOR SUSTAINABLE DEVELOPMENT

Soceity's responsibility for sustainable forest management requires that fair, equitable and effective forest management decisions are made.

Indicator 6.1 - Aboriginal and Treaty Rights - Respect First Nations

OBJECTIVE	To provide opportunities to better understand, recognize and respect local Mi'kmaw and Treat Rights.	
INDICATOR	Number of opportunities to meet with Mi'kmaw organizations and/or community representatives.	
TARGET Ensure a minimum of six opportunities to meet with Mi'kmaw organizations and/or individuals annually.		VARIANCE - 1 Meeting
2023 Update	In 2023, the company met at least 10 times with Mi'kmaq organizations, communities, or individuals related to forest management agreements with CMM and UINR, and other initiatives related to Mi'kmaq Forestry Initiative lands, Indigenous Protected & Conservation Area lands, Free Prior Informed Consent, and the Cape Breton Highlands.	

Indicator 6.2 - Aboriginal and Treaty Rights - First Nation Agreements

OBJECTIVE	To build capacity within Mi'kmaq communities to provide increased employment opportunities for Mi'kmaw individuals.	
INDICATOR	Volume harvested under agreements with Mi'kmaq communities.	
TARGET To increase the softwood volume harvested under First Nation agreements to 30,000 tonnes.		VARIANCE - 5,000 tonnes
2023 Update	In 2023, the total volume harvested by Unama'ki Institute of Natural Resources was 0 tonnes. This was due to lack of contractor capacity as well as redirection of resources on the Mi'kmaq Forestry Initiative and Indigenous Protected & Conservation Area project. In 2023, the total volume harvested by Confederacy of Mainland Mi'kmaq was approximately 34,000 tonnes.	

Indicator 6.3 - Decision-Making - Education and Extension

OBJECTIVE	To advance sustainable forest management principles through commitments to research and extension.	
INDICATOR	Level of investment and contribution to education and extension initiatives.	
TARGET The company will provide $0.03 of direct and/or in-kind contributions to education and extension initiatives for every m^3 harvested within the defined forest area.		VARIANCE +/- $0.01
2023 Update	In 2023, $1.26 for every m^3 harvested was contributed to education and extension initiatives.	

FSC Canada Specific Monitoring Updates

Introduction

The new FSC National Forest Stewardship Standard of Canada, released in 2020, has identified specific indicators requiring monitoring and assessment as they relate to significant environmental impacts resulting from management activities. This section summarizes those requirements and PHP's monitoring results, where applicable.

FSC INDICATOR	Poor Regeneration

Description
Regeneration is when forests are restocked, either naturally or through plantings, so a new healthy forest develops over time.

Monitoring Approach
Many areas harvested by PHP are scheduled for planting following harvest. For areas that are not, a cutover assessment is completed within two years to determine if planting is required and where natural regeneration is lacking, planting will be carried out within two years from harvest.

Based on the vegetative community and harvest treatment employed, three options are possible:

1. No regeneration treatments are required for the area. A cutover assessment is still completed.
2. It is uncertain whether a regeneration treatment is needed. A cutover assessment is scheduled in two years from harvest.
3. There is a need to carry out a regeneration treatment. The cutover assessment will be completed, and the treatment scheduled.

2023 Update	In 2023, there was 517 hectares of cutover assessment completed. A total of 1,502 hectares was planted in 2023.

FSC INDICATOR	Invasiveness or other adverse impacts associated with alien species

Description
An alien species is an insect, micro-organism or plant that is found outside of its natural range. They can affect the natural biodiversity of local ecosystems by crowding out species native to a particular area.

PHP has planted approximately 20,000 hectares of Norway spruce since the 1970's but stopped the practice in 2014. Some of the stands making up the 20,000 hectares are now unlicensed Crown, so PHP only monitors Norway spruce stands still included in its Crown license agreement with the province. Norway spruce is not considered to be a highly-invasive species, however, PHP continues to monitor these stands for regeneration and seeding outside the planted area.

Monitoring Approach
PHP has been monitoring planted Norway spruce stands since 2013. PHP annually selects two stands minimum for assessment that have been planted with Norway spruce to determine if the species is regenerating and seeding outside of the planted area. A Norway spruce regeneration survey tally sheet is used to tally total softwood regeneration and total Norway spruce regeneration. Plots are 1:1000th of a hectare (1.78 m) and at an intensity of 1 plot per hectare. Two plots per stand are also taken in adjacent stands to determine if any seed has dispersed outside the planted stand.

2023 Update	In 2023, two Norway spruce stands were selected for assessment. Regeneration and/or seeding inside or outside the planted stand was not found.

FSC INDICATOR	Adverse effects of fertilizers

Description
Fertilizers used in forested areas can benefit tree growth, however, they can also affect soil and water quality because of chemicals found in them.

Monitoring Approach
FSC Canada states that the use of fertilizers applied directly on the forest management unit is the focus of this monitoring requirement and does not include fertilizer that may be used in the growing of nursery stock.

2023 Update	PHP does not apply fertilizers directly on the forest management unit, and therefore, no monitoring is required.

FSC INDICATOR	Adverse effects of pesticides

Description
FSC Canada defines pesticides as any substance or preparation prepared or used in protecting plants or wood or other plant products or human health or livestock or biodiversity from pests; in controlling pests; or in rendering such pests harmless. (This definition includes insecticides, rodenticides, acaricides, molluscicides, larvaecides, fungicides and herbicides).

Monitoring Approach
Not applicable to PHP.

2023 Update	PHP has not applied herbicides for forest management since 1997. Other pesticide use defined by FSC Canada is not applied by the company.

FSC INDICATOR	Adverse effects of biological control agents

Description
FSC Canada defines biological control agents as organisms used to eliminate or regulate the population of other organisms.

Monitoring Approach
Not applicable to PHP.

2023 Update	PHP does not use biological control agents in its forest management.

FSC INDICATOR	Physical damage to soil, loss of soil nutrient and loss of productive forest area

Description
Healthy soils are a key component of responsible and sustainable forest management. Soil quality is defined as the capacity of a soil to function within an ecosystem to sustain biological productivity, maintain environmental quality, and promote plant and animal health. In addition, soil health definitions include maintaining the integrity of nutrient cycling and resilience to disturbance or stress. Tree or stand growth has often been used as an indicator of soil productivity changes.

Monitoring Approach
PHP implements procedures and monitoring regarding ground disturbance and rutting resulting from forest management activities. Ground disturbance means any area where the surface organic horizons are completely removed or redistributed on a site (mineral soil has been exposed). Harvested sites with 10% or less of ground disturbance is considered to be harvested with due regard for soil protection (also within rutting limitations).

PHP aims to minimize rutting by using pre-planning methods such as time of harvest (ie. season) and soil types. PHP supervisors monitor sites for excessive rutting as part of regular site visits. If rutting is deemed excessive or becomes greater than the maximum rut allowed, forwarding on that trail will cease until remediation measures are put in place or until site conditions approve (operations will be ceased).

Ground disturbance and rutting are monitored on all Crown harvest sites using an internal audit process. Compliance with PHP's procedures are checked during seasonal audits as well as on post-harvest inspections. Crown contractors also check rutting conditions weekly and record their assessment on the contractor weekly check list.

2023 Update	In 2023, Crown contractors were audited by PHP operations supervisors. The overall results of these audits are shown on page 10 of this report. For ground disturbance and machine rutting guidelines specifically, there was full compliance with PHP procedures.

Machine Rutting	95
Ground Disturbance	100

FSC INDICATOR	Adverse effects of increased access

Description
Forest access roads are a needed element of forest management, but their impact on the environment can be significant. Increased access can cause harm to wildlife through excessive hunting or predation, changes in wildlife habitat use due to noise, and entrance into ecologically sensitive or protected areas.

Monitoring Approach
The forest roads used by PHP to access forest management areas are owned by the provincial government. PHP does not have the mandate to close access to roads, but occasionally PHP supervisors will pull temporary bridges from roads to use in other locations. Signs are posted to warn potential access users about a crossing site. If access to an area through a road was deemed necessary to close, the provincial government would make that decision and implement their own measures to close access.

2023 Update	No forest roads were closed to public access in 2023 due to PHP or DNR activities. However, Hurricane Fiona caused significant damage to forested areas in September 2022. Due to accessibility issues, some roads were impassable until repairs and/or downed trees were removed from road surfaces.

FSC INDICATOR	Site level damage of harvesting and extraction on residual trees and on environmental values

Description
Site level damage on residual trees and other environmental values from harvesting activities can affect the overall quality of the site for healthy regeneration and biological diversity.

Monitoring Approach
For several years, PHP has implemented procedures for retaining residual standing trees for ecological, aesthetic or production functions. Interim Retention Guidelines have recently been developed by the provincial government and are to be applied on Crown land. The purpose of the guidelines is to increase the amount of retention above the required wildlife clumps under the Wildlife Habitat & Watercourse Protection Regulations. The guidelines are summarized as:

1. Leave approximately 10-30% stand-retention when applying an overstory removal or seed tree harvest.
2. Leave retention trees distributed though the stand wherever possible.
3. Other priorities for retention:
   a. Leave uncommon tree species that form a small proportion of stand (eg. Ironwood, late successional intermediate to tolerant species, large old super canopy trees)
   b. Wildlife trees and biodiversity features
   c. Growing stock and advanced regeneration (preferably late successional intermediate to tolerant species)
   d. Deep rooted overstory of wind-firm trees (sugar maple, yellow birch, white pine, red oak, white ash)

	e. Shallow rooted overstory of wind-firm trees (red spruce, eastern hemlock, white spruce, red maple) f. Deep rooted non-late successional intermediate to tolerant species overstory (red pine, jack pine, white birch)
2023 Update	Internal audits completed in 2023 on Crown land operations resulted in 100% compliance to being within acceptable levels of damage to leave trees. PHP measures acceptable levels of damage or scarring as being under 4 inches squared. | Damage to Leave Trees Acceptable	100	

FSC INDICATOR	Damage caused by inappropriate storage or disposal of waste materials

Description

Improper disposal or inappropriate storage of waste materials can have negative consequences for soil and water quality, as well as wildlife.

Monitoring Approach

PHP implements procedures on the disposal of hazardous materials, and storage and handling of diesel fuel tanks, on all operations. Requirements on PHP operations includes:

- Training on transportation, disposal, storage and handling of hazardous materials and diesel fuel tanks.
- Storage tanks and facilities to be located not closer than 100 meters from any watercourse, pond or lake.
- Fully stocked spill kits are present on all active operations where machinery is present.
- Weekly inspections of storage tanks
- Full tanks not filled to more than 95% capacity
- Discharge hoses must be fitted with nozzles
- Pumps are well maintained and kept free of leaks
- Spills of greater than 70 litres must be reported to Department of Environment
- Garbage and other waste materials must be properly disposed of

2023 Update	The 2023 Crown contractor audits (see page 8) resulted in 100% compliance with proper disposal of hazardous materials, no discarded parts or tires, garbage and litter properly discarded, and waste oil disposal system in place. Drip catchers on fuel tanks were at 93% compliance and storage tanks not closer than 100 meters from any watercourse was at 100% compliance. No environmental incidents were recorded in 2023 from inappropriate storage or disposal of waste materials.

High Conservation Value Forest Effectiveness Monitoring Program

Introduction

This HCVF Effectiveness Monitoring Program was developed to fulfill the requirements of Principle 9 of the FSC Maritimes Standard. To meet Principle 9 of the standard, forest managers must complete an assessment of their forest lands to identify high conservation values. There are six distinct categories that give an area critical conservation significance. FSC Canada defines an HCVF as:

High Conservation Value Forests are those that that possess one or more of the following attributes:

a) Forest areas containing globally, regionally or nationally significant:

> *i) Concentrations of biodiversity values (e.g., endemism, endangered species, refugia); and/or*

> *ii) Large landscape level forests, contained within, or containing the management unit, where viable populations of most (if not all) naturally occurring species exist in natural patterns of distribution and abundance.*

b) Forest areas that are in or contain rare, threatened or endangered ecosystems.

c) Forest areas that provide basic services of nature in critical situations (e.g., watershed protection, erosion control).

d) Forest areas fundamental to meeting basic needs of local communities (e.g., subsistence, health) and/or critical to local communities" traditional cultural identity (areas of cultural, ecological, economic or religious significance identified in cooperation with such local communities).

Once HCVF's are identified on the land-base, the forest manager must decide how these areas will be managed to maintain or enhance the values that are present. Where values exist, monitoring is needed to show that the prescribed management is effective. PHP's effectiveness monitoring program identifies two stages of monitoring for several HCVF's.

The first level of monitoring is for the basic operational procedures or special management practices that have been identified for the value (e.g. buffer zones, maintenance of special habitat characteristics, protection). This level of monitoring is typically done on an annual basis. It is also important at this stage of monitoring to ensure that PHP is aware of and implementing the best management approach, prescriptions, and/or special management practices as defined

by an outside organization. Therefore, PHP will also contact known experts and/or organizations to gather any new available information regarding management or to verify that its current management approach is the best at that time. All HCV's have an identified operational monitoring protocol that is implemented on an annual basis.

The second level of monitoring, if applicable, is strategic monitoring to determine if the HCV attribute(s) are being maintained on the landscape. For example, for a species at risk such as Boreal Felt Lichen, it is important to determine that the identified forest habitat is still suitable and that the species is still present in the habitat. Contrary to operational monitoring, not all HCV's require a strategic level of monitoring. For example, the HCV of old forest are legally protected and therefore, not available for active forest management. Therefore, the attribute of maintaining old forests on the landscape is automatically preserved. Alternatively, strategic monitoring is important for species at risk when the objective is to maintain areas of good forest habitat for a threatened species, and to ensure that the species is still present in this habitat.

For strategic monitoring, PHP recognizes that there is a required level of involvement by government agencies and/or other organizations for the monitoring of species populations and health. It is PHP's intention to collaborate with these agencies to collect the necessary information.

HCVF Category 1 – Biodiversity – Species at Risk

HCV – American Marten Habitat

HCV ATTRIBUTE	Species at Risk – Habitat and Population	
OPERATIONAL MONITORING PROGRAM		
MANAGEMENT OBJECTIVE	Maintain and/or enhance American Marten habitat in home range patches	
INDICATOR	Reserve stand structure as required within harvest areas located within the American Marten Habitat Management Zone	
MONITORING/REPORTING FREQUENCY Annual	MONITORING STRATEGY Habitat management requirements are implemented through the DNRR approval process for Crown lands. Monitor implementation of stand structure reserve using TFM. Verify annually that special management practices are still current and/or make operational changes as needed.	
DATA SOURCES The Forest Manager (TFM); PHP & DNRR field audits	COST AND DIFFICULTY Low to Moderate - Dependant on PHP's required level of involvement	
LONG-TERM STRATEGIC MONITORING PROGRAM		
MANAGEMENT OBJECTIVE	American Marten population recovery	
INDICATOR	Population estimates / use within the Marten Habitat Management Zone	
MONITORING STRATEGY DNRR is responsible for population inventory and studying habitat use.		
DATA SOURCES American Marten Recovery Team	COST AND DIFFICULTY	

DNRR Manager, Wildlife Resources	Low to High - Dependant on PHP's required level of involvement

FOREST MANAGEMENT PRESCRIPTION

These prescriptions are applied throughout the Cape Breton Highlands:

- 12-14 standing and live mature trees per ha must be left evenly spaced throughout the harvest site;

- These are in addition to all other requirements of the Wildlife Habitat and Watercourse Protection Regulations;

- Large yellow birch trees should be left standing where possible;

- Special management practices for commercial thinning operations in marten patches;

- Harvest sites should maintain at least 100 m3 of coarse woody debris/ha and mean maximum diameter of downed logs should exceed 22 cm.

There are also 30 home range patches established within the Marten Habitat Management Zone. These patches may 'migrate' within the zone, but must be a minimum 500 ha in size, circular in shape, and contain a minimum 60% marten habitat as described in the marten recovery strategy.

2023 MONITORING UPDATE

1. All harvest treatments applied throughout the Cape Breton Highlands included the above management prescriptions as required and approved by DNRR regional staff.
2. A total of 206 hectares was commercially thinned in 2023. These treatments were approved in the Marten Habitat Management Zone as per DNRR's approval process (see below map).
3. The American Marten Recovery Strategy (2007) estimates that the Marten population is less than 50 individuals. A re-introduction program began in 2007, which brought 130 individuals into Cape Breton from New Brunswick. A total of 35 individuals were collared, but their movements were lost approximately 6 months after release. DNRR does have pictures, have live-trapped, recorded tracks in snow and have received reports/sightings of marten in the Cape Breton Highlands (Peter Austin-Smith, pers. comm., 2013). A goal of the Marten Recovery Team is to have >= 30 marten in Cape Breton by 2010, >= 100 by 2030 and >= 350 by 2040.
4. Information provided by R. Milton, NSDNRR on May 21, 2019 states "during February and March 2018, bait and cameras were set in each of 30 patches forecast in the American Marten Special Management Practices to be available as habitat by 2019. Cameras were set for a minimum of 3 weeks to record whether American Marten visited the bait. Single and occasionally pairs of marten were recorded in 15 of the 30 patches, even though only 5 of these 'occupied' patches met desired habitat conditions described as greater than 30% softwood, greater than or equal to 6 m high and basal area greater than or equal to 18 m2/ha. Of the 30 forecasted sites from 2004, 24 will not meet desired habitat conditions by 2019. Marten not being recorded in the other 15 patches cannot be interpreted as confirming absence, but rather not recorded at this time. Cursory examination of marten presence and patch conditions suggests flexibility in coarse
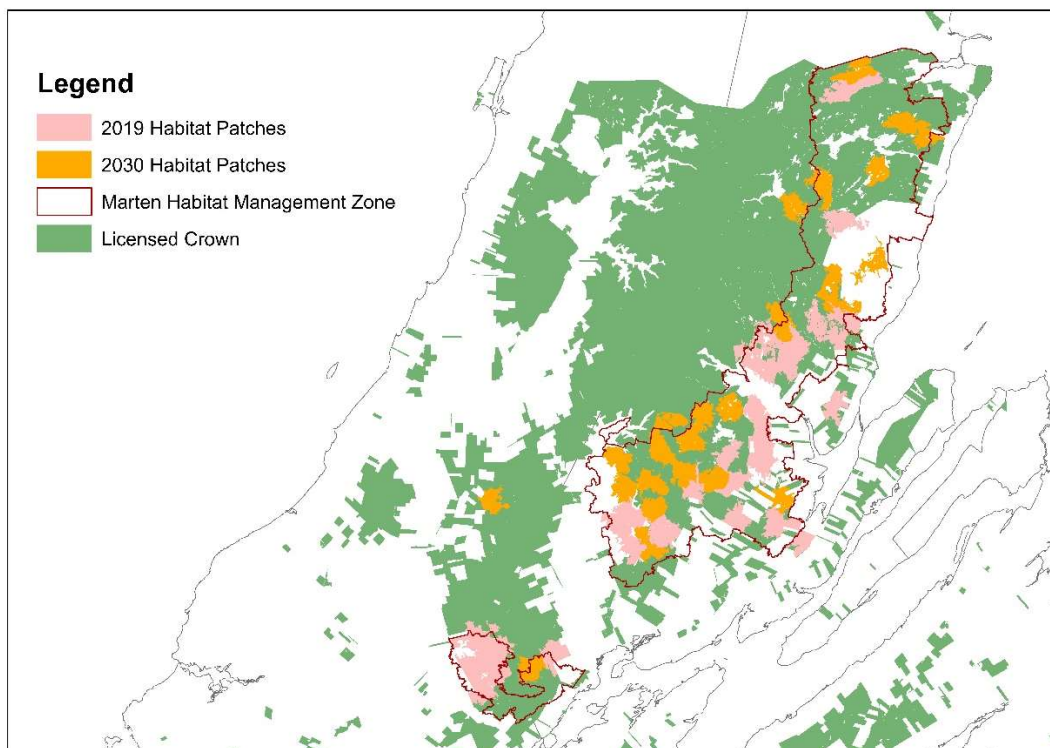
habitat descriptors used in the Special Management Practices, or undescribed critical features common to documented occupied patches. This past winter, bait and cameras were established at 13 sites on the Keppoch north of the 2019 patches. Although 5 cameras still need to be retrieved, 3 of the 8 sites had marten present. Initial consolidation of American Marten records is ongoing. However, it is of interest to note that since 2010, there have been nearly 200 valid reports of either tracks, visual sightings, or camera records.   Nearly 150 of these reports have occurred since 2015 which indicates the augmentation project conducted from 2007 through 2009 has been successful, at least in the immediate term, in maintaining a breeding population of American Marten on the highlands."

5. NSDNRR is currently reviewing the draft NS recovery plan for marten to determine a definition of core habitat under the NS Endangered Species Act. Once completed, that definition will be implemented into the recovery plan.

SUPPORTING DOCUMENTS/REFERENCES

Marten Special Management Practices, NSDNRR July 2012; Proposed Marten Recovery Strategy, NSDNRR May 2006; Status Report on American Marten, F. Scott June 2001; Weaseling their Way Back into Cape Breton? Assessing the Feasibility of Augmenting the Cape Breton Island Marten Population Through Habitat Suitability and Individual-based Modeling, Rebecca Jepessen, Acadian University Thesis, 2010.

American Marten Habitat Management Zone - Cape Breton Highlands

Legend
- 2019 Habitat Patches
- 2030 Habitat Patches
- Marten Habitat Management Zone
- Licensed Crown

HCV – Mainland Moose Habitat

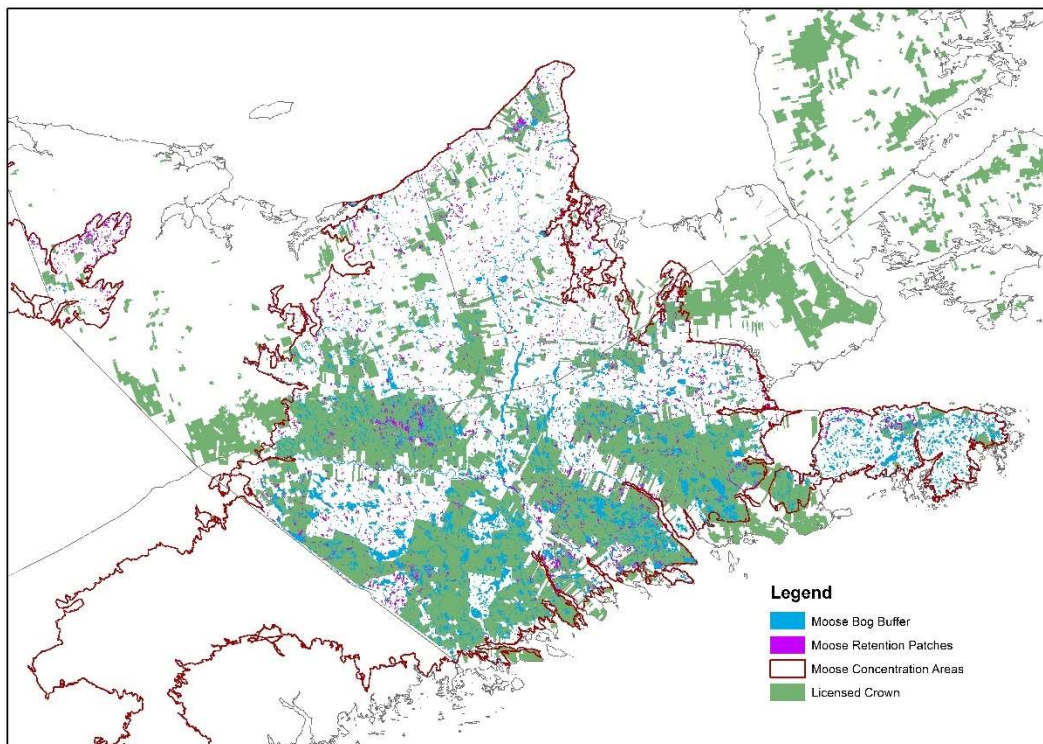| HCV ATTRIBUTE	Species at Risk – Habitat and Population	
OPERATIONAL MONITORING PROGRAM		
MANAGEMENT OBJECTIVE	Maintain and/or enhance Mainland Moose habitat	
INDICATOR	Reserve stand structure as required within harvest areas located within the five Significant Mainland Moose Population Concentration areas mapped by NSDNRR	
MONITORING/REPORTING FREQUENCY Annual	MONITORING STRATEGY Habitat management requirements are implemented through the DNRR approval process for Crown lands. Monitor implementation of stand structure reserve using TFM. Verify annually that special management practices are still current and/or make operational changes as needed.	
DATA SOURCES The Forest Manager (TFM); PHP & DNRR field audits	COST AND DIFFICULTY Low to Moderate - Dependent on PHP's required level of involvement	
LONG-TERM STRATEGIC MONITORING PROGRAM		
MANAGEMENT OBJECTIVE	Mainland Moose population recovery	
INDICATOR	Population estimates / use of population concentration areas	
MONITORING STRATEGY DNRR is responsible for population inventory and studying habitat use.		
DATA SOURCES Mainland Moose Recovery Team	COST AND DIFFICULTY	

DNRR Biologist Lisa Doucette	Low to High - Dependent on PHP's required level of involvement

FOREST MANAGEMENT PRESCRIPTION

- Moose shelter patches (within 250 metres of the edge of any forest harvest (partial or clearcut) a minimum of two closed canopy coniferous stands > 3 hectares in area)

- The preferred conditions for shelter patches using the NSDNRR forest GIS inventory specifications are:

    - FORNON = 0, and
    - 50-80% softwood, and
    - >= meters height, and
    - crown closure >= 60%

- Moose retention patches (Smaller coniferous must also be retained within each harvest area to provide temporary shelter and concealment)

- Moose buffers (Forested buffers should be retained around and or near open wetlands, watercourses, and waterbodies)

- Roads and access points (Development of roads and improved trails should be avoided where extended extraction trails can be used as an alternative)

- Coarse woody debris (leave tree tops and substantial amounts of woody debris on extraction trails to discourage access)

- Decommission roads to reduce human access

2023 MONITORING UPDATE

1. All harvest treatments within the mainland moose concentration areas for shelter patches and forest cover condition are in compliance with the May 2022 mainland moose SMP as required and approved by NSDNRR.
2. The Mainland Moose Recovery Plan (2007) estimates approximately 1000-1200 individuals on mainland Nova Scotia. This is the most current information available on mainland moose population numbers.
3. The Action Plan for the Recovery of Eastern Moose in Mainland Nova Scotia was released to the public in 2016. A total of 14 actions have been identified which are in different phases of completion. The action items related to the Mainland Moose include increased understanding of genetics, cause of death/illness, long-term monitoring, threats, poaching, translocation feasibility, review and adapt forest management practices as habitat requirements are better understood, public awareness and engagement. In May 2020, DNRR released revised special management practices as a result of the action plan.
4. In relation to the Action Plan, PHP is a partner on a new research study to "develop tools to provide decision support in forest management planning at multiple spatial scales for moose habitat requirements".

5. DNRR has conducted flight surveys and thermal imagery surveys in moose concentration areas but have yet to determine mainland-wide provincial estimates of population size. The government does have outside help to extrapolate the survey results to the broader area, given the use of different methods and a new thermal imagery technique. The DNRR will be appointing a new small recovery team which will assist in updating the current recovery/action plan and provide guidance related to on-going work.

6. On May 24, 2019 the Chronicle Herald newspaper published an article titled "From high overhead, a sobering look at a moose population in deep trouble", which is a summary of survey results mentioned in the previous point. This information was obtained by the CBC to highlight the rapid decline of mainland moose population numbers. **(https://www.cbc.ca/news/canada/nova-scotia/mainland-moose-nova-scotia-decline-1.5148572)**

SUPPORTING DOCUMENTS/REFERENCES

Mainland Moose Special Management Practices, NSDNRR July 2012; Recovery Plan for Mainland Moose in Nova Scotia, March 2007; Action Plan for the Recovery of Eastern Moose in Mainland Nova Scotia 2014-2018

Mainland Moose Concentration, Retention and Bog Buffer Areas

Legend
- Moose Bog Buffer
- Moose Retention Patches
- Moose Concentration Areas
- Licensed Crown

HCV – Canada Lynx Habitat

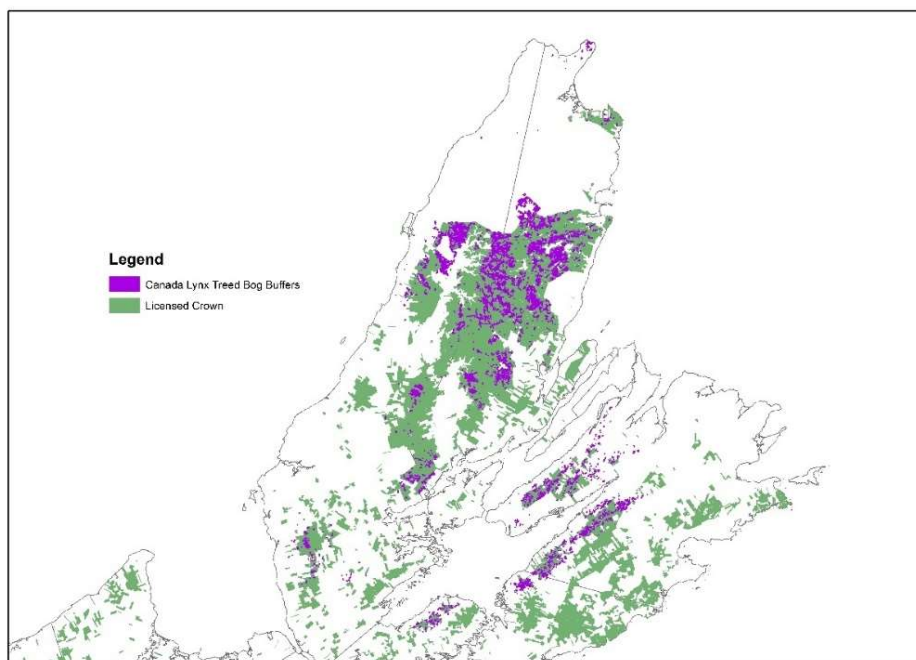| HCV ATTRIBUTE	**Species at Risk – Habitat and Population**	
OPERATIONAL MONITORING PROGRAM		
MANAGEMENT OBJECTIVE	Maintain and/or enhance Canada Lynx habitat	
INDICATOR	Reserve stand structure in lynx bog buffers within harvest areas located throughout the Cape Breton Lynx Range	
MONITORING/REPORTING FREQUENCY Annual	MONITORING STRATEGY Habitat management requirements are implemented through the DNRR approval process for Crown lands. Monitor implementation of stand structure reserve using TFM. Verify annually that special management practices are still current and/or make operational changes as needed.	
DATA SOURCES The Forest Manager (TFM); PHP & DNRR field audits	COST AND DIFFICULTY Low to Moderate - Dependant on PHP's required level of involvement	
LONG-TERM STRATEGIC MONITORING PROGRAM		
MANAGEMENT OBJECTIVE	Canada Lynx population recovery	
INDICATOR	Population estimates / use of treed bog leave areas	
MONITORING STRATEGY DNRR is responsible for population inventory and studying habitat use. A joint project between DNRR and Acadian University is assessing the efficacy of the 100-meter treed bog buffers. The project began in January 2011 and ended in 2015.		
DATA SOURCES Canada Lynx Recovery Team	COST AND DIFFICULTY	

DNRR Biologist Peter Austin-Smith	Low to High - Dependant on PHP's required level of involvement

FOREST MANAGEMENT PRESCRIPTION

- To supplement red squirrel habitat, which is an important food source for lynx, a wider buffer strip of 100 m of unharvested forest should be left around all treed bogs in the Cape Breton lynx range.

- Where possible, decommission secondary, non-main trunk forest access roads following harvest.

- Plan access roads to have dead ends.

- Plan harvesting to allow decommissioning of sectors of road networks.

- Where possible, narrow and orient road right-of-ways to create shade conditions to reduce snow compaction, thereby reducing ease of travel for coyotes.

- Maintain a continuous supply of >50ha patches of mid-regeneration (15-35-year old) conifer dominated habitat that supports high densities of snowshoe hare over each lynx management unit.

- Create a landscape that will maintain a continuous presence of a mosaic of successional stages, especially mid-regeneration patches that will support resident lynx.

- Employ silvicultural techniques that create, maintain, or prolong use of stands by high populations of snowshoe hares.

- Retain coarse woody debris for denning sites.

2023 MONITORING UPDATE

1. The Canada Lynx Recovery Plan is currently under review by the DNRR, Wildlife Division, to identify core habitat areas in the Cape Breton Highlands. Until this review is finalized, all planned harvest treatments within Canada lynx treed bog buffers are prohibited.
2. The Canada Lynx Recovery Strategy (2005) estimates approximately 50-500 individuals in the Cape Breton lynx range. This is the most current information available on Canada lynx population numbers.
3. Some work happening related to habitat issues for both American Marten and Canada Lynx (joint recovery team). Still being developed by DNRR Species at Risk group. Looking to get more funding to do habitat modeling and management issues in CB Highlands. Nothing approved yet; still in discussion phase.
4. DNRR and Acadia University collaborated on a research study in the Cape Breton Highlands from 2013 to 2015. Some results of that work include:
   - 1 km long track surveys were conducted Jan – March 2013-2015 for a total 243.9 km,
   - 87 transects were established between 350 and 500 masl
   - Transects were paired to examine use of SMP buffers with nearby treated stands

- Buffers typically had "natural" stands although some buffer lengths did encounter short sections of treated areas
- The number of lynx tracks were relatively similar between 2013 and 2014 but increased dramatically in 2015 which is believed due to the increase in recorded hare tracks beginning in 2014 and extending into 2015
- All prey species have very similar overall patterns in terms of natural vs treated habitats and buffer vs non-buffer areas
- Marten and coyote exhibit similar habitat use patterns to prey species while lynx exhibit higher use in natural habitat and buffer zones
- Occupancy modelling reveals the highest probability of occupancy for lynx occurs in or near buffers in natural areas. Moving away from buffer areas, the probability of occupancy drops dramatically especially in treated stands
- Lynx will occupy treated areas in buffers but at much lower rate
- Conclusion is buffer zones with natural structure exhibit a much higher occupancy rate for lynx than treated areas even during an expanding population in response to an increased prey base

5. NSDNRR is currently reviewing the draft NS recovery plan for lynx to determine a definition of core habitat under the NS Endangered Species Act. Once completed, that definition will be implemented into the recovery plan.

SUPPORTING DOCUMENTS/REFERENCES

Canada Lynx Special Management Practices NSDNRR July 2012; Lynx Recovery Strategy Feb 2007; Endangered Canada Lynx Proposed Project: Assessing the interim 100 metre buffers around highland bogs, DNRR 2014; DNRR Wildlife Manager Randy Milton, pers. comm. 2018

Canada Lynx Treed Bog Buffer Areas

Legend
- Canada Lynx Treed Bog Buffers
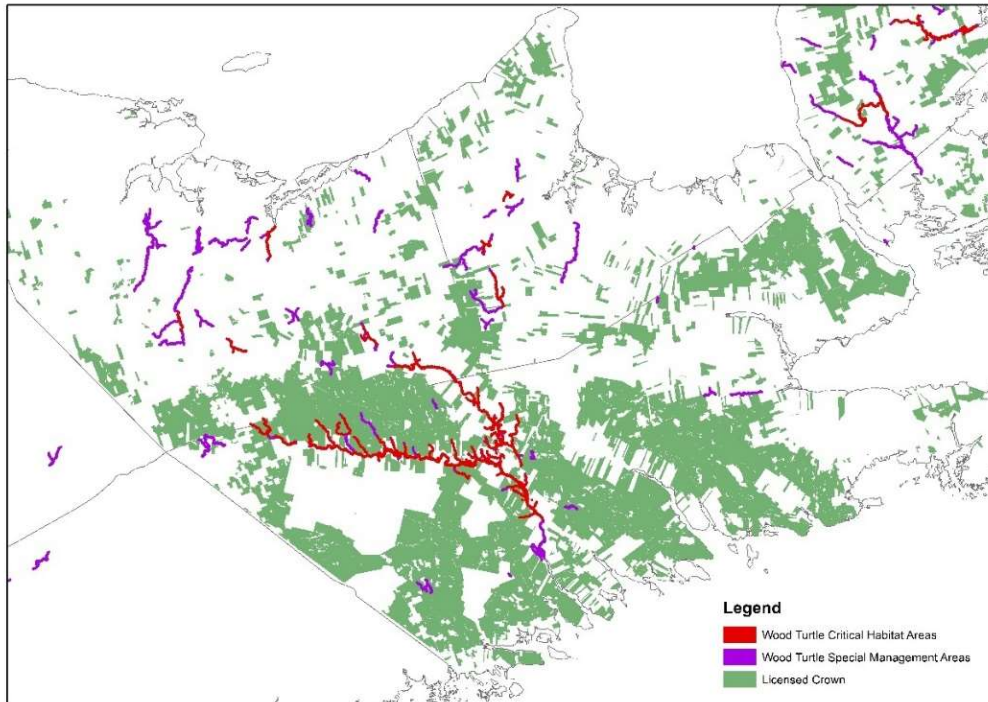- Licensed Crown

HCV – Wood Turtle Habitat

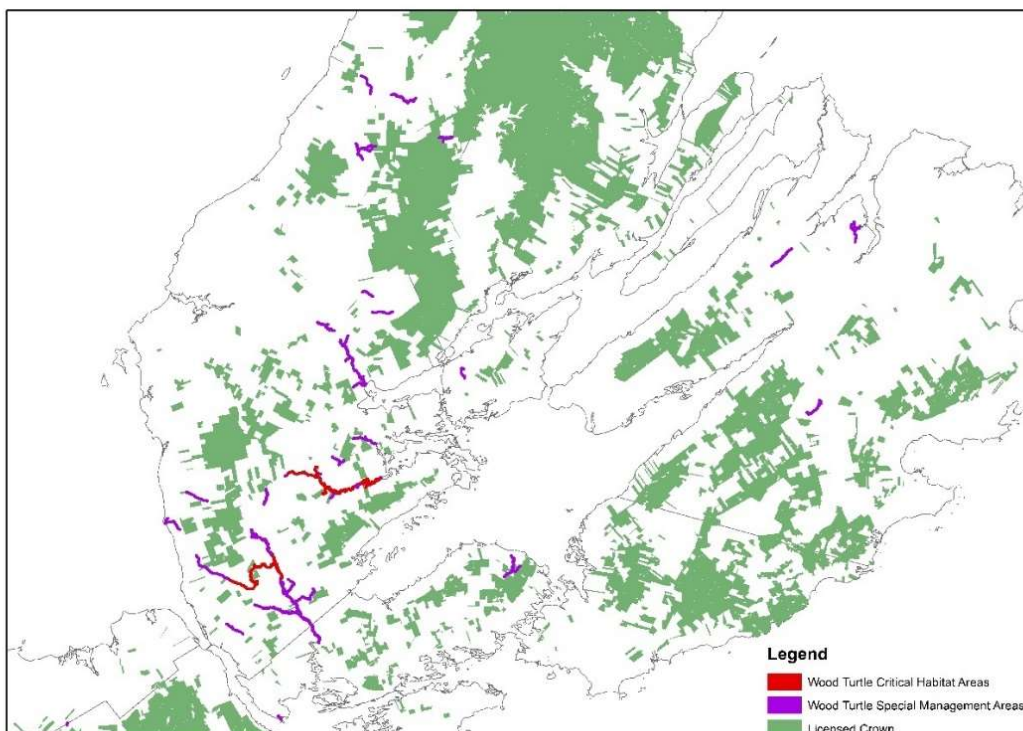| HCV ATTRIBUTE	Species at Risk – Habitat and Population	
OPERATIONAL MONITORING PROGRAM		
MANAGEMENT OBJECTIVE	Maintain and/or enhance Wood Turtle habitat	
INDICATOR	Implementation of temporal and spatial special management practices for wood turtles	
MONITORING/REPORTING FREQUENCY Annual	MONITORING STRATEGY Habitat management requirements are implemented through the DNRR approval process for Crown lands. Monitor implementation of temporal and spatial requirements using TFM. Verify annually that special management practices are still current and/or make operational changes as needed.	
DATA SOURCES The Forest Manager (TFM); PHP & DNRR field audits	COST AND DIFFICULTY Low to Moderate - Dependant on PHP's required level of involvement	
LONG-TERM STRATEGIC MONITORING PROGRAM		
MANAGEMENT OBJECTIVE	Wood Turtle population recovery	
INDICATOR	Population estimates	
MONITORING STRATEGY DNRR is responsible for population inventory and studying habitat use.		

DATA SOURCES	COST AND DIFFICULTY
Wood Turtle Recovery Team	Low to High - Dependant on PHP's required level of involvement

FOREST MANAGEMENT PRESCRIPTION

- Adjust the timing and location of motorized vehicle use for forest management activities to when Wood Turtles are inactive or less likely to be occupying terrestrial habitat (Nov – March)

- Use temporary bridge crossings for perennial streams to avoid altering stream bank, creating erosion and sedimentation, damaging stream bed, and impacting overwintering turtles.

- Forest management roads and landings should not be constructed parallel to watercourses within 200 m of watercourses where wood turtles occur.

- Special management practices for overwintering, nesting, and basking (see DNRR Special Management Practices 2012).

2023 MONITORING UPDATE

1. All harvest treatments within wood turtle habitat zones have the above management prescriptions implemented as approved by DNRR regional staff.
2. The population of wood turtles in PHP's operating area is estimated to be approximately 3,500 individuals (M. Pulsifer, pers. comm., 2013)
3. No changes have been made to the special management practices for wood turtle as issued by DNRR, however, new critical wood turtle habitat areas identified by Environment Canada in 2020 have been incorporated into the provincial wood turtle habitat layer. These new critical wood turtle areas are off-limits to all forest management activities including road building.
4. Monitoring for new locations has not been a funding priority for DNRR, and outside funding has been significantly reduced. A graduate student working on overwintering habitat and communal distribution has just finished his MSc at Acadia. There is nothing significantly different with DNRR's understanding of wood turtle distribution within the watershed.
5. DNRR is not receiving reports of dead turtles that can be linked directly to the forest industry.
6. The final recovery strategy for wood turtle was expected to be released in the latter half of 2019, however it is currently not finalized as of mid-2022.
7. "A wood turtle record of variance was approved earlier this year which has not provided much further clarity on the direction relative to a draft federal Recovery Action Plan. Currently, the federal plan is still draft and also the proposed federal critical habitat is still proposed" (T. Power, pers. Comm, July 2020)
8. DNRR is currently reviewing the Wood Turtle SMP to ensure the federal and provincial habitat areas are appropriately managed. Until this is complete, all federal and provincial habitat areas are prohibited from all forest management activities.

SUPPORTING DOCUMENTS/REFERENCES
Wood Turtle Special Management Practices NSDNRR July 2012; Protecting and Conserving Wood Turtles: A Stewardship Plan for NS, 2003

Wood Turtle Special Management Areas & Critical Habitat - Eastern Mainland

Legend
- Wood Turtle Critical Habitat Areas
- Wood Turtle Special Management Areas
- Licensed Crown

Wood Turtle Special Management Areas & Critical Habitat - Cape Breton

Legend
Wood Turtle Critical Habitat Areas
Wood Turtle Special Management Areas
Licensed Crown

HCV – Bicknell's Thrush Habitat

HCV ATTRIBUTE	Species at Risk – Habitat and Population	
OPERATIONAL MONITORING PROGRAM		
MANAGEMENT OBJECTIVE	Maintain and/or enhance Bicknell's Thrush habitat	
INDICATOR	Implementation of temporal and spatial special management practices for Bicknell's Thrush	
MONITORING/REPORTING FREQUENCY Annual	MONITORING STRATEGY Identify planned pre-commercial thinning activities in Bicknell's Thrush habitat in the	

	Highlands, so field surveys by Bird Studies Canada can first be conducted to identify presence/absence of the bird during their breeding/nesting season (May, June, July). Monitor implementation of leave patches in thinned/cleared areas using a GIS overlay. Verify annually that special management practices are still current and/or make operational changes as needed.
DATA SOURCES The Forest Manager (TFM); PHP and Bird Studies Canada & MTRI field audits	**COST AND DIFFICULTY** Low – Bird Studies Canada has consistently completed Bicknell's Thrush surveys each spring if PHP has pre-commercial thinning activities planned for that summer.

LONG-TERM STRATEGIC MONITORING PROGRAM

MANAGEMENT OBJECTIVE	Bicknell's Thrush population recovery
INDICATOR	Population estimates

MONITORING STRATEGY

Bird Studies Canada annually monitors high elevation bird species through the High Elevation Landbird Program. Since 2002, the Bicknell's Thrush has been monitored in the Cape Breton Highlands to gather critical information about population status and habitat use. Approximately 20 to 30 routes are monitored each June with the continued goal of monitoring long-term trends of the Bicknell's Thrush.

DATA SOURCES	COST AND DIFFICULTY
- Bird Studies Canada - Becky Stewart/Holly Lightfoot - Cape Breton Highlands National Park – Matt Smith - International Bicknell's Thrush Conservation Group (http://www.bicknellsthrush.org/) - High Elevation Landbird Report: 10-year Summary, March 2012	Low – Bird Studies Canada has consistently taken the lead on Bicknell's Thrush habitat and population research.

FOREST MANAGEMENT PRESCRIPTION

- Industrial forest stands that support Bicknell's Thrush should remain un-thinned until the trees are no longer at a successional stage that is suitable for nesting, as determined by further research.

- If clearing, construction and/or thinning in Bicknell's Thrush breeding habitat cannot be avoided, activities should be performed outside of the bird breeding season, before June 1st and after July 31st, to prevent the direct destruction of nests, eggs, nestlings, fledglings or adult birds.

- When forest clearing and thinning in Bicknell's Thrush breeding habitat cannot be avoided, patches of intact forest should be left whenever possible. These patches should:
- cover at least one quarter hectare;
- be located 20 to 50 metres from the uncut or unthinned edge; and
- contain intact undisturbed underbrush.

2023 MONITORING UPDATE

1. A total of 179 hectares of forest stands were treated with variable retention 10%. An additional 162 hectares was commercially thinned. Activities occurred only after August 10th when nests are inactive by the end of July.
2. In the summer of 2023, 20 ARUs (all from PHP) were deployed in the working forest area south of Cape Breton Highlands National Park. Bicknell's were not detected at any sites.
3. PCT will not be undertaken on blocks where BITH was detected, and commercial (mature tree) harvesting will not occur within 300 metres of stands with recent BITH occurrences between April 5th and August 28th. This is all captured in the *Section 16.1: Endangered Species Act Agreement on Forest Silviculture, Harvesting and Roads within Bicknell's Thrush Federal Critical Habitat* issued by the provincial government to PHP.
4. ARU data will be used to better understand habitat needs of Bicknell's Thrush, so appropriate management decisions can be made regarding forest management.
5. The current population estimate for the Bicknell's Thrush in Canada is between 40,570 and 49,258 birds, and it was previously estimated that approximately 1,200 breed in NB and NS (HELP Report, March 2012).
6. No changes have been made to the special management practices for Bicknell's Thrush as issued by Bird Studies Canada.
7. In March 2012, Bird Studies Canada released a 10-year summary report of their High Elevation Landbird Program. The results for Bicknell's Thrush monitoring found that the sampling intensity was not enough to detect statistically significant trends in population and habitat use.
8. In 2012-13, Bird Studies Canada refined HELP, using a Generalized Random Tessalation Stratified sampling design to randomly select routes and increase sampling intensity in Cape Breton, thus enabling them to meet international, national and regional information needs (HELP Report, March 2012).
9. In July 2020, the federal Bicknell's Thrush Recovery Strategy was finalized. The definition of critical habitat for bicknell's thrush is provided for Nova Scotia, which will help guide habitat management for bicknell's thrush in Nova Scotia.

10. On PHP's Crown license area, there are 66 locations in ACCDC's sensitive species dataset dated July 2020 (no change from 2019). These locations range in observation dates from 1987 to 2013 (see below map).

SUPPORTING DOCUMENTS/REFERENCES

Conserving the Bicknell's Thrush: Stewardship and Management Practices for High Elevation Forest, 2009; High Elevation Landbird Program: 10-year Report, March 2012

High Elevation Landbird Program: Annual Report for Cape Breton Highlands National 2013-2014

Bicknell's Thrush Critical Habitat Areas

Legend
- Bicknell's Thrush Location Data - ACCDC
- Bicknell's Thrush Critical Habitat Areas
- Licensed Crown
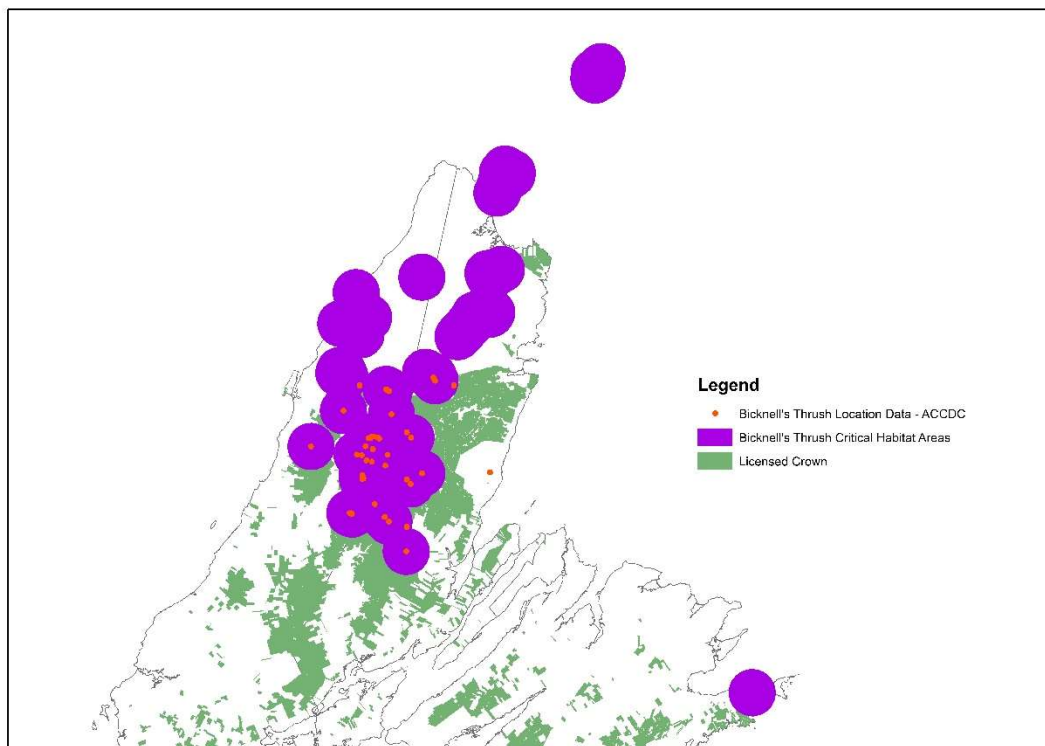
HCV – Rusty Blackbird Habitat

HCV ATTRIBUTE	Species at Risk – Habitat and Population	
OPERATIONAL MONITORING PROGRAM		
MANAGEMENT OBJECTIVE	Maintain and/or enhance Rusty Blackbird habitat	
INDICATOR	Reserve stand structure in Rusty Blackbird habitat	
MONITORING/REPORTING FREQUENCY Annual	MONITORING STRATEGY Monitor implementation of reserve stand structure using field audits. Verify annually that special management practices are still current and/or make operational changes as needed.	
DATA SOURCES The Forest Manager (TFM); PHP field audits	COST AND DIFFICULTY Low – PHP currently monitors for riparian buffer management on its operational field audits	
LONG-TERM STRATEGIC MONITORING PROGRAM		
MANAGEMENT OBJECTIVE	Rusty Blackbird population recovery	
INDICATOR	Population estimates	
MONITORING STRATEGY DNRR is responsible for population inventory and studying habitat use.		
DATA SOURCES NSDNRR	COST AND DIFFICULTY Low to High - Dependent on PHP's required level of involvement	

FOREST MANAGEMENT PRESCRIPTION

- 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.

2023 MONITORING UPDATE

- The population of Rusty Blackbird in Nova Scotia is currently unknown.

- 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). 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 in 2021 have occurred related to at-risk bird known locations.

- PHP is an active funding partner on a research project with Dalhousie University and the Nova Scotia Community College titled "**At-Risk Birds Critical Habitat Modeling for Strategic Planning on Port Hawkesbury Paper's Crown License Lands".** The purpose of the project is to develop and validate species at risk habitat models for various bird species known or predicted to occur in the forest management area. Previous habitat models have been constructed using the current forest inventory data, which is limited in spatial scale and detail, and aggregated at the stand level. The province has acquired topographic LiDAR data and is available for public use. In this project, we will attempt to extract relevant metrics (based on expert opinion and literature) of the forest structure from the LiDAR point cloud data in addition to other variables (topography, climate etc.) to develop a new habitat model that will be validated by field visits. The habitat models, once validated for accuracy, will be incorporated into PHP's long-term planning model and planning process to ensure adequate habitat characteristics are maintained across the landscape over time.

Habitat models are being developed for the below at-risk birds:

    Canada Warbler
    Rusty Blackbird
    Eastern Wood Pewee
    Olive-sided Flycatcher
    Evening Grosbeak
    Common Nighthawk

- 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, including Rusty blackbird. 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).
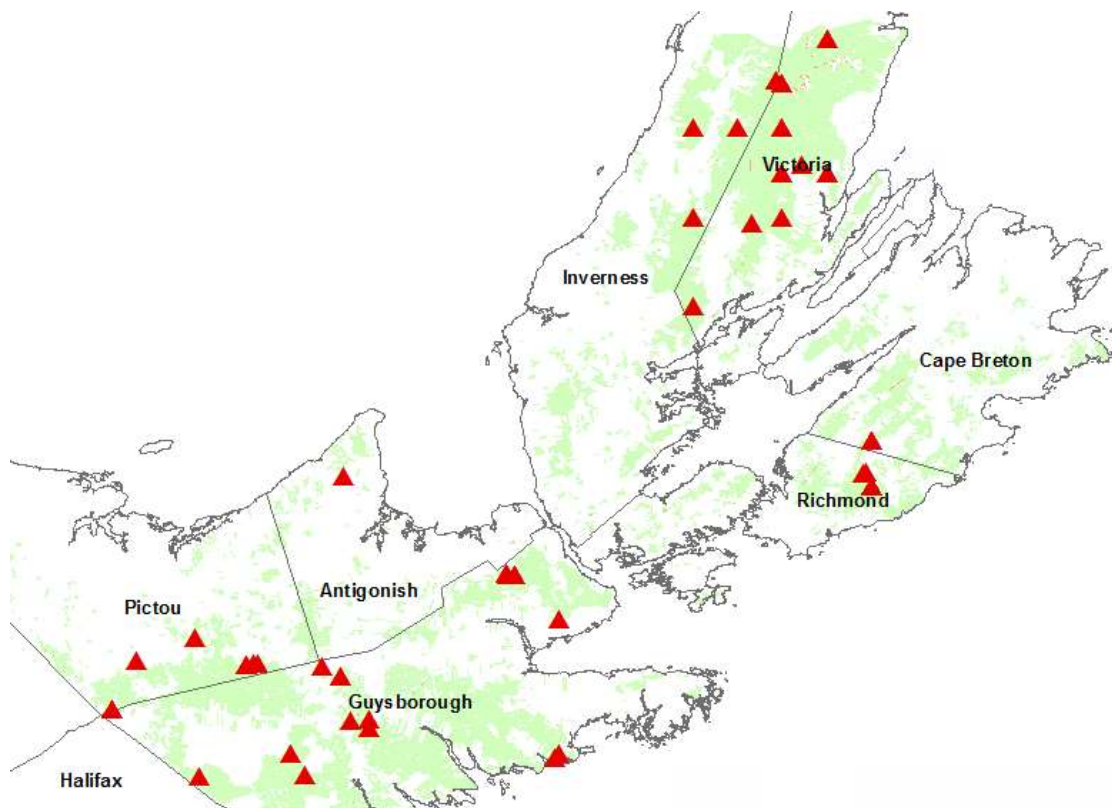
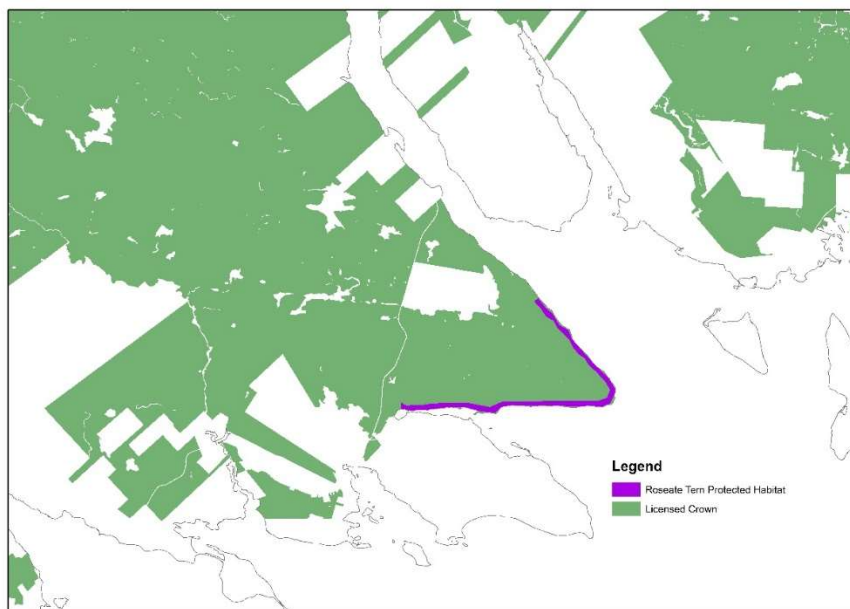## SUPPORTING DOCUMENTS/REFERENCES

COSEWIC assessment and status report on the Rusty Blackbird *Euphagus carolinus* in Canada (2006)

HCV – Roseate Tern Habitat

HCV ATTRIBUTE	Species at Risk – Habitat

OPERATIONAL MONITORING PROGRAM	

MANAGEMENT OBJECTIVE	Maintain Roseate Tern Habitat
INDICATOR	Reserve stand structure in Roseate Tern habitat

MONITORING/REPORTING FREQUENCY	MONITORING STRATEGY
Annual	Maintain a 200-meter buffer zone along the coast at Fisherman's Harbour. Within this buffer zone, no management will occur.

DATA SOURCES	COST AND DIFFICULTY
The Forest Manager (TFM)	Low – PHP does not conduct forest management activities within the 200-meter buffer zone.

FOREST MANAGEMENT PRESCRIPTION
- PHP does not conduct forest management activities within the 200-meter buffer zone at Fisherman's Harbour. - Other critical habitat for the Roseate Tern is located on offshore islands.

2023 MONITORING UPDATE
A GIS overlay using completed harvest treatment data from 2020 shows that there have been no forest management activities within the 200-meter buffer zone at Fisherman's Harbour.

Roseate Tern Protected Habitat - Fishermans Harbour, Guysborough County

SUPPORTING DOCUMENTS/REFERENCES
Roseate Tern Recovery Strategy 2006

HCV – Olive-Sided Flycatcher Habitat

HCV ATTRIBUTE	Species at Risk – Habitat	
OPERATIONAL MONITORING PROGRAM		
MANAGEMENT OBJECTIVE	Olive-sided Flycatcher Habitat	
INDICATOR	Reserve stand structure in Olive-sided flycatcher habitat	
MONITORING/REPORTING FREQUENCY Annual	MONITORING STRATEGY Monitor COSEWIC and NSDNRR's websites for recovery strategies, actions plans, and/or	

	special management practices developed for this species.
DATA SOURCES ACCDC	COST AND DIFFICULTY Low – PHP does not yet implement SMP's

FOREST MANAGEMENT PRESCRIPTION

The habitat characteristics of olive-sided flycatcher are minimally impacted by forestry activities due to where they typically inhabit. The species prefers tall snags or residual trees for perching and foraging. PHP leaves snags throughout its operations and the presence of tall trees can be found in several PHP silviculture treatments (e.g. single selection, group selection, partial cuts, shelterwoods, patch cuts, red spruce management). PHP also provides habitat features such as forest edges, openings, and clearcuts, and spruce and fir trees are preferred nest sites. Understory thinning may also enhance foraging opportunities. Currently, no special management practices exist for this species, but once developed PHP will implement them as applicable to forest management. If an active nest is located during regular operational activities, the activity will be stopped and the local DNRR Wildlife Biologist will be notified so appropriate measures can be implemented.

2023 MONITORING UPDATE

A recovery strategy for Olive-sided Flycatcher was finalized by COSEWIC in March 2016.

Regarding critical habitat for this species, the recovery strategy states:

"The available information is not adequate to enable the identification of critical habitat at the landscape scale for the following reasons:

- *There is a lack of understanding and data to indicate the suitable configuration of important landscape biophysical attributes.*
- *Habitat requirements may vary across the range of the species. Management units (i.e., geographic units within which critical habitat would be managed) need to be identified in such a way to best reflect variation in habitat use.*
- *There is a lack of data related to Olive-sided Flycatcher presence and abundance in large portions of its range. Without this information any model used to predict critical habitat with current data may have a limited ability to do so in these areas.*
- *For Olive-sided Flycatcher, it is unknown whether certain habitats with specific biophysical attributes may be functionally more important than others. For example, specific habitats may have greater densities of individuals or pairs and/or result in higher reproductive success. There are few data regarding the relative importance of suitable habitat types for Olive-sided Flycatcher population numbers and indices of habitat quality.*
- *The relationships between anthropogenic disturbance and habitat quality are poorly known. A better understanding of these relationships is needed to ensure sufficient*

suitable habitat is available for Olive-sided Flycatcher and to identify at what scale and intensity activities would be likely to destroy the critical habitat.

A Schedule of Studies (Table 4) has been developed to provide the information necessary to identify the critical habitat that will be sufficient to meet the population and distribution objectives. The identification of critical habitat will be included in a revised recovery strategy or an action plan."

- On PHP's Crown license area, there are 225 locations in ACCDC's sensitive species dataset dated May 2022. All locations range in observation dates from 1987 to 2020 (see below map). Deferral of management activities 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 in 2021 have occurred related to at-risk bird known locations.

- PHP is an active funding partner on a research project with Dalhousie University and the Nova Scotia Community College titled "At-Risk Birds Critical Habitat Modeling for Strategic Planning on Port Hawkesbury Paper's Crown License Lands". The purpose of the project is to develop and validate species at risk habitat models for various bird species known or predicted to occur in the forest management area. Previous habitat models have been constructed using the current forest inventory data, which is limited in spatial scale and detail, and aggregated at the stand level. The province has acquired topographic LiDAR data and is available for public use. In this project, we will attempt to extract relevant metrics (based on expert opinion and literature) of the forest structure from the LiDAR point cloud data in addition to other variables (topography, climate etc.) to develop a new habitat model that will be validated by field visits. The habitat models, once validated for accuracy, will be incorporated into PHP's long-term planning model and planning process to ensure adequate habitat characteristics are maintained across the landscape over time.

Habitat models are being developed for the below at-risk birds:

    Canada Warbler
    Rusty Blackbird
    Eastern Wood Pewee
    Olive-sided Flycatcher
    Evening Grosbeak
    Common Nighthawk

- 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, including Olive-sided flycatcher. 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).

SUPPORTING DOCUMENTS/REFERENCES
COSEWIC Website; ACCDC Data
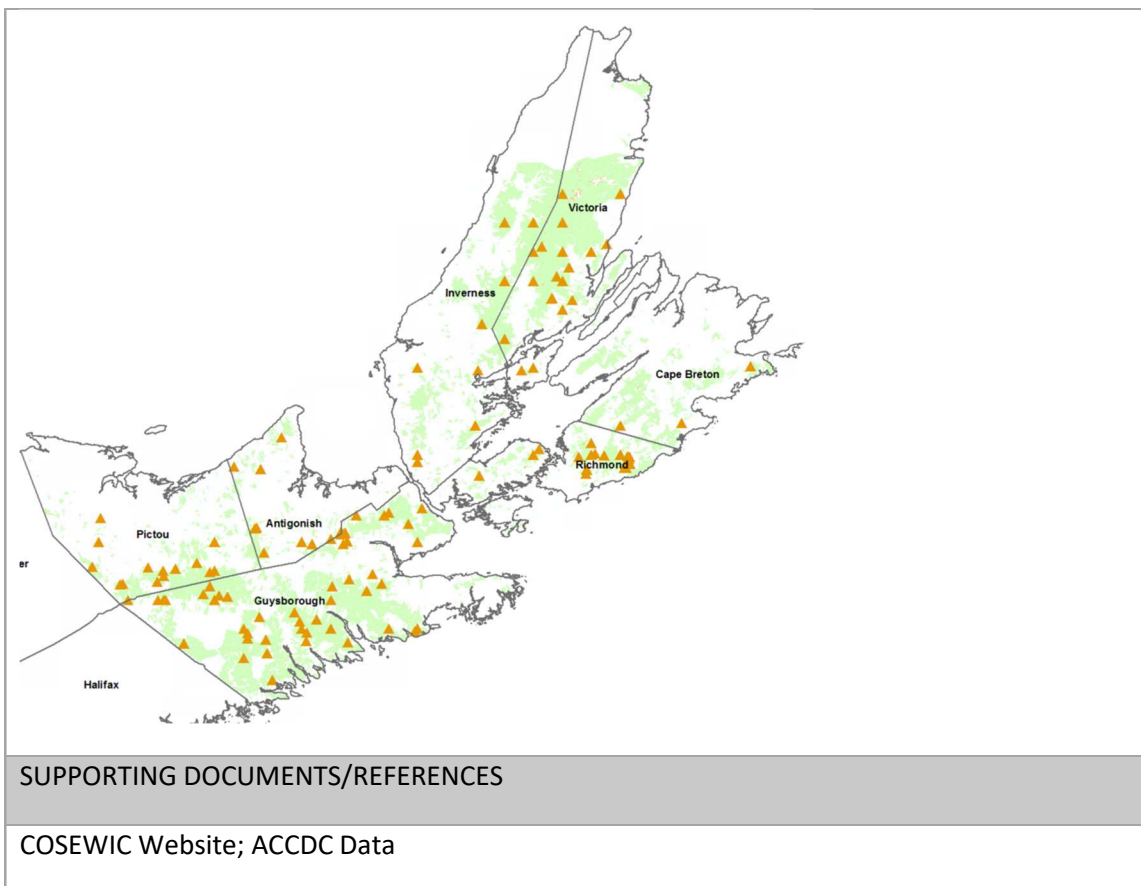
HCV – Eastern Whip-Poor-Will Habitat

HCV ATTRIBUTE	Species at Risk – Habitat
OPERATIONAL MONITORING PROGRAM	
MANAGEMENT OBJECTIVE	Eastern Whip-poor-will Habitat
INDICATOR	Reserve stand structure in Eastern Whip-poor-will habitat
MONITORING/REPORTING FREQUENCY Annual	Monitor COSEWIC and NSDNRR's websites for recovery strategies, actions plans, and/or special management practices developed for this species.

DATA SOURCES	COST AND DIFFICULTY
ACCDC	Low – PHP does not yet implement SMP's

FOREST MANAGEMENT PRESCRIPTION
The habitat characteristics of whip-poor-will are minimally impacted by forestry activities due to where they typically inhabit. PHP creates forest edges and openings through active management, as well as even-aged stands that can contain well-spaced trees. This species may also use barrens or regenerating forests following a disturbance, which are present across PHP's operating area. Currently, no special management practices exist for this species, but once developed PHP will implement them as applicable to forest management. If an active nest is located during regular operational activities, the activity will be stopped and the local DNRR Wildlife Biologist will be notified so appropriate measures can be implemented.

2023 MONITORING UPDATE
A COSEWIC recovery strategy was finalized for this species in 2018. There are no locations of Eastern Whip-poor-will in ACCDC's May 2022 dataset. - 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, including Eastern Whip-poor-will. 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).

SUPPORTING DOCUMENTS/REFERENCES
COSEWIC Website; ACCDC Data

HCV – Eastern Wood Peewee Habitat

HCV ATTRIBUTE	Species at Risk – Habitat
OPERATIONAL MONITORING PROGRAM	
MANAGEMENT OBJECTIVE	Eastern Wood Peewee Habitat
INDICATOR	Reserve stand structure in Eastern wood peewee habitat

MONITORING/REPORTING FREQUENCY Annual	MONITORING STRATEGY Monitor COSEWIC and NSDNRR's websites for recovery strategies, actions plans, and/or special management practices developed for this species.
DATA SOURCES ACCDC	COST AND DIFFICULTY Low – PHP does not yet implement SMP's

FOREST MANAGEMENT PRESCRIPTION

The Eastern wood peewee can be impacted by forest management activities since this species of bird prefers mature and intermediate age stands of deciduous and mixed forests. However, PHP manages the forest management area by creating a range of age classes through forest modeling, long-term planning, and operational planning. Also, PHP manages deciduous and mixed forest stands with a variety of harvest treatments that can still maintain adequate forest structure and large mature trees for nesting and perching (e.g. single selection, group selection, partial cuts, shelterwoods, patch cuts).

Forestry practices that maintain large tracts of intermediate aged forest with closed canopy and limited clear cuts (less than 10 ha) along with thinning to remove mature trees and large-diameter woody growth should provide adequate habitat for Eastern Wood-Peewees (Stauffer and Best 1980, Crawford et al. 1981).

Currently, no special management practices exist for this species, but once developed PHP will implement them as applicable to forest management. If an active nest is located during

regular operational activities, the activity will be stopped and the local DNRR Wildlife Biologist will be notified so appropriate measures can be implemented.

2023 MONITORING UPDATE

Currently, there is no recovery strategy, action plan and/or special management practices issued by either COSEWIC or NSDNRR.
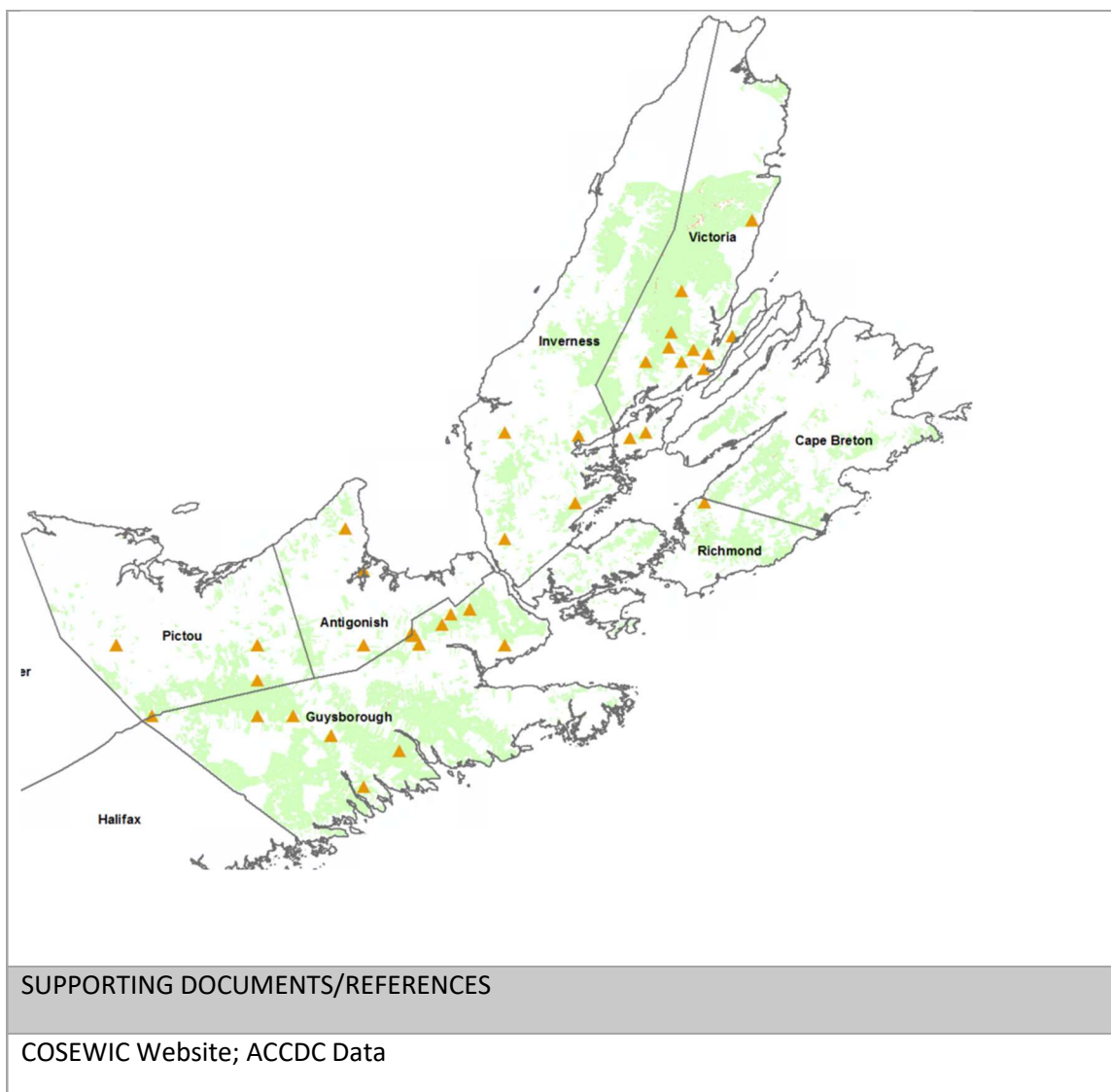
On PHP's Crown license area, there are 55 locations in ACCDC's sensitive species dataset from May 2022. Observation dates range from 1986 to 2020 (see below map). Deferral of management activities during the breeding season of May to August may occur depending on data quality, year of original sighting, and input from regional NSDNRR biologists. Deferral of management activities in 2021 have occurred related to at-risk bird known locations.

- PHP is an active funding partner on a research project with Dalhousie University and the Nova Scotia Community College titled "At-Risk Birds Critical Habitat Modeling for Strategic Planning on Port Hawkesbury Paper's Crown License Lands". The purpose of the project is to develop and validate species at risk habitat models for various bird species known or predicted to occur in the forest management area. Previous habitat models have been constructed using the current forest inventory data, which is limited in spatial scale and detail, and aggregated at the stand level. The province has acquired topographic LiDAR data and is available for public use. In this project, we will attempt to extract relevant metrics (based on expert opinion and literature) of the forest structure from the LiDAR point cloud data in addition to other variables (topography, climate etc.) to develop a new habitat model that will be validated by field visits. The habitat models, once validated for accuracy, will be incorporated into PHP's long-term planning model and planning process to ensure adequate habitat characteristics are maintained across the landscape over time.

Habitat models are being developed for the below at-risk birds:

> Canada Warbler
> Rusty Blackbird
> Eastern Wood Pewee
> Olive-sided Flycatcher
> Evening Grosbeak
> Common Nighthawk

- 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, including Eastern Wood Pewee. 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).

SUPPORTING DOCUMENTS/REFERENCES
COSEWIC Website; ACCDC Data

HCV – Canada Warbler Habitat

HCV ATTRIBUTE	Species at Risk – Habitat
OPERATIONAL MONITORING PROGRAM	
MANAGEMENT OBJECTIVE	Canada Warbler Habitat
INDICATOR	Reserve stand structure in Canada warbler habitat

MONITORING/REPORTING FREQUENCY	MONITORING STRATEGY
Annual	Monitor COSEWIC and NSDNRR's websites for recovery strategies, actions plans, and/or special management practices developed for this species.
DATA SOURCES	COST AND DIFFICULTY
ACCDC	Low – PHP does not yet implement SMP's

FOREST MANAGEMENT PRESCRIPTION

The habitat characteristics of Canada warbler are minimally impacted by forestry activities due to where they typically inhabit. PHP creates regenerating stand structures and forest edge through active management, which is preferred by this species, but also avoid steep slope areas, ravines, swamps, and bogs. The provision of stumps and coarse woody debris left by PHP is also believed to create understory conditions preferred by the Canada warbler. Furthermore, PHP does not contribute to habitat loss by converting swamp forests to agricultural land. Currently, no special management practices exist for this species, but once developed PHP will implement them as applicable to forest management. If an active nest is located during regular operational activities, the activity will be stopped and the local DNRR Wildlife Biologist will be notified so appropriate measures can be implemented.

2023 MONITORING UPDATE

A COSEWIC recovery strategy was finalized for Canada Warbler in March 2016.

Regarding critical habitat for this species, the recovery strategy states:

"The available information is not adequate to identify critical habitat at a landscape scale for the following reasons:

• There is a lack of understanding and data to indicate the appropriate configuration of important landscape biophysical attributes.
• Habitat requirements may vary across the range of the species. Management units (i.e., geographic units within which critical habitat would be managed) need to be identified in such a way to best reflect variation in habitat use and management patterns.
• There is a lack of data related to Canada Warbler presence and abundance in large portions of its range. Without this information any model used to predict critical habitat with current data may have a limited ability to do so in these areas.
• For Canada Warbler, it is unclear whether certain habitats with specific biophysical attributes may be functionally more important than others. For example, specific habitats may have greater densities of individuals or pairs and/or result in higher reproductive success.
• The relationships between anthropogenic disturbance and habitat quality are poorly known. A better understanding of these relationships is needed to ensure sufficient suitable habitat is available for Canada Warbler and to identify at what scale and intensity activities would be likely to destroy the critical habitat.
A Schedule of Studies has been developed to provide the information necessary to identify the critical habitat that will be sufficient to meet the population and distribution objectives. The identification of critical habitat will be included in a revised recovery strategy or an action plan.

On PHP's Crown license area, there are 159 locations in ACCDC's sensitive species dataset from May 2022. Observation dates range from 1987 to 2021 (see below map). Deferral of management activities 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 in 2021 have occurred related to at-risk bird known locations.

- PHP is an active funding partner on a research project with Dalhousie University and the Nova Scotia Community College titled "At-Risk Birds Critical Habitat Modeling for Strategic Planning on Port Hawkesbury Paper's Crown License Lands". The purpose of the project is to develop and validate species at risk habitat models for various bird species known or predicted to occur in the forest management area. Previous habitat models have been constructed using the current forest inventory data, which is limited in spatial scale and detail, and aggregated at the stand level. The province has acquired topographic LiDAR data and is available for public use. In this project, we will attempt to extract relevant metrics (based on expert opinion and literature) of the forest structure from the LiDAR point cloud data in addition to other variables (topography, climate etc.) to develop a new habitat model that will be validated by field visits. The habitat models, once validated for accuracy, will be incorporated into PHP's long-term planning model and planning process to ensure adequate habitat characteristics are maintained across the landscape over time.

Habitat models are being developed for the below at-risk birds:

Canada Warbler
Rusty Blackbird
Eastern Wood Pewee
Olive-sided Flycatcher
Evening Grosbeak
Common Nighthawk

- 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, including Canada Warbler. 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**).
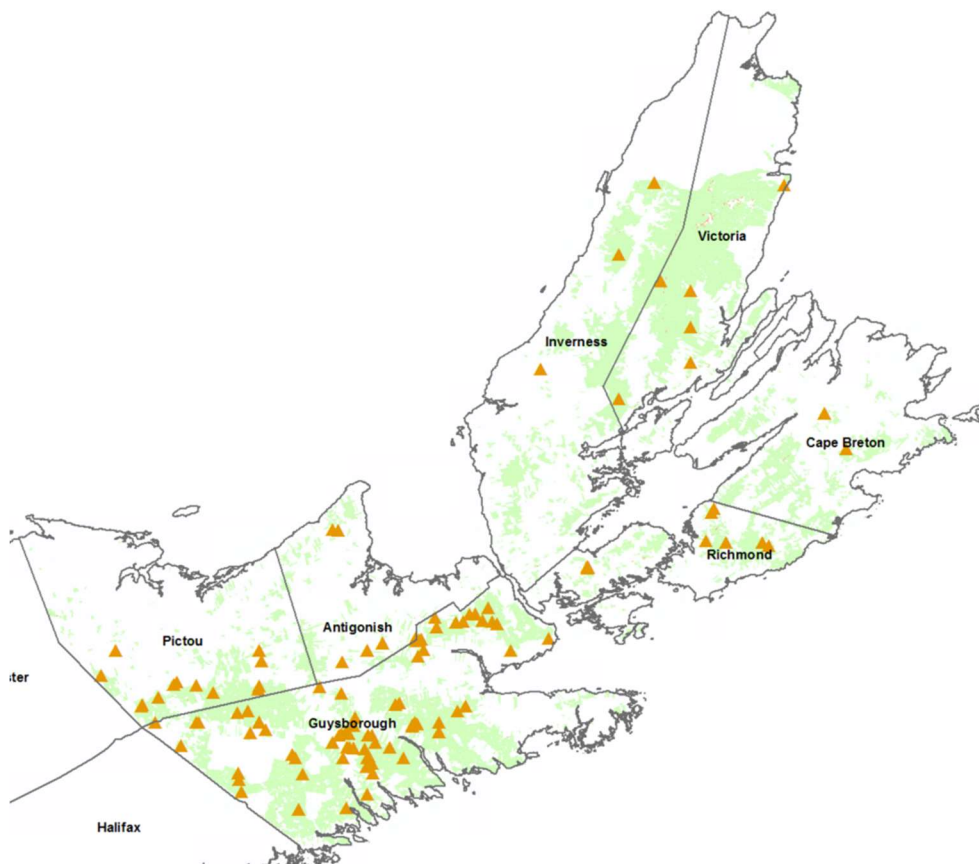
SUPPORTING DOCUMENTS/REFERENCES

COSEWIC Website; ACCDC Data

HCV – CHIMNEY SWIFT Habitat

HCV ATTRIBUTE	**Species at Risk – Habitat**

| OPERATIONAL MONITORING PROGRAM ||

MANAGEMENT OBJECTIVE	Chimney Swift Habitat
INDICATOR	Reserve stand structure in Chimney swift habitat

MONITORING/REPORTING FREQUENCY Annual	MONITORING STRATEGY Monitor COSEWIC and NSDNRR's websites for recovery strategies, actions plans, and/or special management practices developed for this species.
DATA SOURCES ACCDC	COST AND DIFFICULTY Low – PHP does not yet implement SMP's

| FOREST MANAGEMENT PRESCRIPTION ||

The Chimney swift can be impacted by forest management activities since this species of bird may nest in wooded areas with large diameter trees. Current management practices such as group and single selection implemented by PHP in shade-tolerant hardwood stands provides large-diameter trees as part of the forest cover for roosting and nest sites. Additionally, the old-growth forest protocol implemented by NSDNRR is increasing the amount of protected old-growth mature and climax hardwood forests, which is beneficial for the Chimney Swift as well as many other bird species. Currently, there are no special management practices identified for forest managers regarding Chimney swift habitat. Additionally, feeding and nesting habitat relies heavily on urban and suburban areas where there is an abundance of chimneys for nesting, so PHP believes it currently has a low impact on Chimney swift populations.

2023 MONITORING UPDATE

Currently, there is no recovery strategy, action plan and/or special management practices issued by either COSEWIC or NSDNRR.

On PHP's Crown license area, there are 16 locations in ACCDC's sensitive species dataset from May 2022. These locations range in observation dates from 1986 to 2011 (see below map). Deferral of management activities during the breeding season of May to August may occur depending on data quality, year of original sighting, and input from regional NSDNRR biologists.

- 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, including Chimney swift. 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).
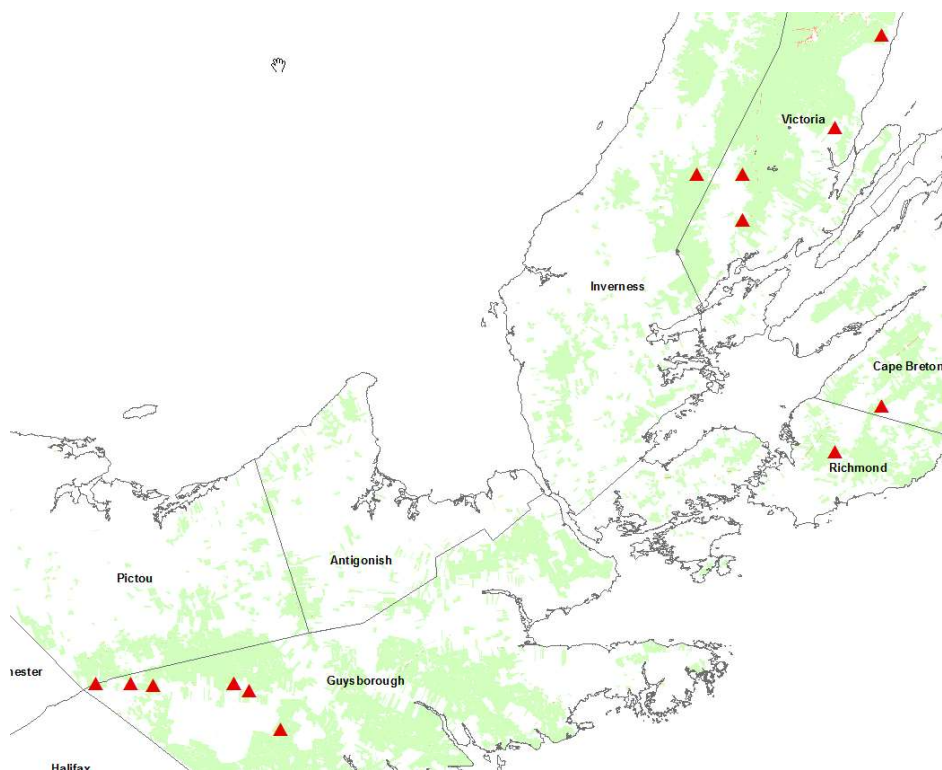
SUPPORTING DOCUMENTS/REFERENCES

COSEWIC Website; ACCDC Data

HCV – COMMON NIGHTHAWK Habitat

HCV ATTRIBUTE	Species at Risk – Habitat	
OPERATIONAL MONITORING PROGRAM		
MANAGEMENT OBJECTIVE	Common Nighthawk Habitat	
INDICATOR	Reserve stand structure in Common nighthawk habitat	
MONITORING/REPORTING FREQUENCY Annual	MONITORING STRATEGY Monitor COSEWIC and NSDNRR's websites for recovery strategies, actions plans, and/or special management practices developed for this species.	
DATA SOURCES ACCDC	COST AND DIFFICULTY Low – PHP does not yet implement SMP's	
FOREST MANAGEMENT PRESCRIPTION		
The Common Nighthawk prefers some habitats where PHP does not operate such as rocky areas, sandy areas, and wetlands. However, they do prefer open wooded areas, which PHP does create through its forest management (e.g. clearcuts, partial cuts, shelterwoods, selection cuts). The Common Nighthawk Recovery Strategy lists a variety of threats including changes in natural processes, climate and natural disasters, accidental mortality, pollution, exotic or invasive species, and habitat loss or degradation. Types of habitat loss include change in roof construction and materials, residential and commercial development, agriculture, and logging and wood harvesting. It is currently unknown if logging and wood harvesting causes a significant severity to populations with a low causal certainty that there is a high degree of evidence linked to the threat of logging. Regardless, PHP provides habitat conditions for the Common Nighthawk through its forest management and does not apply pesticides which can impact foraging areas near nest patches.		

2023 MONITORING UPDATE

COSEWIC finalized a recovery strategy for the Common Nighthawk in March 2016.

Regarding critical habitat for this species, the recovery strategy states:

"The available information is not adequate to enable the identification of critical habitat for the following reasons:
• There is a lack of understanding and data to indicate the appropriate biophysical attributes required by the species and their configuration at a landscape scale.
• Habitat requirements may vary across the range of the species. Management units (i.e., geographic units within which critical habitat would be managed) need to be identified in such a way to best reflect variation in habitat use and land planning processes.
• There is a lack of data related to presence, site usage where detected (e.g., foraging, roosting, defending a territory, nesting, transiting), and abundance in large portions of the species' range and the northern limit of the species' range is unknown. Without this information any model used to predict critical habitat with current data may have a limited ability to do so.
• For Common Nighthawk, it is unknown whether certain habitats with specific biophysical attributes may be functionally more important than others. For example, specific habitats may have greater densities of individuals or pairs and/or result in higher reproductive success.
• The relationships between anthropogenic disturbance and habitat quality are poorly known. A better understanding of these relationships is needed to ensure sufficient suitable habitat is currently available for Common Nighthawk and to identify at what scale and intensity activities would be likely to destroy critical habitat.

Locating nests is difficult and determining general nesting locations is problematic using typical point-count survey methodology. Common Nighthawks defend a large area and their foraging habitats can be separated from nest sites by many kilometers, so it is not possible to determine how an individual is using the habitat where it is detected (e.g., foraging, defending a territory, transiting). Furthermore, traditional point-count survey methodology in the morning is not appropriate for this crepuscular species (Government of Alberta 2013; Saskatchewan Ministry of Environment 2014).
A schedule of studies has been developed to provide the information necessary to identify the critical habitat that will be sufficient to meet the population and distribution objectives. The identification of critical habitat will be included either in a revised recovery strategy or an action plan."

On PHP's Crown license area, there are 43 locations in ACCDC's sensitive species dataset from May 2022. Observation dates range from 2006 to 2021 (see below map). The location documented in 2019 was not near any on-going or planned harvest, however a planting was undertaken in a stand nearby. Deferral of management activities during the breeding season of May to August may occur depending on data quality, year of original sighting, and input from regional NSDNRR biologists.
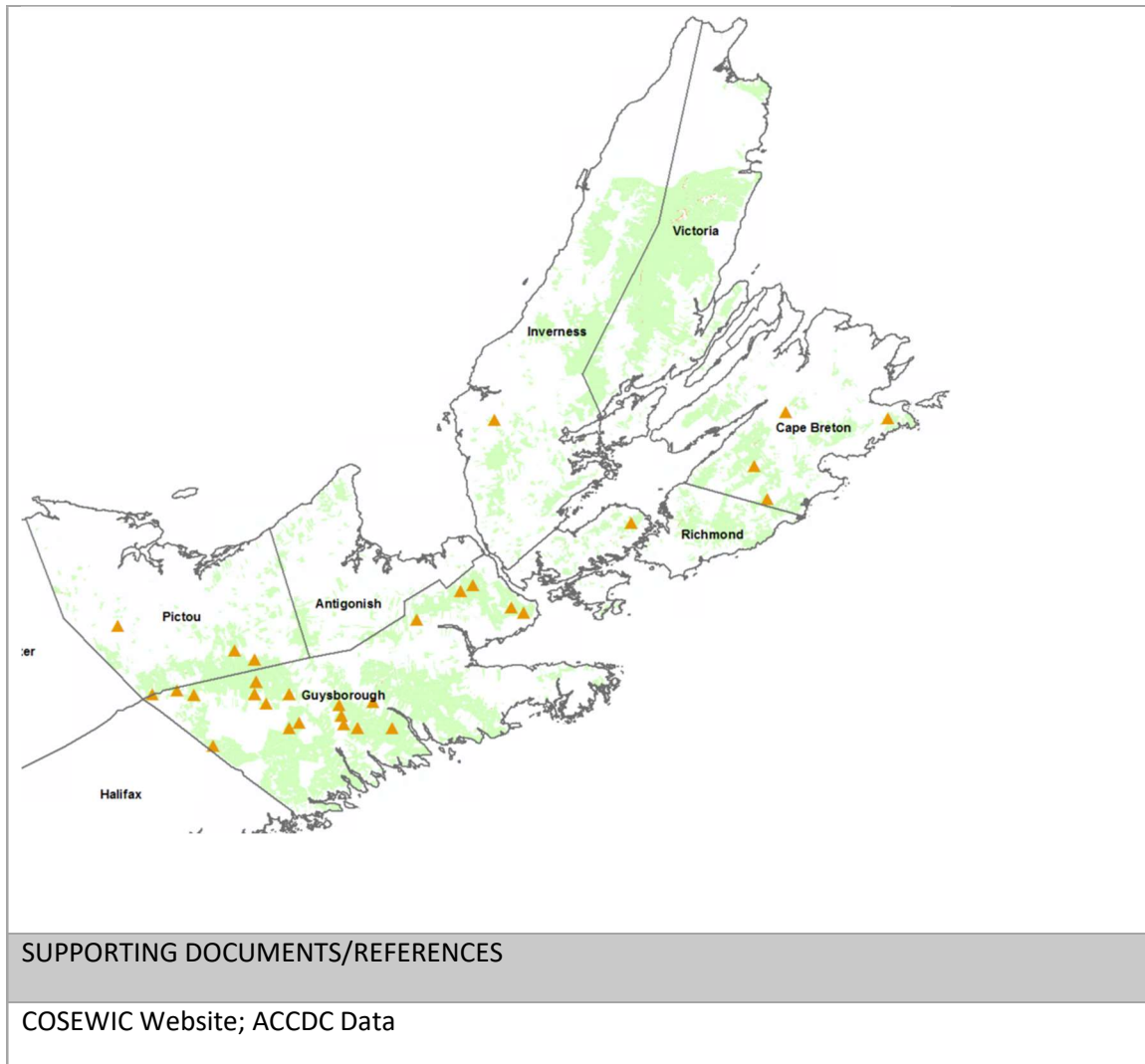
- PHP is an active funding partner on a research project with Dalhousie University and the Nova Scotia Community College titled "At-Risk Birds Critical Habitat Modeling for Strategic Planning on Port Hawkesbury Paper's Crown License Lands". The purpose of the project is to

develop and validate species at risk habitat models for various bird species known or predicted to occur in the forest management area. Previous habitat models have been constructed using the current forest inventory data, which is limited in spatial scale and detail, and aggregated at the stand level. The province has acquired topographic LiDAR data and is available for public use. In this project, we will attempt to extract relevant metrics (based on expert opinion and literature) of the forest structure from the LiDAR point cloud data in addition to other variables (topography, climate etc.) to develop a new habitat model that will be validated by field visits. The habitat models, once validated for accuracy, will be incorporated into PHP's long-term planning model and planning process to ensure adequate habitat characteristics are maintained across the landscape over time.

Habitat models are being developed for the below at-risk birds:

Canada Warbler
Rusty Blackbird
Eastern Wood Pewee
Olive-sided Flycatcher
Evening Grosbeak
Common Nighthawk

- 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, including Common nighthawk. 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).

SUPPORTING DOCUMENTS/REFERENCES
COSEWIC Website; ACCDC Data

HCV – WOOD THRUSH Habitat

HCV ATTRIBUTE	Species at Risk – Habitat
OPERATIONAL MONITORING PROGRAM	

MANAGEMENT OBJECTIVE	Wood Thrush Habitat
INDICATOR	Reserve stand structure in Wood thrush habitat

MONITORING/REPORTING FREQUENCY	MONITORING STRATEGY
Annual	Monitor COSEWIC and NSDNRR's websites for recovery strategies, actions plans, and/or special management practices developed for this species.
DATA SOURCES ACCDC	COST AND DIFFICULTY Low – PHP does not yet implement SMP's

FOREST MANAGEMENT PRESCRIPTION

Currently, there are no required management practices for Wood Thrush in Nova Scotia or Canada. Regardless, given the preferred breeding habitat of Wood Thrush in mature deciduous and mixed-wood forests, PHP believes its uneven-aged and mixed-wood forest management techniques in these forest types do not greatly impact the breeding requirements of the Wood Thrush. The COSEWIC 2012 report supports this notion by stating that "the species is relatively tolerant of forest management activities that are conducted on a small spatial scale (i.e. single-tree, group selection cuts, uneven-age forest management, selective removal of mature trees). The report further states that Sugar Maple and American Beech are preferred species for nesting. PHP manages tolerant Sugar Maple stands using only single or group selection depending on tree quality. American Beech is present throughout the forest management area and pure stands are not managed, but if found dispersed throughout a hardwood stand, it is managed as necessary to meet the forest management prescription. Additionally, PHP does not apply herbicides in its forest

management area, which allows for the continued natural growth of deciduous trees and shrubs in forest stands.

2023 MONITORING UPDATE

Currently, there is no recovery strategy, action plan and/or special management practices issued by either COSEWIC or NSDNRR.

On PHP's Crown license area, there are 2 locations in ACCDC's sensitive species dataset from May 2022 (no change from 2019). These locations range in observation dates from 2008 to 2009 (see below map). Deferral of management activities during the breeding season of May to August may occur depending on data quality, year of original sighting, and input from regional NSDNRR biologists.

SUPPORTING DOCUMENTS/REFERENCES

COSEWIC Website; ACCDC Data

HCV – EVENING GROSBEAK Habitat

HCV ATTRIBUTE	Species at Risk – Habitat
OPERATIONAL MONITORING PROGRAM	
MANAGEMENT OBJECTIVE	Evening Grosbeak Habitat
INDICATOR	Reserve stand structure in Evening Grosbeak habitat

MONITORING/REPORTING FREQUENCY	MONITORING STRATEGY
Annual	Monitor COSEWIC and NSDNRR's websites for recovery strategies, actions plans, and/or special management practices developed for this species.
DATA SOURCES	**COST AND DIFFICULTY**
ACCDC	Low – PHP does not yet implement SMP's

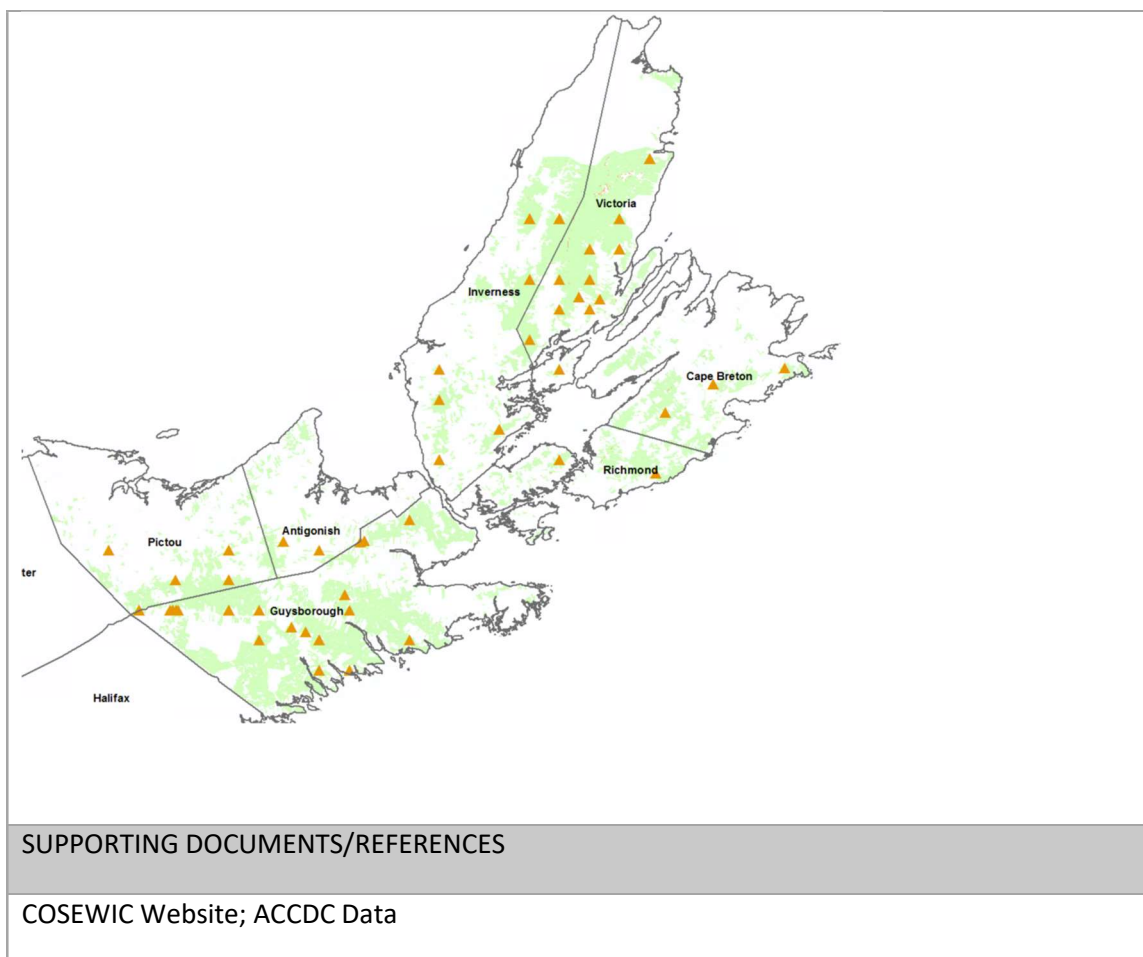| FOREST MANAGEMENT PRESCRIPTION |
|---|
| Currently, there are no required management practices for Evening Grosbeak in Nova Scotia or Canada. Regardless, given the preferred breeding habitat of Evening Grosbeak in large mature and old mixedwood forest stands, PHP may have an impact on the breeding success of Evening Grosbeak. Fluctuations of spruce budworm populations are likely a key factor in fluctuations of Evening Grosbeak populations. Other known threats include window strike mortality in winter, reduction of mature and old-growth mixedwood forests, and road collision mortality. On a large landscape scale, PHP manages the forest land-base to ensure a diversity of stand types and ages, which includes mature and old mixedwood stands. Currently, PHP is actively involved in assessing mature and old forest stands for old-growth protection under the provincial Old Forest Policy. Where stands meet the Old Forest Policy stand definition, measures are put in place to allocate the stand as protected under the Old Forest Policy which will benefit Evening Grosbeak habitat. In 2019, 14 stands that were assessed for old-growth characteristics were confirmed as old-growth and are now protected under the provincial Old Forest Policy. The COSEWIC Assessment and Status Report for Evening Grosbeak (2016) has identified the loss, alteration and fragmentation of breeding habitat due to commercial logging as a low threat overall. |

2023 MONITORING UPDATE

Currently, there is no recovery strategy, action plan and/or special management practices issued by either COSEWIC or NSDNRR.

- PHP is an active funding partner on a research project with Dalhousie University and the Nova Scotia Community College titled "At-Risk Birds Critical Habitat Modeling for Strategic Planning on Port Hawkesbury Paper's Crown License Lands". The purpose of the project is to develop and validate species at risk habitat models for various bird species known or predicted to occur in the forest management area. Previous habitat models have been constructed using the current forest inventory data, which is limited in spatial scale and detail, and aggregated at the stand level. The province has acquired topographic LiDAR data and is available for public use. In this project, we will attempt to extract relevant metrics (based on expert opinion and literature) of the forest structure from the LiDAR point cloud data in addition to other variables (topography, climate etc.) to develop a new habitat model that will be validated by field visits. The habitat models, once validated for accuracy, will be incorporated into PHP's long-term planning model and planning process to ensure adequate habitat characteristics are maintained across the landscape over time.

Habitat models are being developed for the below at-risk birds:

    Canada Warbler
    Rusty Blackbird
    Eastern Wood Pewee
    Olive-sided Flycatcher
    Evening Grosbeak
    Common Nighthawk

On PHP's Crown license area, there are 98 locations in ACCDC's sensitive species dataset from May 2022. These locations range in observation dates from 1986 to 2021 (see below map). Deferral of management activities during the breeding season of May to September may occur depending on data quality, year of original sighting, and input from regional NSDNRR biologists.

SUPPORTING DOCUMENTS/REFERENCES
COSEWIC Website; ACCDC Data

HCV – BLACK-FOAM LICHEN Habitat

HCV ATTRIBUTE	Species at Risk – Habitat	
OPERATIONAL MONITORING PROGRAM		
MANAGEMENT OBJECTIVE	Black-foam Lichen Habitat	
INDICATOR	Reserve stand structure in Black-foam lichen habitat	
MONITORING/REPORTING FREQUENCY Annual	MONITORING STRATEGY Confirm with NS Department of Natural Resources & Renewables, NS Environment, Atlantic Canada Conservation Data Centre, and Mersey Tobeatic Research Institute if any new locations of black-foam lichen have been discovered on PHP's Crown lease.	
DATA SOURCES ACCDC	COST AND DIFFICULTY Low – PHP does not yet implement SMP's	
FOREST MANAGEMENT PRESCRIPTION		

In May 2018, the NSDNRR released new Special Management Practices for At-Risk Lichens for several lichen species including: boreal felt lichen, vole ears, Hibernia jellyskin lichen, powdered moon lichen, eastern waterfan, wrinkled shingle lichen, frosted glass-whiskers, black-foam lichen, blue felt lichen, and poor-man's shingles lichen. The SMP is triggered by areas of overlap between planned forest management activities and the modelled lichen habitat for boreal felt lichen. Where there is overlap, a lichen survey is conducted and if any of the listed species in the SMP is found, a protection zone is established around the site. The sizes of these protection zones vary depending on the species. There are also restrictions related to road construction and maintenance.

For black-foam lichen, a 100 metre radius protection zone is established around each site. This zone does not permit harvesting or silviculture, mineral exploration drill sites, or new road or trail construction (unless in exceptional circumstances and under approval by DNRR). Existing road maintenance is permitted subject to review and conditions.

2023 MONITORING UPDATE
No new locations of black-foam lichen have been found on PHP's Crown lease. Currently, there is still only one known location of this lichen in the seven eastern counties where PHP operates and it is in the Cape Breton Highlands National Park. An expert lichenologist also verified that this lichen is still most commonly found in southwest Nova Scotia.
SUPPORTING DOCUMENTS/REFERENCES
NS Department of Natural Resources & Renewables, NS Environment, ACCDC, MTRI

HCV – LITTLE BROWN MYOTIS Habitat

HCV ATTRIBUTE	Species at Risk – Habitat	
OPERATIONAL MONITORING PROGRAM		
MANAGEMENT OBJECTIVE	Little Brown Myotis Habitat	
INDICATOR	Reserve stand structure in Little brown myotis habitat	
MONITORING/REPORTING FREQUENCY Annual	MONITORING STRATEGY Monitor Environment Canada's work on the development of beneficial management practices for the forest industry. Monitor Crown contractor audits to verify that unmerchantable trees, such as snags, wolf trees, and cavity trees, are being retained on site. Monitor ACCDC data for any known locations.	
DATA SOURCES ACCDC	COST AND DIFFICULTY Low – PHP does not yet implement SMP's	

FOREST MANAGEMENT PRESCRIPTION

Currently in Nova Scotia, there are no best forest management practices required for bats. 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 is currently managing the forest in a variety of ways that benefit bat habitat needs, based on a 2006 report called "Forest Management & Bats" by Bat Conservation International which lists a variety of forest management activities that can support bat habitat needs. The most beneficial stand-level best management practices include leaving the best roost sites with woodpecker holes, rot holes, cracks and splits. Retention of snags and large mature trees may also increase the suitability of forested habitat for most bat species. Additionally, NSDNRR is aware of locations in Nova Scotia where overwintering habitat such as caves, abandoned mines, and wells are used by many bat species. Restrictions to forest management activities near these locations are provided by NSDNRR during the approval process for operational plans.

2023 MONITORING UPDATE

Currently, there are no beneficial management practices developed for the forest industry. A large colony of approximately 300 females was recently found (July 2016) in Nova Scotia. Due to the highly sensitive nature of bat populations, its location was not made publicly available. However, it was confirmed to PHP by a DNRR management executive that the colony was not found on PHP's Crown lease. The 2023 Crown operations audits show that unmerchantable trees were left on harvest sites, which could serve as roost sites. ACCDC does have two locations for this species in the May 2022 dataset and both are in the Plaster Bat Cave which is located in a protected nature reserve.

SUPPORTING DOCUMENTS/REFERENCES

NS Department of Natural Resources & Renewables, Environment Canada

HCV – TRI-COLORED BAT Habitat

HCV ATTRIBUTE	**Species at Risk – Habitat**
OPERATIONAL MONITORING PROGRAM	

MANAGEMENT OBJECTIVE	Tri-colored Bat Habitat
INDICATOR	Reserve stand structure in Tri-colored bat habitat

MONITORING/REPORTING FREQUENCY Annual	MONITORING STRATEGY Monitor Environment Canada's work on the development of beneficial management practices for the forest industry. Monitor Crown contractor audits to verify that unmerchantable trees, such as snags, wolf trees, and cavity trees, are being retained on site. Monitor ACCDC data for any known locations.
DATA SOURCES ACCDC	COST AND DIFFICULTY Low – PHP does not yet implement SMP's

FOREST MANAGEMENT PRESCRIPTION

Currently in Nova Scotia, there are no best forest management practices required for bats. 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 is currently managing the forest in a variety of ways that benefit bat habitat needs, based on a 2006 report called "Forest Management & Bats" by Bat Conservation International which lists a variety of forest management activities that can support bat habitat needs. The most beneficial stand-level best management practices include leaving the best roost sites with woodpecker holes, rot holes, cracks and splits. Retention of snags and large mature trees may also increase the suitability of forested habitat for most bat species. Additionally, NSDNRR is aware of locations in Nova Scotia where overwintering habitat such as caves, abandoned mines, and wells are used by many bat species. Restrictions to forest

management activities near these locations are provided by NSDNRR during the approval process for operational plans.	
2023 MONITORING UPDATE	
Currently, there are no beneficial management practices developed for the forest industry. The 2023 Crown operations audits show that unmerchantable trees were left on harvest sites. There are no locations of this bat species in the ACCDC dataset available to PHP.	
SUPPORTING DOCUMENTS/REFERENCES	
NS Department of Natural Resources & Renewables, Environment Canada	

HCV – NORTHERN MYOTIS Habitat

HCV ATTRIBUTE	**Species at Risk – Habitat**	
OPERATIONAL MONITORING PROGRAM		
MANAGEMENT OBJECTIVE	Northern Myotis Habitat	
INDICATOR	Reserve stand structure in Northern myotis habitat	
MONITORING/REPORTING FREQUENCY Annual	MONITORING STRATEGY Monitor Environment Canada's work on the development of beneficial management practices for the forest industry. Monitor Crown contractor audits to verify that unmerchantable trees, such as snags, wolf trees, and cavity trees, are being retained on site. Monitor ACCDC data for any known locations.	
DATA SOURCES ACCDC	COST AND DIFFICULTY Low – PHP does not yet implement SMP's	

FOREST MANAGEMENT PRESCRIPTION

Currently in Nova Scotia, there are no best forest management practices required for bats. 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 is currently managing the forest in a variety of ways that benefit bat habitat needs, based on a 2006 report called "Forest Management & Bats" by Bat Conservation International which lists a variety of forest management activities that can support bat habitat needs. The most beneficial stand-level best management practices include leaving the best roost sites with woodpecker holes, rot holes, cracks and splits. Retention of snags and large mature trees may also increase the suitability of forested habitat for most bat species. Additionally, NSDNRR is aware of locations in Nova Scotia where overwintering habitat such as caves, abandoned mines, and wells are used by many bat species. Restrictions to forest management activities near these locations are provided by NSDNRR during the approval process for operational plans.

2023 MONITORING UPDATE

Currently, there are no beneficial management practices developed for the forest industry. The 2023 Crown operations audits show that unmerchantable trees were left on harvest sites. There are no locations of this bat species in the ACCDC dataset available to PHP.

SUPPORTING DOCUMENTS/REFERENCES

NS Department of Natural Resources & Renewables, Environment Canada

HCV – New Jersey Rush Habitat

HCV ATTRIBUTE	Species at Risk – Habitat	
OPERATIONAL MONITORING PROGRAM		
MANAGEMENT OBJECTIVE	Maintain New Jersey Rush Habitat	
INDICATOR	Administratively protect New Jersey Rush habitat identified in NSDNRR's Significant Habitat database and the Atlantic Coastal Plain Flora database	
MONITORING/REPORTING FREQUENCY Annual	MONITORING STRATEGY Monitor annual harvest operations to ensure New Jersey Rush habitat is administratively protected from all forest management activities.	
DATA SOURCES The Forest Manager (TFM)	COST AND DIFFICULTY Low – PHP does not conduct forest management activities within New Jersey Rush habitat	
FOREST MANAGEMENT PRESCRIPTION		
- PHP does not conduct forest management activities within New Jersey Rush habitat identified in NSDNRR's Significant Habitat database and/or the Atlantic Coastal Plain Flora database		
2023 MONITORING UPDATE		
Known locations of New Jersey Rush are protected through the Atlantic Coastal Plain Flora dataset which is provided by NSDNRR.		
SUPPORTING DOCUMENTS/REFERENCES		
Recovery Strategy and Management Plan for Multiple Species of Atlantic Coastal Plain Flora 2010; ACCDC Dataset		

Protected Areas for Atlantic Coastal Plain Flora

Legend
- Atlantic Coastal Plain Flora
- Licensed Crown
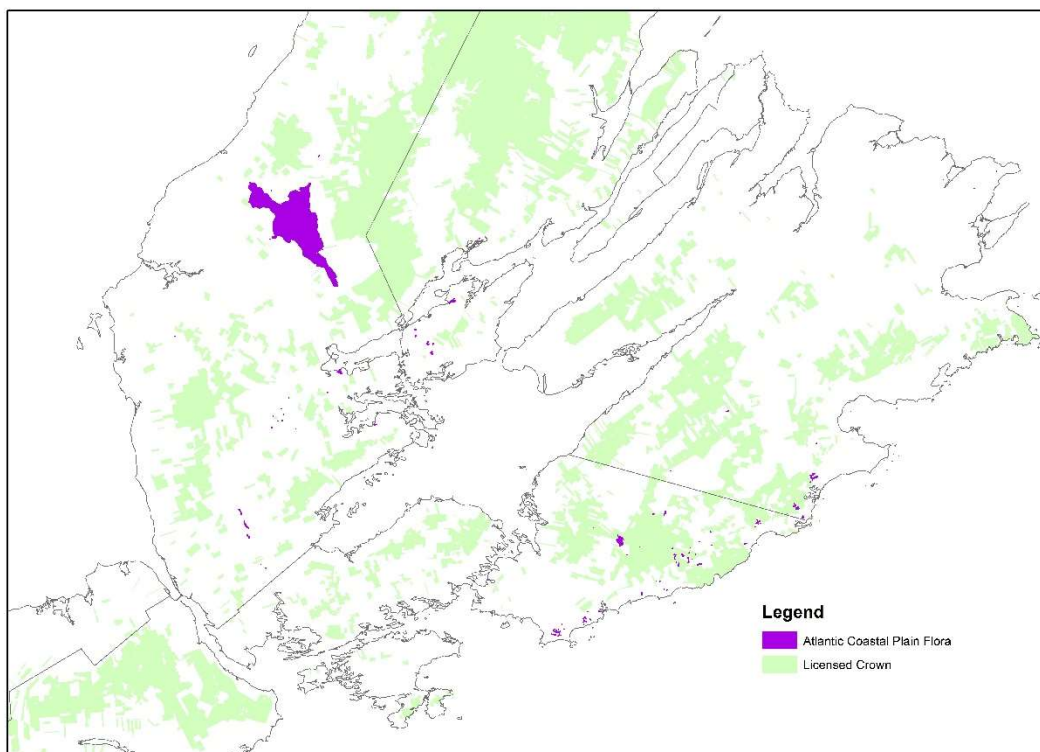
HCV – Boreal Felt Lichen Occurrences

HCV ATTRIBUTE	Species at Risk – Habitat and Population	
OPERATIONAL MONITORING PROGRAM		
MANAGEMENT OBJECTIVE	Protect identified locations of Boreal Felt Lichen	
INDICATOR	Administratively protect identified locations of Boreal Felt Lichen by establishing 100-meter buffer around site	
MONITORING/REPORTING FREQUENCY	MONITORING STRATEGY	

Annual	Monitor annual harvest operations to identify areas needing Boreal Felt Lichen presence/absence surveys prior to active operations. Locations of Boreal Felt Lichen are buffered by 100 meters and excluded from forest management activities.
DATA SOURCES The Forest Manager (TFM); Boreal Felt Lichen Potential Habitat Layer	COST AND DIFFICULTY Moderate – PHP financially contributes annually to Boreal Felt Lichen surveys. Surveys are conducted by an expert lichenologist.

LONG-TERM STRATEGIC MONITORING PROGRAM		
MANAGEMENT OBJECTIVE	Boreal Felt Lichen population recovery	
INDICATOR	Population estimates	
MONITORING STRATEGY DNRR is responsible for population inventory and studying habitat use.		
DATA SOURCES NSDNRR; NSDOE	COST AND DIFFICULTY Low to High - Dependent on PHP's required level of involvement	
FOREST MANAGEMENT PRESCRIPTION		

In May 2018, the NSDNRR released new Special Management Practices for At-Risk Lichens for several lichen species including: boreal felt lichen, vole ears, Hibernia jellyskin lichen, powdered moon lichen, eastern waterfan, wrinkled shingle lichen, frosted glass-whiskers, black-foam lichen, blue felt lichen, and poor-man's shingles lichen. The SMP is triggered by areas of overlap between planned forest management activities and the modelled lichen habitat for boreal felt lichen. Where there is overlap, a lichen survey is conducted and if any of the listed species in the SMP is found, a protection zone is established around the site. The sizes of these protection zones vary depending on the species. There are also restrictions related to road construction and maintenance.

For boreal felt lichen, a 500 metre radius special management zone is established around each site. Within this zone is a protected zone (200 m out from occurrence) and a restricted zone (300 m from edge of protected zone). In the protected zone, harvesting or silviculture, mineral exploration drill sites, or new road or trail construction (unless in exceptional

circumstances and under approval by DNRR) are permitted. Existing road maintenance is permitted subject to review and conditions.

In the restricted zone, partial harvesting is favoured by using the 'restoration' pathway in DNRR's Forest Management Guides (FMG). If the FMG determines that a clearcut is the appropriate treatment, areas of clearcut shall not exceed 10 ha and the distance between clearcuts must not be less than 100 metres. Buffers are also established around forested wetlands and provisions are made based on the state of regenerating development within the zone.

2023 MONITORING UPDATE

- In 2023, 54 surveys were completed in predicted Boreal Felt Lichen habitat. There was one planned harvest site surveyed where Boreal Felt Lichen potential habitat was identified and a 200 meter no harvest zone was established with an additional 300 meter special management zone.

- Since 2008, PHP has worked with the Mersey Tobeatic Research Institute to conduct Boreal Felt Lichen surveys. Prior to these surveys, there were three known locations of Boreal Felt Lichen in Nova Scotia. Since MTRI's surveys began for PHP, the number of known locations has increased to 526 in PHP's forest management area.

- NSDNRR recently published a paper entitled "Forest Harvesting Impacts on Mortality of an Endangered Lichen at the Landscape and Stand Scales". This paper supports protection buffers around known Boreal Felt Lichen sites to maintain the micro-climate around the site. NSDNRR is also currently working on a habitat supply research paper. NSDNRR will also be working on improving the predicted habitat model for Boreal Felt Lichen. NSDNRR will also be monitoring how different buffer widths affect microclimate using iButtons (micro-climate data loggers). Currently, there are about 24 iButtons in the field which are being used to assess the variation between and within stands. This information will help determine the sample size needed for a future buffer width study.

- PHP is a supporting partner on a recently approved Dalhousie University PhD research project by Mitacs. The project titled "Disturbance thresholds and factors influencing community dynamics of epiphytic cyanolichens in Nova Scotia, with an emphasis on rare and at-risk species". The project began in January 2018 and is expected to last two years. The researcher is expected to spend at least 35% of his time on PHP Crown licensed lands each year for site selection and planning, field work, and advisory meetings. Preliminary results indicate a higher proportion of gastropod grazing on lichens near clearcut edges than in the forest interior. There also appears to be a greater mix of non-native slug species on sites that are closer to forest roads, indicating anthropogenic vectors of spread.

SUPPORTING DOCUMENTS/REFERENCES

Boreal Felt Lichen Recovery Strategy; Boreal Felt Lichen Recovery Team

Boreal Felt Lichen - 200 meter Protection Buffers

Legend
- Boreal Felt Lichen - 200 m Buffer
- Licensed Crown
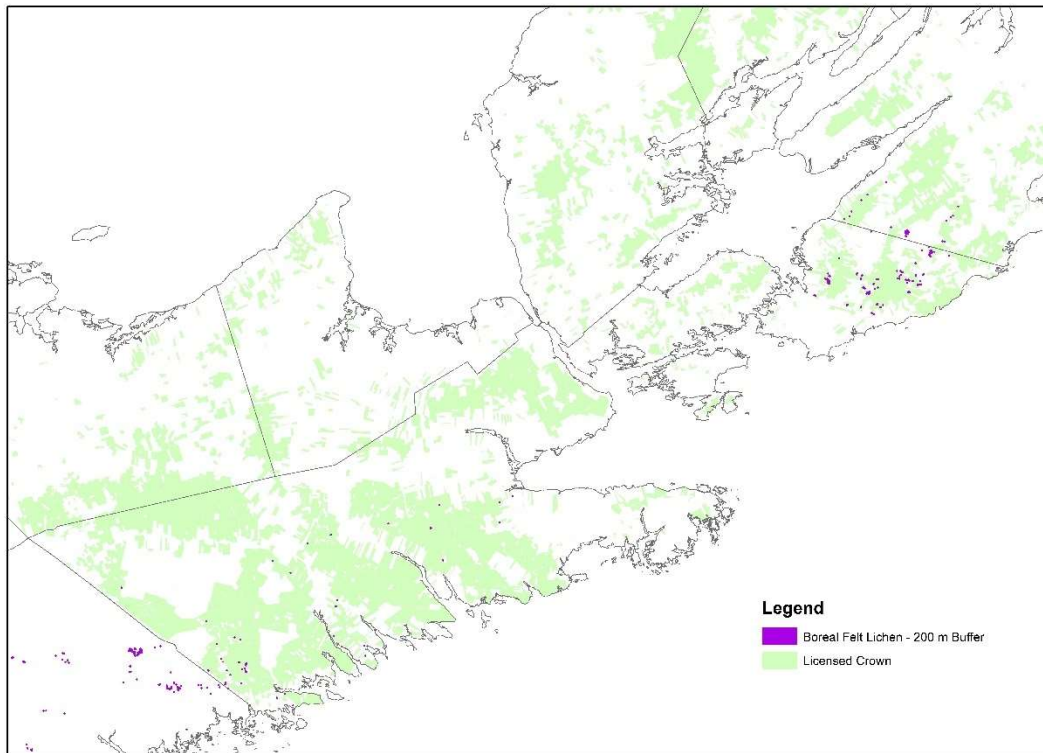
HCV – Vole Ears Lichen Occurrences

HCV ATTRIBUTE	Species at Risk – Habitat and Population
OPERATIONAL MONITORING PROGRAM	
MANAGEMENT OBJECTIVE	Protect identified locations of Vole Ears Lichen
INDICATOR	Administratively protect identified locations of Vole Ears Lichen according to SMP
MONITORING/REPORTING FREQUENCY	MONITORING STRATEGY Spatial data of known vole ears lichen has been provided to PHP by the NS Department of

Annual	Environment. There are no known locations of vole ears lichen in the 7 eastern counties where PHP operates.
DATA SOURCES The Forest Manager (TFM); Boreal Felt Lichen Potential Habitat Layer	COST AND DIFFICULTY Low – There are no known locations of Vole Ears Lichen in PHP's management area

FOREST MANAGEMENT PRESCRIPTION

In May 2018, the NSDNRR released new Special Management Practices for At-Risk Lichens for several lichen species including: boreal felt lichen, vole ears, Hibernia jellyskin lichen, powdered moon lichen, eastern waterfan, wrinkled shingle lichen, frosted glass-whiskers, black-foam lichen, blue felt lichen, and poor-man's shingles lichen. The SMP is triggered by areas of overlap between planned forest management activities and the modelled lichen habitat for boreal felt lichen. Where there is overlap, a lichen survey is conducted and if any of the listed species in the SMP is found, a protection zone is established around the site. The sizes of these protection zones vary depending on the species. There are also restrictions related to road construction and maintenance.

For vole ears lichen, a 200 metre radius protection zone is established around each site. In the protected zone, harvesting or silviculture, mineral exploration drill sites, or new road or trail construction (unless in exceptional circumstances and under approval by DNRR) are permitted. Existing road maintenance is permitted subject to review and conditions.

2023 MONITORING UPDATE

There are two known locations (year 2010 and 2015) of vole ears lichen in PHP's forest management area that are buffered with a 200 metre protection zone. Surveys completed in 2023 resulted in no new locations of vole ears lichen.

SUPPORTING DOCUMENTS/REFERENCES

COSEWIC Assessment and Status Report, 2009; NSDNRR; ACCDC 2019 Database

HCV – Blue Felt Lichen Occurrences

HCV ATTRIBUTE	Species at Risk – Habitat and Population	
OPERATIONAL MONITORING PROGRAM		
MANAGEMENT OBJECTIVE	Protect identified locations of Blue Felt Lichen	
INDICATOR	Administratively protect identified locations of Blue felt lichen according to SMP	
MONITORING/REPORTING FREQUENCY Annual	MONITORING STRATEGY Spatial data is collected annually by ACCDC for all rare species. Also, new locations are being found on PHP's Crown license during boreal felt lichen surveys.	
DATA SOURCES The Forest Manager (TFM); Boreal Felt Lichen Potential Habitat Layer	COST AND DIFFICULTY Low – A survey was conducted for the two known locations of blue felt lichen in PHP's management area.	
FOREST MANAGEMENT PRESCRIPTION		

In May 2018, the NSDNRR released new Special Management Practices for At-Risk Lichens for several lichen species including: boreal felt lichen, vole ears, Hibernia jellyskin lichen, powdered moon lichen, eastern waterfan, wrinkled shingle lichen, frosted glass-whiskers, black-foam lichen, blue felt lichen, and poor-man's shingles lichen. The SMP is triggered by areas of overlap between planned forest management activities and the modelled lichen habitat for boreal felt lichen. Where there is overlap, a lichen survey is conducted and if any of the listed species in the SMP is found, a protection zone is established around the site. The sizes of these protection zones vary depending on the species. There are also restrictions related to road construction and maintenance.

For blue felt lichen, a 100-metre radius protection zone is established around each site. In the protected zone, harvesting or silviculture, mineral exploration drill sites, or new road or

trail construction (unless in exceptional circumstances and under approval by DNRR) are permitted. Existing road maintenance is permitted subject to review and conditions.
2023 MONITORING UPDATE
Of 54 sites surveyed, there are two new locations of blue felt lichen found in PHP's forest management area during lichen surveys conducted in 2023. A 100-meter no harvest buffer was applied to each location. In total, there are 429 locations of blue felt lichen on PHP's Crown license area. A proposed management plan for Blue Felt Lichen was released for public comment in late 2020 by Environment and Climate Change Canada. This plan references the management approach currently being implemented in Nova Scotia through the provincial At-Risk Lichens SMP.
SUPPORTING DOCUMENTS/REFERENCES
COSEWIC Assessment and Status Report, 2009; NSDNRR; ACCDC 2019 Database

HCV – Eastern White Cedar

HCV ATTRIBUTE	**Species at Risk – Habitat and Population**	
OPERATIONAL MONITORING PROGRAM		
MANAGEMENT OBJECTIVE	Protect identified locations of Eastern White Cedar	
INDICATOR	Protection of all known locations of Eastern White Cedar	
MONITORING/REPORTING FREQUENCY Annual	MONITORING STRATEGY Ensure all known locations of Eastern White Cedar in PHP's management area are protected from harvest activities.	

DATA SOURCES	COST AND DIFFICULTY
The Forest Manager (TFM); NSDNRR, NSE, ACCDC databases	Low – PHP does not conduct include the harvest of Eastern White Cedar in its management

FOREST MANAGEMENT PRESCRIPTION
- PHP does not include the harvest of Eastern White Cedar in its forest management. 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.

2023 MONITORING UPDATE
No known stands or individual trees of eastern white cedar have been found or are known to occur within PHP's area of operation.

SUPPORTING DOCUMENTS/REFERENCES
A Management Plan for Native Occurrences of Eastern White Cedar in Nova Scotia, 2010

HCV – Black Ash
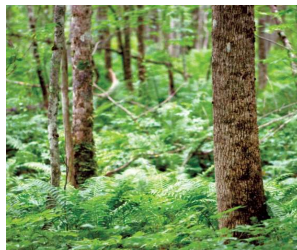
HCV ATTRIBUTE	Species at Risk – Habitat and Population
OPERATIONAL MONITORING PROGRAM	
MANAGEMENT OBJECTIVE	Protect identified locations of Black Ash
INDICATOR	Protection of all known locations of Black Ash
MONITORING/REPORTING FREQUENCY	MONITORING STRATEGY

Annual	Ensure all known locations of Black Ash in PHP's management area are protected from harvest activities.
DATA SOURCES The Forest Manager (TFM); NSDNRR, NSE, ACCDC databases	COST AND DIFFICULTY Low – PHP does not conduct include the harvest of Black Ash in its management

FOREST MANAGEMENT PRESCRIPTION

- PHP does not include the harvest of Black Ash in its forest management. Queries of the NSDNRR forest inventory, as well as reviews of the rare species databases from NSDNRR, NSE, and ACDCC, did not identify black ash stands for lands managed by PHP.

2023 MONITORING UPDATE

No new stands of black ash were identified in 2023.

In the spring of 2021, a stand of black ash was discovered by a PHP Woodlands Supervisor during a routine survey of a 19.8 hectare area of forest in Cape Breton. This newly uncovered stand is significant because it is a cluster of trees, and there is evidence of seed-bearing trees, which indicates male and female trees in the area. Most known black ash populations in Cape Breton are reproducing by stump sprouts, not seed. Other trees easily out-compete black ash trees, but the large diameters of some trees indicate that they are mature and not suppressed. A formal survey of the property was completed to determine if more trees are present and to create a plan to protect the current stand.

SUPPORTING DOCUMENTS/REFERENCES

NSDNRR, NSE, ACCDC databases

HCV – Frosted Glass Whiskers Habitat

HCV ATTRIBUTE	Species at Risk – Habitat	
OPERATIONAL MONITORING PROGRAM		
MANAGEMENT OBJECTIVE	Maintain Frosted Glass Whiskers Habitat	
INDICATOR	Administratively protect Frosted Glass Whiskers habitat identified in NSDNRR's Significant Habitat database and Atlantic Canada Conservation Data Centre database	
MONITORING/REPORTING FREQUENCY Annual	MONITORING STRATEGY All known locations of frosted glass whiskers are protected.	
DATA SOURCES The Forest Manager (TFM)	COST AND DIFFICULTY Low – PHP does not conduct forest management activities within Frosted Glass Whiskers habitat	
FOREST MANAGEMENT PRESCRIPTION		

In May 2018, the NSDNRR released new Special Management Practices for At-Risk Lichens for several lichen species including: boreal felt lichen, vole ears, Hibernia jellyskin lichen, powdered moon lichen, eastern waterfan, wrinkled shingle lichen, frosted glass-whiskers, black-foam lichen, blue felt lichen, and poor-man's shingles lichen. The SMP is triggered by areas of overlap between planned forest management activities and the modelled lichen habitat for boreal felt lichen. Where there is overlap, a lichen survey is conducted and if any of the listed species in the SMP is found, a protection zone is established around the site. The sizes of these protection zones vary depending on the species. There are also restrictions related to road construction and maintenance.

For frosted glass whiskers, a 100 metre radius protection zone is established around each site. In the protected zone, harvesting or silviculture, mineral exploration drill sites, or new road or

trail construction (unless in exceptional circumstances and under approval by DNRR) are permitted. Existing road maintenance is permitted subject to review and conditions.
2023 MONITORING UPDATE
- One new location of frosted glass whiskers was found in 2023 during regular lichen surveys. This location was buffered with a 100-meter no harvest buffer. - There are 12 known locations of frosted glass whiskers in eastern Nova Scotia. Five of these locations occur on privately owned land. The other seven locations are on PHP's Crown license area and are buffered with a protection zone.
SUPPORTING DOCUMENTS/REFERENCES
Management Plan for the Frosted Glass Whiskers, Nova Scotia Population, 2011; ACCDC 2019 Database; Boreal Felt Lichen Surveys, 2017-18

HCV – Wrinkled Shingle Lichen Habitat

HCV ATTRIBUTE	**Species at Risk – Habitat**	
OPERATIONAL MONITORING PROGRAM		
MANAGEMENT OBJECTIVE	Maintain Wrinkled Shingle Lichen Habitat	
INDICATOR	Administratively protect Wrinkled Shingle Lichen habitat in identified locations by NSDNRR, ACCDC, or PHP lichen survey results.	
MONITORING/REPORTING FREQUENCY Annual	MONITORING STRATEGY All known locations of wrinkled shingle lichen are protected.	
DATA SOURCES The Forest Manager (TFM)	COST AND DIFFICULTY Low – PHP does not conduct forest management activities within wrinkled shingle lichen habitat	
FOREST MANAGEMENT PRESCRIPTION		

In May 2018, the NSDNRR released new Special Management Practices for At-Risk Lichens for several lichen species including: boreal felt lichen, vole ears, Hibernia jellyskin lichen, powdered moon lichen, eastern waterfan, wrinkled shingle lichen, frosted glass-whiskers, black-foam lichen, blue felt lichen, and poor-man's shingles lichen. The SMP is triggered by areas of overlap between planned forest management activities and the modelled lichen habitat for boreal felt lichen. Where there is overlap, a lichen survey is conducted and if any of the listed species in the SMP is found, a protection zone is established around the site. The sizes of these protection zones vary depending on the species. There are also restrictions related to road construction and maintenance.

For wrinkled shingle lichen, a 100 metre radius protection zone is established around each site. In the protected zone, harvesting or silviculture, mineral exploration drill sites, or new road or trail construction (unless in exceptional circumstances and under approval by DNRR) are permitted. Existing road maintenance is permitted subject to review and conditions.

2023 MONITORING UPDATE

No new locations of wrinkled shingle lichen were found on PHP's Crown license area in 2023. There is one known location of wrinkled shingle lichen in eastern Nova Scotia, which was discovered in 2014. This location has a 100-meter no harvest buffer applied to it.

SUPPORTING DOCUMENTS/REFERENCES

COSEWIC Assessment and Status Report, 2017; ACCDC 2019 Database; Boreal Felt Lichen Surveys, 2017-18

HCV – Cold Water Refugia Sub-watersheds

HCV ATTRIBUTE	**Long-term hydrologic functions**
OPERATIONAL MONITORING PROGRAM	
MANAGEMENT OBJECTIVE	Maintenance of thermal cover for Atlantic Salmon and Brook Trout habitat
INDICATOR	Maintain minimum 50% crown closure at the stand level in cold water refugia areas (total 30,015 hectares) with the exception of stands containing non-wind firm trees.

| MONITORING/REPORTING FREQUENCY

Annual | MONITORING STRATEGY

Monitor implementation of stand structure reserve using GIS overlay of completed harvest treatments with cold water refugia sub-watershed areas. |
|---|---|
| DATA SOURCES

The Forest Manager (TFM) | COST AND DIFFICULTY

Low – PHP monitors this internally with resources currently available. |

FOREST MANAGEMENT PRESCRIPTION

- Cold water refugia areas are managed to maintain as much thermal cover as possible by leaving a minimum 50% crown closure wherever possible at the stand level following harvest treatments.

- The only exception is in stands containing a high proportion of non-wind firm trees, such as balsam fir, black spruce, or white spruce that are vulnerable to blowdown.

- No intensive forest management will occur in these HCVF's (i.e. establishing FSC defined plantations).

2023 MONITORING UPDATE
In 2023, 61 hectares was treated in cold water refugia areas. Treatments consisted of commercial thinning as well as variable retention treatments with 10%, 20% and 30% retention left on site.
SUPPORTING DOCUMENTS/REFERENCES
N/A

HCV – International Bird Areas

HCV ATTRIBUTE	**Migratory birds habitat**	
OPERATIONAL MONITORING PROGRAM		
MANAGEMENT OBJECTIVE	Maintain and/or enhance migratory bird habitat	
INDICATOR	Reserve stand structure in Important Bird Areas (IBA's)	
MONITORING/REPORTING FREQUENCY Annual	MONITORING STRATEGY Currently, all identified IBA's in PHP's operating area are not impacted by forest management activities due to their location (i.e. off shore islands or inaccessible forest areas). Specific protocols for monitoring birds at IBAs are in development and will leverage and adapt existing monitoring programs that are directly relevant to the IBA Program (IBA Canada website). Verify annually that spatial list of IBA's is up-to-date for PHP's operating area.	
DATA SOURCES	COST AND DIFFICULTY	

The Forest Manager (TFM); IBA Canada	Low – PHP does not conduct forest management activities in IBA's, therefore, monitoring is not considered necessary.

FOREST MANAGEMENT PRESCRIPTION

- 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 HCVF, no harvesting currently occurs and is not expected to occur in the future. Should harvest plans be developed, a management strategy for this HCVF will be developed.

2023 MONITORING UPDATE

PHP has not conducted any forest management activities in IBA's identified within the forest management area.

SUPPORTING DOCUMENTS/REFERENCES

IBA Canada website http://www.ibacanada.ca/

HCV – Red Spruce

HIGH CONSERVATION VALUE – RED SPRUCE	
HCV ATTRIBUTE	Natural Red Spruce Stands
OPERATIONAL MONITORING PROGRAM	
MANAGEMENT OBJECTIVE	Manage red spruce stands according to PHP Work Instruction for red spruce
INDICATOR	Management and maintenance of red spruce stands to improve the quality of uneven-aged conditions over time.
MONITORING/REPORTING FREQUENCY Annual	MONITORING STRATEGY Verify that annual harvest completions in natural red spruce stands were implemented using PHP's work instruction for red spruce management.
DATA SOURCES The Forest Manager (TFM)	COST AND DIFFICULTY Low – PHP has forest cover and historical data that shows natural red spruce stand locations. The PHP planner identifies these areas for management.
FOREST MANAGEMENT PRESCRIPTION	

Objectives for 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 some 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

Commercial thinning when windfirm.

An option for non-windfirm 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

Shelterwood to promote regeneration.

As an 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 in to 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. ie an irregular shelterwood
>
> - Step Two once regeneration is 60 cm tall (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 into 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 (over story removal and planting), or it should be left to grow until maturity then harvested.

2023 MONITORING UPDATE
Approximately 0.8 of a hectare of red spruce was treated in 2023.

HCV – Protected Areas

HCV ATTRIBUTE	**Protected Area**	
OPERATIONAL MONITORING PROGRAM		
MANAGEMENT OBJECTIVE	Establish protected areas (legal, pending, and/or administrative) in PHP's management area	
INDICATOR	Establishment of legal, pending, and/or administrative protected areas	
MONITORING/REPORTING FREQUENCY Annual	MONITORING STRATEGY Continue to monitor provincial government's protected lands process for the establishment and legal protection of new wilderness areas and/or other decisions made regarding areas.	
DATA SOURCES The Forest Manager (TFM); NSDNRR; NSDOE	COST AND DIFFICULTY Low	
FOREST MANAGEMENT PRESCRIPTION		
- All identified forest lands for legal or pending protection by the provincial government have been delineated in TFM and are clearly marked as legal or pending protected areas. - All identified forest lands for administrative protection by PHP have been delineated in TFM and are clearly marked as administrative protected areas. - PHP staff is aware that no forest management activities are allowed to occur in these areas.		

Protected Area Category	# of Sites	Total Hectares
New Provincial Protected Area	89	98,184
Provincial Parks and Reserves	21	1,492
Provincial Nature Reserves	7	1,868
Provincial Wilderness Areas	19	106,526
National Migratory Bird Sanctuaries	1	392
National Parks	1	94,870
TOTAL HECTARES		**303,332**

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

2023 MONITORING UPDATE
A GIS overlay using completed harvest treatment data from 2023 shows that there have been no forest management activities conducted in legal or administrative protected areas.

SUPPORTING DOCUMENTS/REFERENCES
Our Parks and Protected Areas: A Plan for Nova Scotia, 2013; TFM Data; NSE Protected Areas

HCV – Special Management Zone Adjacent to Protected Area Boundaries

HCV ATTRIBUTE	**Limit Protected Area Access**	
	OPERATIONAL MONITORING PROGRAM	
MANAGEMENT OBJECTIVE	Minimize road construction	
INDICATOR	Minimize road construction to reduce access points into protected areas by implementing a 200-meter wide special management zone.	
MONITORING/REPORTING FREQUENCY Annual	MONITORING STRATEGY Assess whether new roads have been built in the special management zone using GIS overlay.	
DATA SOURCES The Forest Manager (TFM)	COST AND DIFFICULTY	

	Low – PHP currently monitors the special management zone and road construction using TFM.
FOREST MANAGEMENT PRESCRIPTION	
- Minimize road construction to reduce access points into the protected area. If roads are needed, they are to build parallel to the protected area boundary to minimize access points.	
2023 MONITORING UPDATE	
No new roads were built in the special management zone adjacent to protected area boundaries in 2023. Also in 2021, NSDNRR implemented a 100-m buffer around all existing protected areas. These buffers are for implementing special management practices and/or additional protection measures for protected areas.	
SUPPORTING DOCUMENTS/REFERENCES	
N/A	

HCVF Category 2 – Large Landscape Level Forests

HCV – Intact Forest Landscapes

HCV ATTRIBUTE	Intact Forest Landscapes

OPERATIONAL MONITORING PROGRAM	
MANAGEMENT OBJECTIVE	Adhere to FSC requirements for management of Intact Forest Landscapes
INDICATOR	Maintain the integrity and intactness of intact forest landscapes.

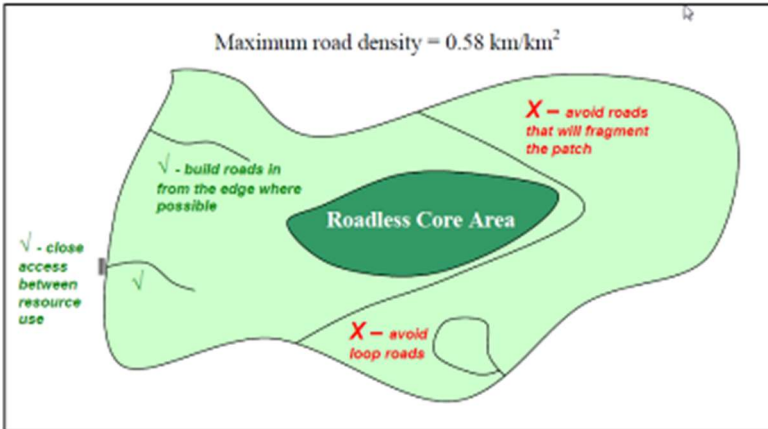| MONITORING/REPORTING FREQUENCY Annual	MONITORING STRATEGY Assess whether more than 20% of the IFL has been impacted, and if the IFL has been reduced in size below 50,000 ha.
DATA SOURCES The Forest Manager (TFM)	COST AND DIFFICULTY Low – PHP currently monitors the IFL using TFM.

FOREST MANAGEMENT PRESCRIPTION

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.

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

2023 MONITORING UPDATE

Year	Total Harvest (hectares)	Total Silviculture (hectares)	Total Roads Built (km)
2017	O	O	O
2018	O	O	O

2019	O	O	O
2020	23.7	O	O
2021	0	0	0
2022	0	0	0
2023	0	0	0

SUPPORTING DOCUMENTS/REFERENCES
Global Forest Watch; FSC Advice Note on Intact Forest Landscapes

Intact Forest Landscape

Legend
- GFWC_Canada_IFL_2013_Final
- 2020 Harvest Area
- Existing and Pending Protected Areas
- PHP FULA Crown License

Cape Breton Highlands National Park

2020 Harvest Area – 23.7 ha

0 2.5 5 10 15 20 Kilometers
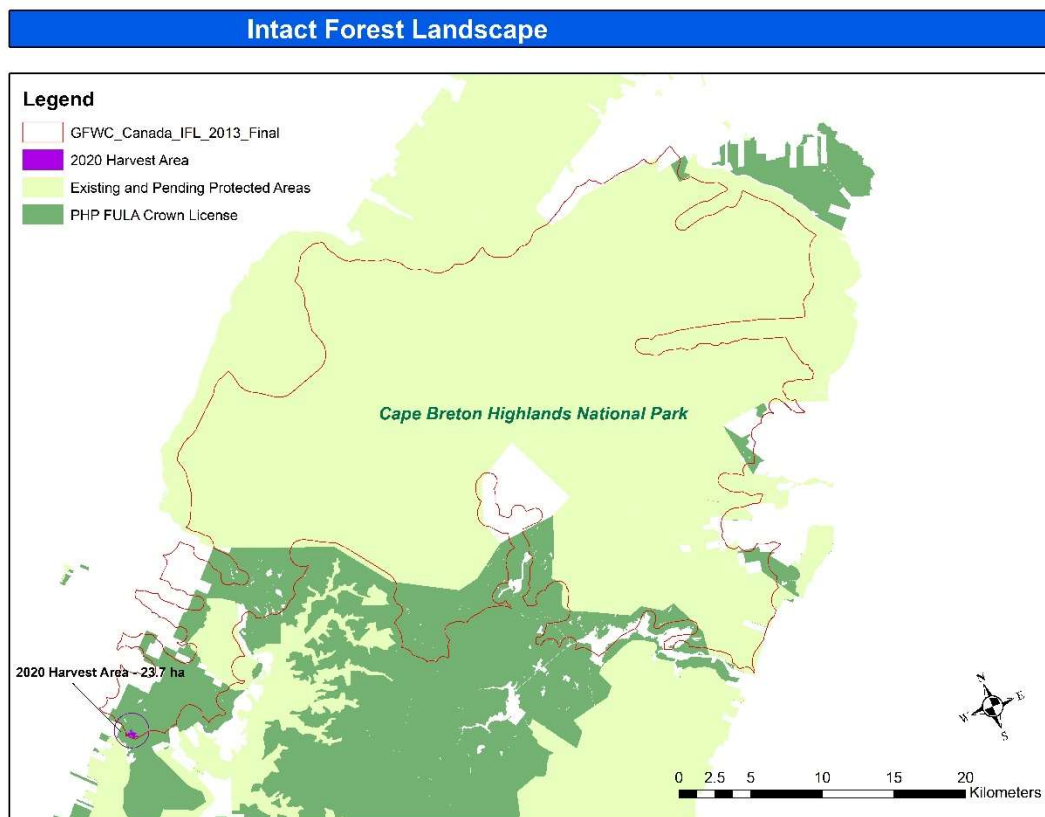
HCV – Large Landscape Level Forests

HCV ATTRIBUTE	Biodiversity and Intactness	
OPERATIONAL MONITORING PROGRAM		
MANAGEMENT OBJECTIVE	To maintain biodiversity values and intactness in large landscape level forests	
INDICATOR	Manage large landscape level forests with special practices in protected areas, core roadless areas, and special management areas	
MONITORING/REPORTING FREQUENCY Annual	MONITORING STRATEGY Assess management activities within large landscape level forests to ensure practices comply with requirements outlined for protected areas, core roadless areas, and special management areas.	
DATA SOURCES The Forest Manager (TFM)	COST AND DIFFICULTY Low – PHP currently monitors large landscape level forests using TFM.	
FOREST MANAGEMENT PRESCRIPTION		

- 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, DNRR requests during approval process)

2023 MONITORING UPDATE

PHP uses the provincial Forest Ecosystem Classification manual for all forest management decisions. PHP does not conduct full-tree logging, plant exotic species, use herbicides, and has not implemented intensive management in these areas. All other management prescriptions mentioned above are implemented across the entire forest management area.

The below table summarizes the current status of each large landscape level forest with respect to road index and minimum non-clearcut condition. Non-clearcut condition is defined as anything greater than 10 years of age. No new roads were built in large landscape level forests in 2023, so the road index remains the same as in 2016.

| HCVF LLLF Name | Total HA | Road Index Maximum Allowed = 0.58 km/km2 | | Minimum Non-clearcut Condition = 60% |
		2023 Road Index	Future Road Index	Non-clearcut Condition in 2023
Barren Hill	1,318	0.08 km/km2	0.20 km/km2	99%
Boisdale Hills	5,630	0.40 km/km2	0.52 km/km2	100%
Bornish Hill (fully protected)	2,106	0 km/km2	0 km/km2	100%
Country Harbour	8,202	0.03 km/km2	0.03 km/km2	100%
East Bay Hills	1,865	0.23 km/km2	0.31 km/km2	98%
French River	25,226	0 km/km2	0 km/km2	100%
Hill Lake	877	0.55 km/km2	0.65 km/km2	100%
Ingonish River	15,210	0.01 km/km2	0.01 km/km2	100%
Isaacs Harbour River	6,157	0.25 km/km2	0.42 km/km2	98%
Jim Campbells Barren (fully protected)	4,586	0.21 km/km2	0.21 km/km2	100%
Masons Mountain (fully protected)	1,022	0.06 km/km2	0.06 km/km2	100%
North River	6,328	0.20 km/km2	0.20 km/km2	100%
Oban	1,618	0.57 km/km2	0.78 km/km2	89%

Petit Lake Ruiss Noir (fully protected)	1,612	0 km/km2	0 km/km2	100%
Salmon Gaspereaux	2,357	0.30 km/km2	0.61 km/km2	94%
Upper Liscomb River	7,398	0.07 km/km2	0.07 km/km2	100%
TOTAL HECTARES	**91,512**		Future index may exceed maximum 0.58 km/km2. Will need to manage road index to meet target.	

HCVF LLLF Name	Total HA	2023 Total Area Treated	Treatment Used
Barren Hill	1,318	No area treated	
Boisdale Hills	5,630	No area treated	
Bornish Hill (fully protected)	2,106	No area treated	
Country Harbour	8,202	No area treated	
East Bay Hills	1,865	No area treated	
French River	25,226	No area treated	
Hill Lake	877	No area treated	
Ingonish River	15,210	No area treated	
Isaacs Harbour River	6,157	No area treated	

Jim Campbells Barren (fully protected)	4,586	No area treated	
Masons Mountain (fully protected)	1,022	No area treated	
North River	6,328	No area treated	
Oban	1,618	No area treated	
Petit Lake Ruiss Noir (fully protected)	1,612	No area treated	
Salmon Gaspereaux	2,357	No area treated	
Upper Liscomb River	7,398	No area treated	
TOTAL HECTARES	**91,512**	**No area treated**	

HCVF Category 3 – Rare, Threatened or Endangered Ecosystems

HCV – Significant Ecosites

HCV ATTRIBUTE	Rare, threatened or endangered ecosystems	
OPERATIONAL MONITORING PROGRAM		
MANAGEMENT OBJECTIVE	Maintain rare, threatened or endangered ecosystems	
INDICATOR	Rare, threatened or endangered ecosystems administratively protected from forest management activities	
MONITORING/REPORTING FREQUENCY Annual	MONITORING STRATEGY Monitor rare, threatened or endangered ecosystems to ensure they are administratively protected from forest management activities. Exception applies if the mapped ecosystem type does not match on-the-ground characteristics.	
DATA SOURCES The Forest Manager (TFM); NSDOE	COST AND DIFFICULTY Low	
FOREST MANAGEMENT PRESCRIPTION		

- All significant ecosites are administratively protected from forest management activities with the following exceptions:
    - Karst conifer forest, karst hardwood forest, calcareous forest, and hemlock forest that have been previously managed will continue to be managed to maintain and restore mature climax conditions.
    - Significant ecosites are identified using the provincial forest inventory data and there has been limited field verification, so there is a certain amount of ambiguity within the dataset. Since there may be data inaccuracies between the digital information versus on-the-ground characteristics, stands that do not match the inventory data are exempt from special management activities as outlined here.		

2023 MONITORING UPDATE		
No significant ecosites were managed in 2023.		
SUPPORTING DOCUMENTS/REFERENCES		
Significant Ecosite data layer, NSDOE		

HCV – Significant, Old or Unique Forests

HCV ATTRIBUTE	Rare, threatened or endangered ecosystems

OPERATIONAL MONITORING PROGRAM

MANAGEMENT OBJECTIVE	Maintain rare, threatened or endangered ecosystems
INDICATOR	Rare, threatened or endangered ecosystems administratively protected from forest management activities

MONITORING/REPORTING FREQUENCY Annual	MONITORING STRATEGY Monitor rare, threatened or endangered ecosystems to ensure they are administratively protected from forest management activities. Exception applies if the mapped ecosystem type does not match on-the-ground characteristics.
DATA SOURCES The Forest Manager (TFM); NSDOE	COST AND DIFFICULTY Low

FOREST MANAGEMENT PRESCRIPTION

- All significant, old or unique forests (SOUF) are administratively protected from forest management activities that meet the following species composition (SOUF code in brackets). Exception applies if the mapped ecosystem type does not match on-the-ground characteristics.

Species composition	Stand height
70% or more spruce or red spruce (SPRU)	≥17m
50% or more eastern hemlock (HEML)	≥15m
50% or more white pine (WHPI)	≥18m
70% or more climax coniferous species with the most common species no more than 60% (MCCO)	≥17m
50% or more sugar maple (SUMA)	≥17m
70% or more climax deciduous species or tolerant hdwd (MCDE)	≥17m
70% or more climax coniferous or deciduous species with neither group exceeding 60% (MCCD)	≥17m
30% or more red pine (excl. plantations) (REPI0	≥12m
50% or more Beech	≥18m

2023 MONITORING UPDATE
A GIS overlay using completed harvest treatment data from 2023 shows no SOUF stand was managed.
SUPPORTING DOCUMENTS/REFERENCES
Significant, old or unique data layer, NSDOE

HCV – Old Forest

HCV ATTRIBUTE	Old Forest Protected Area	
OPERATIONAL MONITORING PROGRAM		
MANAGEMENT OBJECTIVE	Establish old forest protected areas on land-base	
INDICATOR	Establishment and legal protection of old forest protected areas	
MONITORING/REPORTING FREQUENCY Annual	MONITORING STRATEGY Monitor old forest protected areas TFM to ensure no forest management activities are conducted.	
DATA SOURCES The Forest Manager (TFM); NSDNRR; NSDOE	COST AND DIFFICULTY Low	
FOREST MANAGEMENT PRESCRIPTION		
- All identified old forest areas are legally protected by the provincial government. - PHP staff is aware that no forest management activities are allowed to occur in these areas.		
2023 MONITORING UPDATE		
A GIS overlay using completed harvest treatment data from 2023 shows that there have been no forest management activities conducted in the old forest areas identified by the provincial government. In 2018, the NS Department of Natural Resources & Renewables initiated a new old-growth forest protocol for the assessment of mature climax hardwood stands greater than 11 meters height based on forest inventory data. Since that time, an additional 38,173 hectares of old-growth areas have been identified and protected on PHP's Crown license area.		

SUPPORTING DOCUMENTS/REFERENCES
Old forest GIS layer, NSDNRR

HCV – Poorly Represented Ecosystems

HCV ATTRIBUTE	**Protection of Poorly Represented Ecosystems**
OPERATIONAL MONITORING PROGRAM	
MANAGEMENT OBJECTIVE	Establish protection of poorly represented ecosystems on land-base
INDICATOR	Establishment and administrative protection of poorly represented ecosystems

MONITORING/REPORTING FREQUENCY Annual	MONITORING STRATEGY Monitor poorly represented ecosystems in TFM to ensure no forest management activities are conducted.
DATA SOURCES The Forest Manager (TFM)	COST AND DIFFICULTY Low

FOREST MANAGEMENT PRESCRIPTION

- All identified poorly represented ecosystems are administratively protected by PHP.
- PHP staff is aware that no forest management activities are allowed to occur in these areas.

Poorly Represented Ecosystem	Total Hectares
Masons Mountain	197
Jim Cambells Barren	2,844
Boisdale Hills	1,727
Country Harbour	829
North River	27
Oban	170
Hill Lake	113
Salmon Gaspereaux	240
TOTAL HECTARES	**6,147**

2023 MONITORING UPDATE
There have been no management activities in the above PHP administratively protected areas.
SUPPORTING DOCUMENTS/REFERENCES
PHP Gap Analysis Report

HCV – Connectivity Management Zones

HCV ATTRIBUTE	Continuous Canopy cover	
OPERATIONAL MONITORING PROGRAM		
MANAGEMENT OBJECTIVE	Maintain continuous canopy cover between protected areas and old forest areas	
INDICATOR	Maintain a 100-meter wide continuous canopy cover (minimum 30%) corridor within the 500-meter wide Connectivity Management Zone (CMZ)	
MONITORING/REPORTING FREQUENCY Annual	MONITORING STRATEGY Monitor 100 meters within the CMZ to ensure a continuous canopy cover and CMZ's are not severed across their width.	
DATA SOURCES The Forest Manager (TFM)	COST AND DIFFICULTY Low	
FOREST MANAGEMENT PRESCRIPTION		
- The Connectivity Management Zones will be managed to provide continuous canopy cover (minimum 30%) within the 500-meter wide corridors, which will include a solid 100-meter wide core zone. Although harvesting can occur within the CMZ's, these corridors will not be severed across their width. - The 500-meter wide CMZ's are static on the landscape, but the 100-meter wide core zone can 'move' within the CMZ.		
2023 MONITORING UPDATE		
The Connectivity Management Zones continue to maintain a continuous canopy cover within the 100-meter wide core zone.		

SUPPORTING DOCUMENTS/REFERENCES
The Forest Manager

HCV – Margaree & St. Mary's River Watershed

HIGH CONSERVATION VALUE – MARGAREE & ST. MARY'S RIVER WATERSHED	
HCV ATTRIBUTE	Non-clearcut Condition
OPERATIONAL MONITORING PROGRAM	
MANAGEMENT OBJECTIVE	To maintain a high level of non-clearcut condition in St. Mary's and Margaree Watersheds, and restoration management
INDICATOR	Each watershed shall have minimum 80% of its area (that is managed by PHP) in a non-clearcut condition, and 90% of each watershed shall be managed for restoration (i.e. no more than 10% of each watershed will be established as a FSC plantation).

MONITORING/REPORTING FREQUENCY	MONITORING STRATEGY
Annual	Monitor non-clearcut condition in each watershed to ensure target of minimum 80% is met.
DATA SOURCES	COST AND DIFFICULTY
The Forest Manager (TFM)	Low

FOREST MANAGEMENT PRESCRIPTION
- The St. Mary's and Margaree watersheds will be managed to maintain 80% or more of all lands managed by PHP in the watershed in a closed forest condition (> 12 years of age). - Additionally, PHP will maintain at least 90% of the St. Mary's and Margaree watersheds in a natural condition for restoration, and will establish 200 m forest restoration zones (i.e. non-intensive management) along all main watercourses.

2023 MONITORING UPDATE
PHP has been monitoring the non-clearcut condition in these watersheds for several years. See Indicator 3.2 on page 23 for current condition of St. Mary's and Margaree watersheds. Since 2008, these two watersheds have maintained minimum 80% non-clearcut condition.
SUPPORTING DOCUMENTS/REFERENCES
The Forest Manager

HCVF Category 4 – Basic Services of Nature

HCV – Legally Protected Municipal Water Supply Areas

HCV ATTRIBUTE	**Water Health**
OPERATIONAL MONITORING PROGRAM	
MANAGEMENT OBJECTIVE	Maintain water health for communities
INDICATOR	Implement water protection measures in legally protected municipal water supply areas
MONITORING/REPORTING FREQUENCY Annual	MONITORING STRATEGY Monitor implementation of water protection measures.
DATA SOURCES The Forest Manager (TFM); NSDOE	COST AND DIFFICULTY Low
FOREST MANAGEMENT PRESCRIPTION	
There is no land managed by PHP within the water supply areas unless requested or approved by the municipality through a watershed committee.	
2023 MONITORING UPDATE	
A GIS overlay using completed harvest treatment data from 2023 shows that there was no harvest inside designated municipal water supply areas.	
SUPPORTING DOCUMENTS/REFERENCES	

Nova Scotia Department of Environment

HCV – Water Supply Intake Areas

HCV ATTRIBUTE	Water Health
OPERATIONAL MONITORING PROGRAM	
MANAGEMENT OBJECTIVE	Maintain water health for communities
INDICATOR	Implement water protection measures around water supply intake areas.

MONITORING/REPORTING FREQUENCY Annual	MONITORING STRATEGY Monitor implementation of water protection measures.
DATA SOURCES The Forest Manager (TFM); NSDOE	COST AND DIFFICULTY Low

FOREST MANAGEMENT PRESCRIPTION

- Water protection measures include the Wildlife and Habitat Watercourse Protection Regulations, monitoring of % closed forest condition, steep slope management, HCVF aquatic watershed management, and rutting and ground disturbance guidelines.

2023 MONITORING UPDATE

A GIS overlay of completed harvest treatments and water supply intake areas shows no hectares were managed within the intake areas.

SUPPORTING DOCUMENTS/REFERENCES

Nova Scotia Department of Environment

HCV – Steep Slopes

HCV ATTRIBUTE	**Soil Health; Community Health**	
OPERATIONAL MONITORING PROGRAM		
MANAGEMENT OBJECTIVE	Maintain soil health and community health	
INDICATOR	No conventional harvesting in steep slope areas (30% average slope or greater)	
MONITORING/REPORTING FREQUENCY Annual	MONITORING STRATEGY Monitor steep slope areas and conventional harvesting activities.	
DATA SOURCES The Forest Manager (TFM)	COST AND DIFFICULTY Low	
FOREST MANAGEMENT PRESCRIPTION		
- Conventional harvesting is not permitted in areas with 30% average slope or greater. Non-conventional harvesting such as cable logging is permitted, however, PHP is currently not using this practice.		
2023 MONITORING UPDATE		
See page 22, indicator 3.1 for update. NOTE: This indicator is based on spatial data that identifies slopes > than 30% average using contour data. It is not based on the actual % slope for any given area as could be determined on-the-ground. Therefore, to calculate the results for the indicator, a GIS exercise is done which overlaps the steep slope data with completed harvest jobs to determine non-conformances. Most often, the areas showing as harvested are slivers due to inaccuracies in the data.		
SUPPORTING DOCUMENTS/REFERENCES		
The Forest Manager		

HCVF Category 5 – Basic Needs of Local Communities

HCV – Cattle Grazing on Cape Breton Highlands

HCV ATTRIBUTE	Local communities	
OPERATIONAL MONITORING PROGRAM		
MANAGEMENT OBJECTIVE	Support needs of local communities	
INDICATOR	Cattle grazing on the Cape Breton Highlands is allowed	
MONITORING/REPORTING FREQUENCY Annual	MONITORING STRATEGY Monitor any issues arising from cattle grazing on Cape Breton Highlands	
DATA SOURCES N/A	COST AND DIFFICULTY Low	
FOREST MANAGEMENT PRESCRIPTION		
- Local farmers have let their cattle graze on the Cape Breton Highlands for several years during the summer/fall months. - PHP does not restrict this use.		
2023 MONITORING UPDATE		
No issues have arisen in 2023 regarding cattle grazing in the Cape Breton Highlands.		
SUPPORTING DOCUMENTS/REFERENCES		
N/A		

HCV – Viewshed Areas

HCV ATTRIBUTE	**Local Communities**
OPERATIONAL MONITORING PROGRAM	
MANAGEMENT OBJECTIVE	Minimize visual impacts to local communities from harvest activities
INDICATOR	Implement work instruction 'Harvest View from Roadside'

MONITORING/REPORTING FREQUENCY Annual	MONITORING STRATEGY Monitor any issues in identified viewshed areas arising from harvest activities.
DATA SOURCES The Forest Manager (TFM); Harvest View from Roadside Work Instruction	COST AND DIFFICULTY Low

FOREST MANAGEMENT PRESCRIPTION

District staff is responsible for determining the visibility rating using the TFM layer 'Viewsheds'. A harvest area determined to be within the **low category** will not require any specific landscape planning beyond regular housekeeping measures and removal of unsightly damaged residual trees.

Cut blocks falling in **the medium category** on the visibility grid should be designed using the "Landscape Level" instructions in the Harvest View from Roadside Work Instruction.

Blocks falling into the **high visibility category** will follow the "Landscape level", "Stand level" and "Road design" practices as applicable.

2023 MONITORING UPDATE

Forest stands treated in 2023 that overlapped with low, medium or high viewshed areas are below. These treatments include special management practices that meet PHP's procedure for minimizing impacts to medium and high viewscape areas.

visibility_harvest_type

FID	Shape *	TRTarea	Visability
0	Polygon	11.81	Low
1	Polygon	41.76	Low
2	Polygon	19.1	Moderate
3	Polygon	53.96	Low
4	Polygon	18.59	Low
5	Polygon	14.61	Low
6	Polygon	13.89	Low
7	Polygon	24.97	Low
8	Polygon	20.53	Low
9	Polygon	41.76	Low
10	Polygon	20.53	Low
11	Polygon	14.61	Low
12	Polygon	13.89	Low

SUPPORTING DOCUMENTS/REFERENCES
Viewshed layer in TFM; Harvest View from Roadside Work Instruction

HCVF Category 6 – Traditional Cultural Identity

HCV – Forest Values and Uses

HCV ATTRIBUTE	First Nations Forest Values and Uses	
OPERATIONAL MONITORING PROGRAM		
MANAGEMENT OBJECTIVE	Minimize impacts to First Nations Forest Values and Uses	
INDICATOR	Implement work instruction 'Aboriginal Value – Suspending Operations'	
MONITORING/REPORTING FREQUENCY Annual	MONITORING STRATEGY Monitor any issues identified during annual review of operations plans with First Nations communities. PHP also maintains a public inquiry database, which captures concerns or questions the general public may have regarding planned operations.	
DATA SOURCES	COST AND DIFFICULTY	

The Forest Manager (TFM); Public Inquiry Database	Low

FOREST MANAGEMENT PRESCRIPTION
- If operations plans are known to affect First Nations forest values or uses through a review of annual operating plans or public inquiries, PHP will suspend all activities until a resolution is found.
2023 MONITORING UPDATE
- There were no public inquiries in 2023 related to PHP's operating plans that may affect First Nations.   - There were no harvests in 2023 that occurred in identified medicinal plant areas.
SUPPORTING DOCUMENTS/REFERENCES
PHP Work Instruction 'Aboriginal Values – Suspending Operations'

HCV – Traditional Cultural Identity

HCV ATTRIBUTE	First Nations Traditional Cultural Identity	
OPERATIONAL MONITORING PROGRAM		
MANAGEMENT OBJECTIVE	Minimize impacts to First Nations Traditional Cultural Identity	
INDICATOR	Successful implementation of a Free Prior Informed Consent (FPIC) Agreement with Nova Scotia Mi'kmaq	
MONITORING/REPORTING FREQUENCY Annual	MONITORING STRATEGY Monitor development and implementation of a FPIC Agreement with Nova Scotia Mi'kmaq	
DATA SOURCES The Forest Manager (TFM); Public Inquiry Database	COST AND DIFFICULTY Moderate	
BACKGROUND		
Port Hawkesbury Paper initiated a Free Prior Informed Consent process with the Mi'kmaq Forestry Initiative Committee in 2020. The purpose of this process is to engage Mi'kmaq		

communities that may have legal and/or customary rights affected by PHP's forest management activities so that participation in forest management planning can be conducted to the extent necessary to protect their rights, resource lands and territories.

FPIC is a collective right held by Indigenous Peoples and recognized in international law and other agreements such as the United Declaration on Rights of Indigenous Peoples (UNDRIP 2007). Indigenous peoples have the right (legal and customary) to participate in decisions that could affect their rights, property, cultures and environment. In this broad context, Indigenous peoples have the right to make their own decisions to say 'yes' or 'no' whenever governments or corporations propose actions that could impact their lives and futures. FPIC includes the right to grant, modify, withhold or withdraw approval. It is not a one-time process but may occur at different levels of decision making and multiple times over life of a plan

FSC's
7-Step FPIC Process

STEP 1:
Identify rights holders and their rights

STEP 2:
Prepare for further engagement and agree on scope

STEP 3:
Participatory mapping and assessments

STEP 4:
Inform affected rights holders

STEP 5:
Affected rights holders deliberate and decide

STEP 6:
Verify and formalize FPIC agreement

STEP 7:
Implement and monitor FPIC agreement

FPIC

2023 MONITORING UPDATE

Work on the FPIC process began in the summer of 2020 with the Mi'kmaq Forestry Initiative Committee. Since that time, two working committees have been formed as well as a project plan. The Process Committee is tasked with identifying the appropriate process for conducting the FPIC process and the Technical Committee is responsible for sharing of data and information to assist the process. Currently, an Umbrella Framework Agreement is being developed to outline various collaborative initiatives between First Nations and PHP. These initiatives include FPIC as well as Indigenous Protected & Conservation Areas, Mi'kmaq Forestry Initiative lands, and other areas of mutual interest. An FPIC engagement plan is still to be developed to ensure culturally appropriate engagement is established with Mi'kmaq communities.

PHP has also partnered with KMKNO and the NS Forestry Economic Task Force to develop a 3-year consultation and engagement project with Mi'kmaq communities in Nova Scotia. The purpose is to gather traditional ecological knowledge and learn more about Mi'kmaq cultural values and sites, so appropriate management and conservations can be taken to protect culturally significant sites. Funding is not yet secured for this project.

A request was received from an elder of Membertou First Nation to harvest approximately 80 pole-sized softwood trees for construction of two teepees for Mi'kmaq traditional gathering. The request was approved with no conditions applied.