High Conservation Values Assessment Report

Version 4.4

Prepared for AV Nackawic Inc. | by Abies Consultants | 2022-09-06

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A. HIGH CONSERVATION VALUE FOREST ASSESSMENT

This report contains a detailed analysis of the identification of High Conservation Value Forests (HCVF) on the Freehold forest, hereafter Defined Forest Area (DFA) of AV Group Nackawic (AVN), as a requirement for certification to the Canada's Forest Stewardship Council National Standard.

The Forest Stewardship Council® (FSC®) is an international non-profit organization that envisions "healthy forests providing an equitable sharing of benefits from their use while respecting natural forest processes, biodiversity, and harmony among their inhabitants". In January 2013, FSC Canada membership voted in favour of developing one national standard for Canada, thus replacing Canada's four existing regional FSC Forest Management standards (i.e. National Boreal, Maritimes, British Columbia Standards and interim Great Lakes-St. Lawrence Standards) with a single standard that would apply to the whole country. On June 3rd, 2019, the Forest Stewardship Council Canada announced the launch of a comprehensive new standard for responsible forest management in Canada. After six years of rigorous consultation with industry, environment, and social stakeholders and indigenous groups, the new standard targets the most pressing issues threatening Canadian forests today, including the woodland caribou crisis; the rights of indigenous peoples; workers' rights including gender equity; conservation; and landscape management. The updated standard consolidates FSC's existing, four regional standards into one national standard that has been amended to strengthen Canadian forests and the people, flora and fauna that depend on them. The recommendations range from physical solutions – such as buffer zones around waterways to keep streams and rivers clean -- to ones that thread social fabric, such as indigenous involvement in forestry planning and gender equity throughout the industry.

One of the requirements under the Principle 9 of the FSC National Standard is the determination of High Conservation Value Forests (HCVF) on the forest of the applicant. This report presents background information and decisions relating to the assessment for the presence of HCVF.

1. OVERVIEW

AV Group NB has provided a robust economic stimulant for New Brunswick by transforming forest fibre infrastructures and resources and human resource skills into innovative, higher value-added uses. AV Group NB Inc. is an innovative company that is backed by world class strength, the Aditya Birla Group (ABG), a 40 billion $US corporation in the League of Fortune 500 companies. With operations in 36 countries, the Group is anchored by an extraordinary force of over 130,000 employees, belonging to 42 different nationalities. In 2005, AV Group NB has converted the Nackawic mill, which was commissioned in the early 1970's, to produce dissolving grade pulp that has a production rate of approximately 540 air dry tonnes per day of bleached Kraft dissolving grade pulp which is shipped offshore for use in the textile industry to manufacture rayon. Nackawic is located east of the confluence of the Nackawic Stream and the Mactaquac Headpond on the north shore of the Saint John River approximately 60 km upstream of the City of Fredericton. It is also close to Crabbe Mountain with direct access to the largest and most diverse hardwood forest in New Brunswick.

The wood supply of AV Group NB Inc. – Nackawic mill is provided from two Provincial Crown land (Licenses 1 and 8) and manages nearly 38 000 hectares of company-owned land. This freehold land is the DFA under the scope of this assessment.

AVN is committed to protecting their woodlands and the environment by exceeding forest management performance standards. Among the organisation primary goal is to support the same objectives as the FSC forest management standard.

Furthermore, the intent of this document is to fulfill the requirements of criteria under Principle 9 of the recent National Standard FSC-STD-CAN-01 Version 1 (2018). There are four criteria contained within Principle 9 that deal with the identification and management of HCVFs. Criterion 9.1 entails an assessment to determine the presence of the attributes consistent with HCVFs, appropriate to the scale and intensity of forest management. Criterion 9.2 requires a consultation process with stakeholders and other interested parties, to allow them input into the identification of HCVFs. Criteria 9.3 request that once HCVFs are identified, management strategies that ensure the maintenance of the attributes of the HCVFs must be developed and implemented, consistent with the precautionary approach and proportionate toe the scale, intensity and risk of the management activities. Finally, Criterion 9.4 outlines the need for annual monitoring, to assess the effectiveness of the management strategies.

2. METHODOLOGY

2.1. Purpose

This assessment report intention is to verify the presence of any HCV's within the Freehold forest of AV Nackawic to ensure current values are captured, and managed according to the information, data, or reports gathered. This exercise included an internal review of the 19 questions that form Annex D of the FSC National Forest Stewardship Standard of Canada.

2.2. Assessment

The National Standard contains a HCVF Assessment Framework of 19 questions divided among six categories. The six categories are:

- Forest areas containing globally, nationally or regionally significant concentrations of biodiversity values
- Forest areas containing globally, nationally or regionally significant large landscape-level forests
- Forest areas that are in or contain rare, threatened or endangered ecosystems
- Forest areas that provide basic services of nature in critical situations
- Forest areas that are fundamental to meeting the basic needs of local communities, and
- Forest areas critical to local communities' traditional, cultural identity.

The HCV Framework (Annex D of FSC-STD-CAN-01-2018 V1-0) suggests possible sources of information to look for the presence of HCVFs in the forest and guidance questions that provide the applicant with further help in determining if the values being assessed are eligible. All values, whether proposed by stakeholders or the result of a search of information sources, must be assessed. Each of the six categories of HCV contain a series of questions. Negative answers mean that the forest does not include HCV based on current information. Positive answers lead to further investigation through additional questions. A positive response to any question that is labelled DEFINITIVE means that the elements under consideration are HCVs. However, a negative response to a question labelled DEFINITIVE should not be interpreted to mean that HCV threshold has not been reached. Rather, we strive to answer the questions labelled GUIDANCE. Positive answers indicate the potential presence of HCVs. If questions labelled GUIDANCE are answered positively, it strengthens the potential for the presence of HCVs. Rational justifying why the forest area was identified as an HCV or not shall be provided.

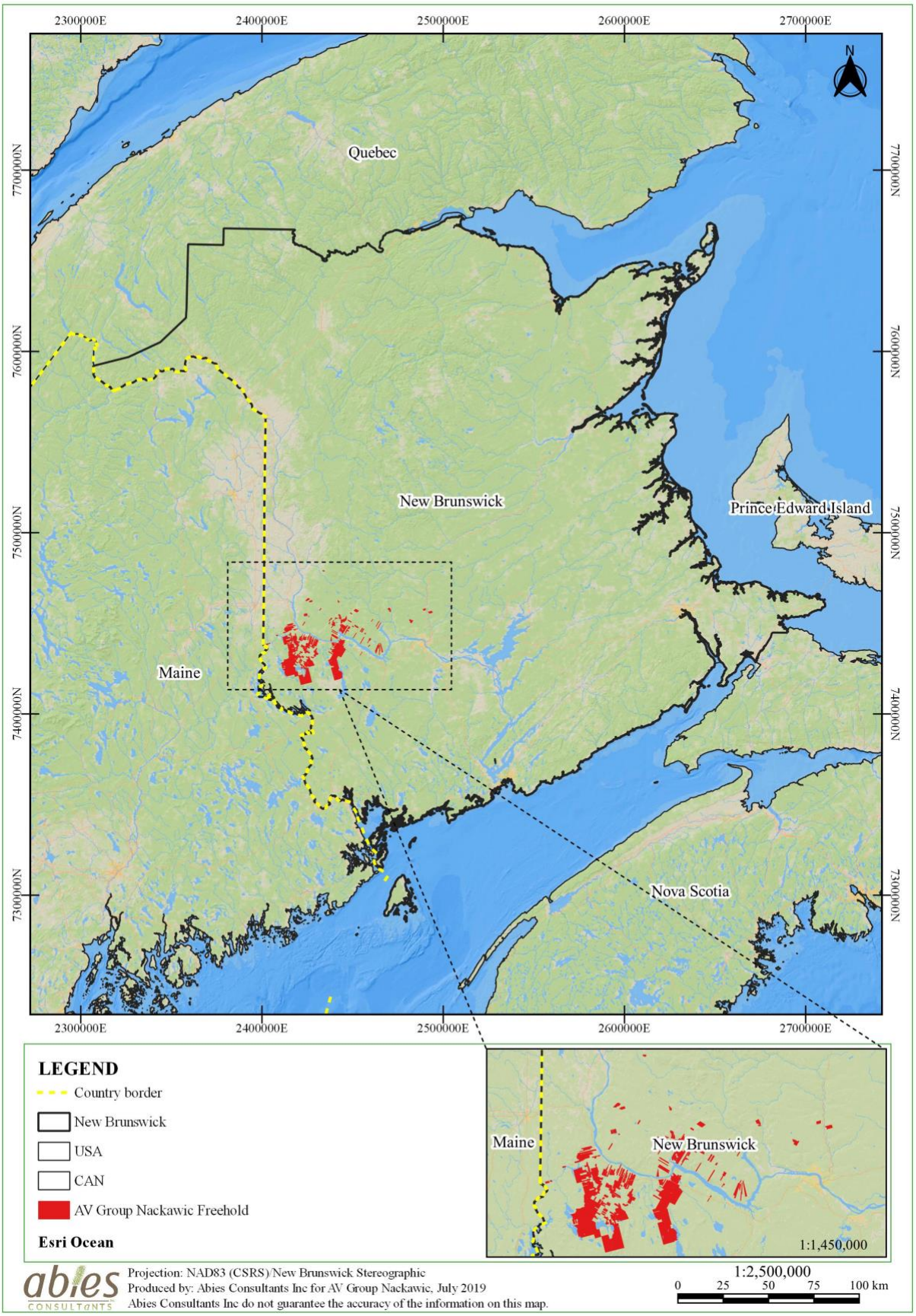
3. FOREST DESCRIPTION

In the Saint John River valley, including the upper portion in the area of review, there are hardwood stands known as the Saint John River Valley Hardwood Forest (SJRHF) (MacDougall and Loo 1998). The forest cover is composed mainly of southern species, especially hardwoods, but about thirty provincial tree species are represented. The heat-loving species are even more common in the Grand Lake Ecoregion, which has the warmest climate in New Brunswick. The vegetation pattern generally reveals valleys and lower slopes covered with red spruce and other coniferous species that can withstand the cool night conditions caused by frost pockets. Typically, the lower mid slopes are covered with mixed forests; mid slopes on coarse acidic soils may support various mixed wood communities; medium to higher elevation hilltops feature tolerant hardwoods; rockier ridges may support red oak and ironwood and on very rocky sites white pine, red spruce or white spruce predominate. More specifically, the SJRHF type is associated with well drained and calcareous upland and riparian areas where the soil layer has been deposited by a watercourse over time. Mature stands are usually dominated by tree species such as sugar maple (*Acer saccharum*), white ash (*Fraxinus americana*), beech (*Fagus grandifolia*), yellow birch (Betula alleghaniensis), and ironwood (Ostrya virginiana) but may also contain white elm (*Ulmus americana*), hemlock (*Tsuga canadensis*), basswood (*Tilia americana*), and butternut (*Juglans cinerea*). Red spruce (P*icea rubens*) and hemlock are generally confined to steep slopes or rocky terrains. Hemlock also occurs with hardwood. The flooded bottomlands in the Eel River Valley whereas calcareous, poorly drained flatlands and low-lying areas of water seepage typically contain eastern white cedar (*Thuja occidentalis*) stands, sometimes punctuated by black ash (*Fraxinus nigra*), red maple (*Acer rubrum*), and white elm. Silver maple (*Acer saccharinum*) is restricted to moist bottomlands or floodplains. These forest stands once dominated the landscape but have been disturbed by more than 200 years of dense settlement and forest harvesting. The SJRHF stands presently occur as small patches, isolated by widespread agricultural lands (MacDougall and Loo 1998; NBDNR 2007).

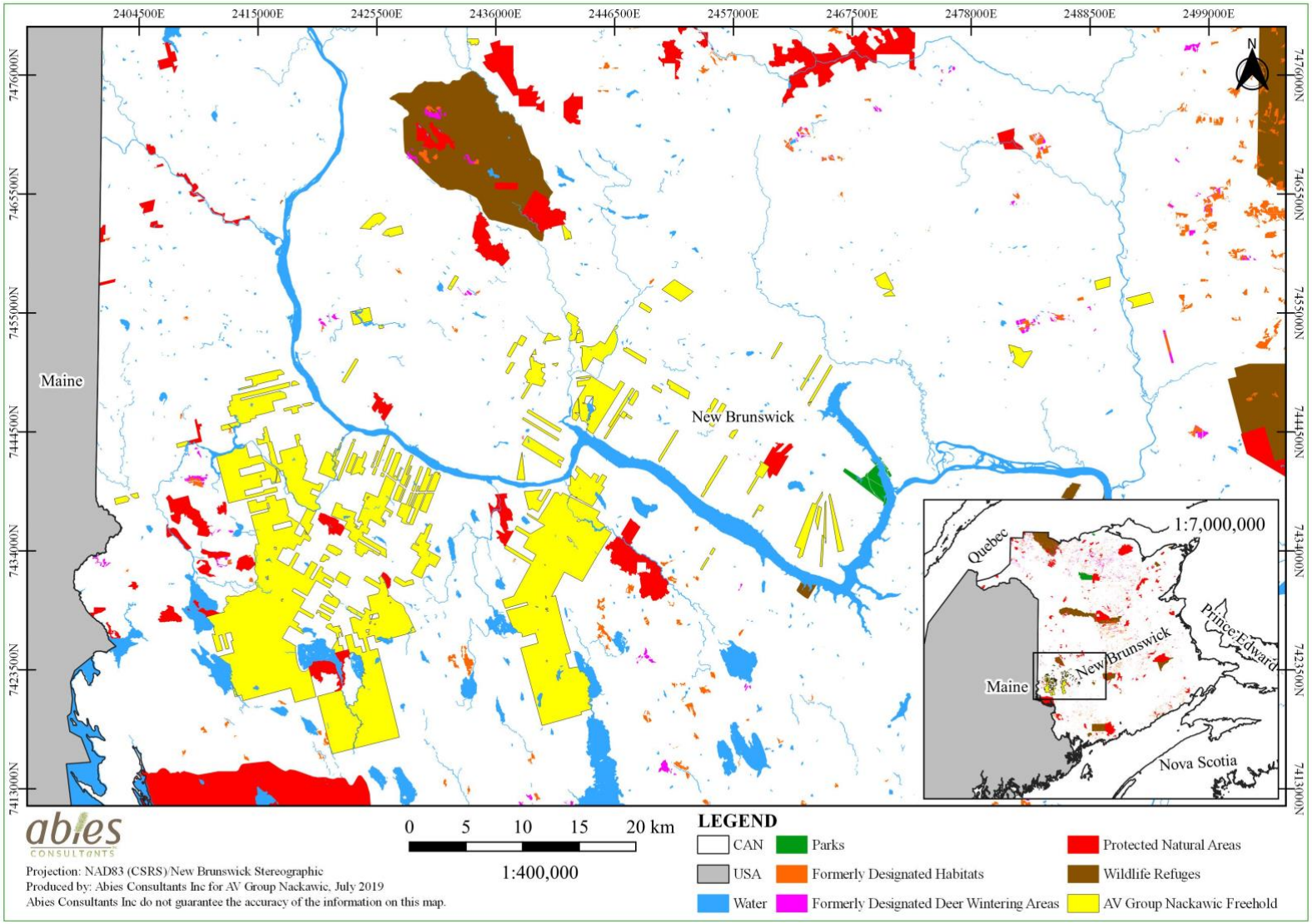
Most of the head pond is in the Valley Lowlands Ecoregion (Figure 9.2), which is the largest ecoregion in New Brunswick and where almost all the AV Group Nackawic freehold is contained. This region is diverse and contains a large group of vegetation species generally associated with more southern areas.

The Meductic Ecodistrict within the ecoregion is a rolling lowland area that encompasses the middle Saint John River valley. The dominant geographic feature of this ecodistrict is the Saint John River. The elevation within the river valley and surrounding areas is rarely greater than 100 m (NBDNR 2007).

Map 1. Location of the AV Group Nackawic Freehold forest.



Map 2. Conservation areas surrounding AV Group Nackawic Freehold forest.



4. ASSESSMENT FOR THE PRESENCE OF HIGH CONSERVATION VALUES

4.1. HCV 1 – Species diversity

HCV 1 covers significant concentrations of biodiversity, recognized as unique or outstanding. Concentrations of biological diversity includes endemic species, and rare, threatened or endangered species, that are significant at global, regional or national levels.

4.1.1. Question 1) Does the forest contain species at risk or potential habitat of species at risk as listed by international, national or territorial/provincial authorities?

Assessment:

Species at Risk (SAR) are defined in this CER as species listed as Extirpated, Endangered, Threatened, or Special Concern under the NB SARA or the federal SARA, or by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). The purposes of the NB SARA and federal SARA are to prevent wildlife species (including plants) from becoming extinct (extirpated); to provide for the recovery of species that are Extirpated, Endangered, or Threatened; and to manage species of Special Concern to prevent them from becoming Endangered or Threatened. While only species listed as Extirpated, Endangered, or Threatened in Schedule 1 of the federal SARA and those species listed under Schedule A of the Prohibitions Regulation of NB SARA currently have regulatory protection, the definition above also includes those species on the NB SARA List of Species at Risk Regulation and those listed by COSEWIC that are candidates for further review and may become protected within the timeframe of this Project. The federal SARA is co-administered by Environment Canada, Parks Canada Agency, and Fisheries and Oceans Canada. NB SARA is administered by the New Brunswick Department of Natural Resources (NBDNR).

Species of Conservation Concern (SOCC) are not listed under federal or provincial legislation but are considered rare in New Brunswick and/or the long-term sustainability of their populations has been evaluated as tenuous.

For this Assessment, SOCC are defined as species that have been ranked in the province by the Atlantic Canada Conservation Data Centre (AC CDC) as S1 or S2, or S3 with a Canadian Endangered Species Conservation Council (CESCC) general status rank of at risk, may be at risk, or sensitive.

Note: Status in the table used are those stipulated in the Species at Risk Public Registry of the Natural Resources Department of the Government of New Brunswick. The registry is available online at https://www1.gnb.ca/0078/SpeciesAtRisk/search-e.asp.

Table 1. New Brunswick species at risk – Arthropods.

***Scientific Name* / Common Name Status**	**Risk Assessment and Decision**
Cicindela marginipennis Cobblestone Tiger Beetle Endangered	**Status Justification** ▪ Cobblestone Tiger Beetle was assessed as Endangered by COSEWIC in 2008 and listed as Endangered under Schedule 1 of SARA in 2011. ▪ This distinctive species of tiger beetle has a fragmented distribution with a very small extent of occurrence and area of occupancy and is currently only found in two small regions of the St. John River system. There is evidence for decline of habitat and population in one region and the pressures on the habitat from development and recreation appear to be continuing. ○ The population size was estimated to be 3588-11655 individuals (COSEWIC 2008), based upon mark-release-recapture experiments conducted in 2007 (Webster 2008).
	Habitat ▪ It is currently known from 8 sites in New Brunswick (3 on Grand Lake, 5 on Saint John River). These represent the only known occurrences of the species in Canada. All these sites are located on non-federal land. The percentage of the global population located in Canada is less than 10%. ▪ In general, Cobblestone Tiger Beetles require sparsely-vegetated shoreline habitat, high beaches that are infrequently flooded, and a high cobblestone content with fine sand and gravel in between. These areas are typically found at the upstream end of islands, lakeshore, and river islands
	Threats to Species and Habitat ▪ Fragmentation of its habitat, small area of occupancy, and continued pressures on its habitat. ▪ Current and historic threats to the species include development and shoreline alterations, off-road vehicle use, dam construction and habitat fragmentation, as well as specimen collection, pollution and flooding.
	Current Management ▪ Under SARA, recovery of the species includes monitoring and surveying populations, habitats, and threats; stewardship and education; habitat management and conservation; and research to assist in recovery efforts. ▪ AV Group Nackawic do not have a species specific management plan/approach in-place.
	Decision The assessment concluded that the Cobblestone Tiger Beetle is **not considered as HCV**. ▪ Rationale: ○ The current distribution is at least maintained at each site where it is currently found. ○ Suitable habitat is available and is sufficient to support the species' current distribution, and suitable unoccupied habitat exists at both locations as well. ○ Habitat and needs of this species are not likely to be compromised by forestry activities in New Brunswick. ○ Known occurrences are outside of the Freehold.

***Scientific Name* / Common Name** Status	**Risk Assessment and Decision**
	Sources ▪ Environment Canada. 2013. Recovery Strategy for the Cobblestone Tiger Beetle (Cicindela marginipennis) in Canada. Species at Risk Act Recovery Strategy Series. Environment Canada, Ottawa. v + 18 pp. ▪ Kinsley, B. 2014. Cicindela marginipennis. The IUCN Red List of Threatened Species 2014: e.T4851A21424216. https://dx.doi.org/10.2305/IUCN.UK.2014-1.RLTS.T4851A21424216.en.
Coenonympha nipisiquit Maritime Ringlet Endangered	**Status Justification** ▪ COSWEIC designated it as Endangered in April 1997. Status was re-examined and confirmed in May 2000 and in April 2009. It has been listed as endangered in Schedule 1 of the Species at Risk Act since 2003. It is also listed as Endangered under the New Brunswick Endangered Species Act (S.N.B. 1996, c. E-9.101) and as Threatened under the Québec Act respecting threatened or vulnerable species (L.R.Q. c. E-12.01). ▪ NatureServe (2010) attributed the global conservation rank of G1 (Critically Imperiled) for this species, the national rank of N1 (Critically Imperiled) in Canada as well as a subnational rank of S1 (Critically Imperiled) in New Brunswick and Québec. The species has not been evaluated by the International Union for the Conservation of Nature (IUCN).
	Habitat ▪ Extremely restricted distribution within a small area near Chaleur Bay in northern New Brunswick (six sites, two of which are the result of introductions) and the southern coast of the Gaspé Peninsula in Québec (four sites). ▪ Critical habitat for the Maritime Ringlet is identified in the recovery strategy at the nine saltwater marches where permanent populations of the species are currently located (three sites in Quebec, six in New Brunswick), including the two salt marshes in New Brunswick where introduction efforts have been performed. o In New Brunswick, the Maritime Ringlet is known from six locations: four natural sites within Nepisiguit Bay at Peters River (Beresford), Daly Point, Carron Point, and Bass River (Webster, 1997; New Brunswick Maritime Ringlet Recovery Team, 2005); and two introduced populations at Bas Caraquet and Rivière du Nord, about 45 km northeast of Bathurst (Webster, 2002).
	Threats to Specie and Habitat ▪ The main threats to the species are waterfront development, marsh infilling, the effects of climate change (water levels and erosion), residential pesticides and sewage as well as industrial effluents. ▪ The limited distribution and the isolation of populations results in an inherently high probability of extirpation for all sites. o This distribution results in a reduced probability of long-term persistence due to reduced genetic variability as a result of limited or lack of exchange of individuals and low potential for recolonization of sites that may be lost.
	Current Management ▪ Under SARA, recovery of the species includes monitoring and surveying populations, habitats, and threats; stewardship and education; conservation; to assist in recovery efforts. ▪ AV Group Nackawic do not have a species specific management plan/approach in-place.
	Decision The assessment concluded that the Maritime Ringlet is **not considered as HCV**.

***Scientific Name* / Common Name Status**	**Risk Assessment and Decision**
	▪ Rationale: o Habitat and needs of this species are not likely to be compromised by forestry activities in New Brunswick. o Known occurrences are outside of the Freehold.
	Sources ▪ Environment Canada. 2012. Recovery Strategy for the Maritime Ringlet (Coenonympha nipisiquit) in Canada. Species at Risk Act Recovery Strategy Series. Environment Canada, Ottawa. iv + 27 pp.
Danaus plexippus Monarch Special Concern	**Status Justification** ▪ The Eastern and Western Monarch populations have declined dramatically over the past 15 to 20 years. ▪ The Monarch was listed as a species of Special Concern under Canada's Species at Risk Act (SARA) in 2003, and New Brunswick's Species at Risk Act in 2012. NatureServe Conservation Status for New Brunswick is Vulnerable for both breeding and migrant populations. ▪ COSEWIC designated it as Special Concern in April 1997. Status was re-examined and confirmed in November 2001 and in April 2010.
	Habitat ▪ Monarch is a migratory species. In Canada, two mostly disjunct migratory populations of the Monarch occur: the Eastern population and the Western population. The Eastern population's annual breeding range extends from the Gulf of Mexico coastal states (Texas, Louisiana, Mississippi, Alabama, Georgia, and Florida) northwards to southern Canada (Alberta to New Brunswick and Nova Scotia), and from the Great Plains States and Prairie Provinces eastwards to the Atlantic Coast and the Maritime Provinces (COSEWIC, 2010). ▪ In New Brunswick, the Monarch breeds in scattered locations due to the limited distribution of milkweed. Monarch larvae feed only on milkweeds (Asclepias spp.) and related genera.
	Threats to Specie and Habitat ▪ The primary threats facing Monarch include the degradation and loss of overwintering habitat in Mexico and along the Californian coast, the widespread use of pesticides and herbicides throughout their breeding grounds, climate change, severe weather events, succession and conversion of breeding and nectaring habitat, and for the Eastern population, the impacts of Bark Beetles on overwintering habitat.
	Current Management ▪ Canada has worked cooperatively with the United States and Mexico to establish management goal and near-term population target. The three countries work towards a target of six hectares of occupied overwintering habitat in Mexico by 2020. ▪ In Atlantic Canada, the Maritimes Butterfly Atlas was initiated in 2010 to provide comprehensive and systematic surveys to improve understanding of the numbers, distribution, and status of butterflies throughout the Maritimes (ACCDC, 2013b). ▪ AV Group Nackawic do not have a species specific management plan/approach in-place. (Does identification of Asclepias could be covered in the Forest Inventory Program or Field Survey ????).
	Decision The assessment concluded that the Monarch is **not considered as HCV**. ▪ Rationale: o Habitat and needs of this species are not likely to be compromised by forestry activities in New Brunswick.

***Scientific Name* / Common Name Status**	**Risk Assessment and Decision**
	○ Analysis of the Monarch Watch Domestic Tag Recovery for the years 2017, 2018 and 2019 (2020 was not available at the time of this assessment) reveal a low level of observed or recovered tagged monarchs in New Bruswick (total of 5). • 2x Fredericton (residential); 1x Quispamsis (Hammond River Park); 1x Saint John; 1x Saint-André. ○ There are no known occurrences of Monarch breeding areas within the Freehold.
	Sources ▪ Environment and Climate Change Canada. 2016. Management Plan for the Monarch (Danaus plexippus) in Canada. Species at Risk Act Management Plan Series. Environment and Climate Change Canada, Ottawa. iv + 45 pp. ▪ Monarch Watch (2020), (available at https://monarchwatch.org/). ▪ NatureServe Explorer: *Danaus plexippus*, Monarch (2020), (available at https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.108245/Danaus_plexippus).
Ophiogomphus howei Pygmy Snaketail Special Concern	**Status Justification** ▪ The species was assessed as Special Concern by COSEWIC in 2008, and was listed as Special Concern under Schedule 1 of the Species at Risk Act in 2011. ▪ In New Brunswick, the species is listed under Species at Risk Act, SC 2012, c. 6, O.C. 2013-13. In New Brunswick, the species' General Status rank is May be at Risk (2008) and it is not listed under the New Brunswick Endangered Species Act.
	Habitat ▪ Pygmy Snaketail, in Canada, is known from 11 sites in New Brunswick and 1 site in Ontario. ▪ Locations appear to be restricted to large, fast-flowing rivers and their tributaries. The 11 locations found in New Brunswick are distributed over 5 river systems. ▪ Pygmy Snaketails are thought to be a habitat specialist given that the larval form requires fast flowing rivers greater than 10m in width, a moderate to low gradient stream bed with significant areas of fine sand and/or pea gravel substrate (COSEWIC 2008). The Pygmy Snaketail life cycle requirements are poorly understood. Habitat requirements for the species are complex, given the differences in habitat requirements of the adult and larval forms. ▪ Larvae drifting downstream from where eggs are laid then the majority of their adult life is spent in the upper canopy of riparian area.
	Threats to Specie and Habitat ▪ There are several knowledge gaps with regards to characterizing threats to this species. Dam construction is a threat of high concern in Ontario. All other threats are either of low concern or the impact is unknown and include; dam construction, pollution, invasive species, residential development, forest harvesting and agriculture land use, wakes from boats, and vehicle traffic on roads.
	Current Management ▪ Although not targeted towards the conservation of Pygmy Snaketail explicitly, many of the rivers where the species is known to occur have active watershed-based environmental nongovernment organizations working on conservation initiatives. Assessments of water quality and the impact of anthropogenic activities have been conducted for several rivers in New Brunswick. In addition, the Saint John River State of the Environment Report was released in 2011 and is available on the web site of the Canadian Rivers Institute. ▪ AV Group Nackawic do not have a species specific management plan/approach in-place.

***Scientific Name* / Common Name** **Status**	**Risk Assessment and Decision**
	Decision The assessment concluded that the Pygmy Snaketail is **not considered as HCV**. ▪ Rationale: o Habitat and needs of this species are not likely to be heavily compromised by forestry activities in New Brunswick. o Forest harvesting and agricultural land use along watercourses supporting Pygmy Snaketail has the potential to impact habitat through sedimentation from surface runoff, clearing of vegetation near the watercourse, as well as alteration of adult habitat through harvesting of forests surrounding the rivers. However, the extent to which this threat is impacting habitat is currently unknown and warrants further investigation. • Operational guidelines of forest management implemented by AV Group Nackawic already included the use of riparian buffer zones which limit the alteration to the watercourse and its surrounding vegetation. o Known occurrences are outside of the Freehold.
	Sources ▪ Environment Canada. 2013. Management Plan for the Pygmy Snaketail (Ophiogomphus howei) in Canada. Species at Risk Act Management Plan Series. Environment Canada, Ottawa. iii + 13 pp. ▪ Abbott, J.C., Donnelly, T. & Paulson, D.R. 2017. Ophiogomphus howei. The IUCN Red List of Threatened Species 2017: e.T15366A65817976. https://dx.doi.org/10.2305/IUCN.UK.2017-3.RLTS.T15366A65817976.en.
Gomphus ventricosus Skillet Clubtail Endangered	**Status Justification** ▪ Skillet Clubtail was assessed by COSEWIC as Endangered in 2010 and listed in Schedule 1 of the Species at Risk Act (SARA) in 2017. The species was listed under the New Brunswick Species at Risk Act in May 2013.
	Habitat ▪ Skillet Clubtail habitat types are forest and inland wetland, such as permanent rivers/streams/creeks (includes waterfalls). ▪ It occurs at midsized to large pristine rocky and sandy rivers with fine sediment for larval habitat, usually slow to moderate current. Larvae burrow in bottom substrates. Adult Skillet Clubtail are thought to occupy forest canopy, bog, or field habitats relatively close to suitable rivers for larvae (COSEWIC 2010). ▪ In Canada, the species' presence has been confirmed only in New Brunswick along the Saint John River and its tributaries – the Salmon River and Canaan River.
	Threats to Species and Habitat ▪ The species is considered (or assumed to be) intolerant of changes in habitat and degradation of water quality (e.g., siltation or low oxygen) (COSEWIC 2010). ▪ Anthropogenic habitat change (e.g., residential and commercial development, annual and perennial non-timber crops, and logging and wood harvesting) as well as roads and recreational use (boats) likely have the greatest potential to threaten Skillet Clubtail. Pollution and invasive species, along with an existing dam, also may have an impact.
	Current Management

***Scientific Name* / Common Name Status**	**Risk Assessment and Decision**
	▪ Under SARA, recovery of the species includes research and surveying populations; laws, regulations and codes enforcements regarding household sewage and urban waste water; conservation; to assist in recovery efforts. ▪ AV Group Nackawic do not have a species specific management plan/approach in-place.
	Decision The assessment concluded that the Skillet Clubtail is **not considered as HCV**. ▪ Rationale: o Although information on habitat requirements is relatively limited, the continued presence of the species on the Saint John River system suggests that sufficient suitable habitat is available to support the species. The COSEWIC status report states that the Canadian population is likely stable at present, suggesting that achieving population and distribution objectives is feasible. o Forest harvesting and agricultural land use along watercourses supporting Skillet Clubtail has the potential to impact habitat through sedimentation from surface runoff, clearing of vegetation near the watercourse, as well as alteration of adult habitat through harvesting of forests surrounding the rivers. However, the extent to which this threat is impacting habitat is currently unknown and warrants further investigation. • Operational guidelines of forest management implemented by AV Group Nackawic already included the use of riparian buffer zones which limit the alteration to the watercourse and its surrounding vegetation. o Known occurrences are outside of the Freehold.
	Sources ▪ Environment and Climate Change Canada. 2018. Recovery Strategy for the Skillet Clubtail (Gomphus ventricosus) in Canada [Proposed]. Species at Risk Act Recovery Strategy Series. Environment and Climate Change Canada, Ottawa. vi + 25 pp. ▪ Paulson, D.R. 2018. Gomphurus ventricosus (amended version of 2017 assessment). The IUCN Red List of Threatened Species 2018: e.T51179182A125527572. https://dx.doi.org/10.2305/IUCN.UK.2017-3.RLTS.T51179182A125527572.en.

Table 2. New Brunswick species at risk – Birds.

Haliaeetus leucocephalus Bald Eagle Endangered	**Status Justification** ▪ In New Brunswick, it is regionally endangered since 1976, but declines have been reversed especially in Maritimes provinces. ▪ As a matter of facts, COSEWIC designated it Not at Risk in 1984 and the species is no longer listed in the SARA. Least Concern as per IUCN Red List (2016).
	Habitat ▪ Bald Eagles live near water and favor coasts and lakes where fish are plentiful. ○ In New Brunswick, a number of coastal islands provide suitable habitat and are common nesting sites. In winter, the bird is frequently found in the southwestern part of the province – a good source of food since the Bay of Fundy does not freeze over. ▪ New Brunswick has two different bald eagle populations. One is a permanent resident and spends it winters here. The other migrates annually to the southeastern United States. The eagle can be found throughout the province, but is more common in the southwestern region near open water. ▪ It uses sticks and plant material to build its nest in the top of a tall tree – often a large white pine. It usually uses the same nest for a number of years.
	Threats to Species and Habitat ▪ Illegal shooting and lead poisoning are among the primary threats to bald eagles. Habitat loss, power line electrocution and wind energy also play a role in eagle deaths.
	Current Management ▪ AV Group Nackawic do have a species specific management approach in-place for Bald Eagle: ○ The objective for all forestry operations is to minimise the disturbance to nesting raptors while maintaining the integrity of known nest sites. Three types of buffers shall be maintained around Bald Eagle nest sites. The width of the buffers considers the species tolerance to disturbance during nesting and the species status in New Brunswick as identified by DNR (Status of Wildlife in New Brunswick Report, DNR 2001).
	Decision The assessment concluded that the Bald Eagle is **considered as HCV**. ▪ Rationale: ○ The species is already with special prescription in New Brunswick forestry and its status is evaluated as Least Concern or Not at Risk as per SARA, COSEWIC and IUCN.
	Sources ▪ BirdLife International. 2016. Haliaeetus leucocephalus. The IUCN Red List of Threatened Species 2016: e.T22695144A93492523. https://dx.doi.org/10.2305/IUCN.UK.2016-3.RLTS.T22695144A93492523.en. ▪ Park of Canada and associated National Historic Sites of Canada. Species at Risk Act Action Plan Series. Parks Canada Agency, Ottawa. v + 20 pp.
Hirundo rustica Barn Swallow Threatened	**Status Justification** ▪ This species has experienced very large declines that began somewhat inexplicably in the mid to late 1980s in Canada. ▪ In Canada, the Barn Swallow and its nests and eggs are protected under the Migratory Birds Convention Act, 1994. It is ranked as sensitive in New Brunswick. ▪ NatureServe (2010) rank the Barn Swallow as Vulnerable in New Brunswick and CESCC (2006)

	▪ Barn Swallow populations in Canada have decreased most profoundly in the Maritimes, where annual decrease over the most recent 10-year period was 8.1% in New Brunswick. ▪ In 2011, the COSEWIC assessed the barn swallow as Threatened.
	Habitat ▪ Swallows are often associated with grasslands and agricultural fields, but they often forage over water as well. In many cases, the loss of natural nesting sites has led these species to use human-made or human-altered structures for nesting.
	Threats to Species and Habitat ▪ Changes in the availability of aerial insects — their main food source — during the breeding season, as well as habitat degradation along migration routes and on wintering grounds. Pesticide use is another problem, decreasing the abundance of aerial insects that swallows rely on. These chemicals can accumulate in the bodies of adult birds and their young, affecting health and reproduction. ▪ Loss of breeding sites is an important threat. In the case of the barn swallow, many old barns have been demolished or replaced with new barns that have metal roofs, which become too hot in the summer for nestlings. Converting abandoned, marginal farmland to forested conditions removes the open habitats these birds need for foraging. ▪ Predators such as raccoons, rats, mice, squirrels and feral cats can feed on Barn Swallow nest.
	Current Management ▪ Species at risk, their residences, and their habitat are therefore protected by existing national park regulations and management regimes. In addition, the Species at Risk Act (SARA) prohibitions protecting individuals and residences apply automatically when a species is listed, and all critical habitat in national parks and national historic sites must be legally protected within 180 days of being identified.
	Decision The assessment concluded that the Barn Swallow is **not considered as HCV**. ▪ Rationale: o Habitat and needs of this species are not likely to be heavily compromised by forestry activities in New Brunswick.
	Sources ▪ BirdLife International. 2019. Hirundo rustica. The IUCN Red List of Threatened Species 2019: e.T22712252A137668645. https://dx.doi.org/10.2305/IUCN.UK.2019-3.RLTS.T22712252A137668645.en. ▪ COSEWIC. 2011. COSEWIC assessment and status report on the Barn Swallow Hirundo rustica in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. ix + 37 pp. ▪ Wildlife Preservation Canada. Swallows of the Maritimes. Available online at https://wildlifepreservation.ca/maritime-swallows/
Bucephala islandica Barrow's Goldeneye Eastern population Special Concern	**Status Justification** ▪ The Eastern population of Barrow's Goldeneye in North America was assessed in 2000 by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) as a species of special concern and was listed as such in Schedule 1 of the Species at Risk Act (SARA) in 2003. ▪ In the Atlantic provinces the species has no legal protection under New Brunswick's Endangered Species Act (S.N.B., 1996, c. E-9.101), Nova Scotia's Endangered Species Act (S.N.S. 1998, c. 11) or Prince Edward Island's Wildlife Conservation Act (RSPEI 1988, c. W-41). It is also protected under the Newfoundland and Labrador Endangered Species Act.
	Habitat

	▪ Barrow's Goldeneyes use small lakes (< 15 ha) located at high altitudes (> 500 m) in areas characterized by rugged terrain for mating and rearing their young. They prefer fishless lakes and lakes at the head of watersheds. ▪ During wintering period, the Barrow's Goldeneye is closely associated with large rocky intertidal areas that support dense populations of brown algae (Fucaceae). ▪ The eastern Barrow's overwinter in the Gulf of St Lawrence, along the northern and eastern shores of New Brunswick and along the coast of PEI.
	Threats to Species and Habitat ▪ In eastern Canada, there has been a significant reduction in the amount of suitable breeding habitat due to logging and fish introduction. ▪ Hunting is considered as a threat to the species even if the number of birds harvested each fall is low a small continuous harvest could have a significant impact on this population. ▪ Forest exploitation is a threat to the species' breeding grounds. It destroys nests, reduces the number of potential nest sites, exposes young to predation and increases disturbance by making lakes more accessible. ▪ In addition, lakes that were originally fishless have now been stocked with brook trout, and there are indications that the presence of these fish could reduce the quality of lakes for Barrow's Goldeneye.
	Current Management ▪ The Barrow's Goldeneye Eastern population is protected by the federal Migratory Birds Convention Act. Under this Act, it is prohibited to kill, harm, or collect adults, young, and eggs. ▪ Management actions focus on management, conservation and stewardship of the species and its habitat; research and monitoring; outreach and communication. The Management Plan for the Barrow's Goldeneye, Eastern Population is to maintain at not less than 6800 individuals throughout its Canadian range. ▪ AV Group Nackawic do not have a species specific management plan/approach in-place.
	Decision The assessment concluded that the Barrow's Goldeneye Eastern population is **not considered as HCV**. ▪ Rationale: ○ Known occurrences are outside of the Freehold.
	Sources ▪ COSEWIC Status Appraisal Summary on the Barrow's Goldeneye Bucephala islandica Eastern Population, in Canada (2011-09-09) ▪ Environment Canada. 2013. Management Plan for the Barrow's Goldeneye (Bucephala islandica), Eastern Population, in Canada. Species at Risk Act Management Plan Series. Environment Canada, Ottawa. iv + 16 pages. ▪ Nature NB. About the Barrow's Goldeneye Survey (Winter 2019). Available online at http://www.naturenb.ca/2019/03/15/barrows-survey/.
Catharus bicknelli Bicknell's Thrush Threatened	**Status Justification** ▪ COSWIC designated it as Special Concern in April 1999. Status re-examined and designated Threatened in November 2009. ▪ It is designated as Threatened in New Brunswick. The AC CDC lists this species as Imperiled (AC CDC 2016).
	Habitat ▪ The Bicknell's Thrush is a habitat specialist, generally associated with undisturbed dense habitat or disturbed areas undergoing vigorous succession (mid–successional) of Balsam Fir–dominated habitat and high stem densities (>10,000–15,000 stems/ha).

	▪ In montane/high–elevation areas, the Bicknell's Thrush selects undisturbed habitats and regenerating forests disturbed by fir waves, windthrows, ice and snow damage, fire, and insect outbreaks (e.g. spruce budworm infestation) and characterized by standing dead conifers and dense regrowth of Balsam Fir. ▪ In coastal areas it selects dense spruce–fir stands maintained by cool sea breezes and a high precipitation regime. In highland–industrial forests, the Bicknell's Thrush may be found in dense coniferous or sometimes dense mixed second–growth regenerating stands.
	Threats to Species and Habitat ▪ The conversion of Hispaniola Island (Haiti and Dominican Republic) lands for human uses is likely the main driving factor of the species decline since is the stronghold of the species' wintering range. There is no indication that this phenomenon is slowing down. ▪ Management practices, such as pre–commercial thinning, decrease breeding habitat in the medium term by significantly reducing Balsam Fir stem density. ▪ The rapid expansion of communication towers, "green–energy"/ wind turbines and recreational projects in the Bicknell's Thrush breeding range also contributes to habitat loss and fragmentation.
	Current Management ▪ Guides to best management and stewardship practices for the Bicknell's Thrush have been prepared for the forestry industry in Nova Scotia, New Brunswick and Quebec (Campbell et al. 2005; Campbell and Whittam 2006; Bredin and Whittam 2009; Rioux and Poulin 2009; Bussière and Julien, 2012a; Bussière and Julien, 2012b) and for the wind power industry (Julien 2012). ▪ AV Group Nackawic do not have a species specific management plan/approach in-place.
	Decision The assessment concluded that the Bicknell's Thrush is **not considered as HCV**. ▪ Rationale: ○ Known occurrences are outside of the Freehold.
	Sources ▪ COSEWIC. 2009. COSEWIC assessment and status report on the Bicknell's Thrush Catharus bicknelli in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 44 pp. (www.sararegistry.gc.ca/status/status_e.cfm). ▪ Environment and Climate Change Canada. 2016. Recovery Strategy for the Bicknell's Thrush (Catharus bicknelli) in Canada [Proposed], Species at Risk Recovery Strategy Series, Environment and Climate Change Canada, Ottawa, viii + 72 pp. ▪ Stantec. ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT: FUNDY ISLES SUBMARINE CABLES REPLACEMENT PROJECT, NEW BRUNSWICK, Section 6. Assessment of Environmental Effects on the Terrestrial Environment. Available online at https://www2.gnb.ca/content/dam/gnb/Departments/env/pdf/EIA-EIE/Registrations-Engegistrements/documents/EIARegistration1490/EIARegistration1490-Section6.pdf.
Dolichonyx oryzivorus Bobolink Threatened	**Status Justification** ▪ COSWIC designated it as Threatened in April 2010. ▪ IUCN Red List categorized it as Least Concern (2012). Still, the population is decreasing globally.
	Habitat ▪ The Bobolink originally nested in the tall-grass prairie of the mid-western U.S. and south central Canada. Since the conversion of the prairie to cropland and the clearing of the eastern forests, the Bobolink has nested in forage crops.

	▪ It also occurs in various grassland habitats including wet prairie, graminoid peatlands and abandoned fields dominated by tall grasses, remnants of uncultivated virgin prairie, no-till cropland, small-grain fields, restored surface mining sites and irrigated fields in arid regions. ▪ New Brunswick as well as the Global range of the Bobolink in Canada are consider in the breeding range. ▪ Bobolink abundance and density are positively associated with a moderate litter depth, high lateral litter cover and high grass-to-legume ratios, an abundance of small shrubs as perches and a high percent of forb cover.
	Threats to Species and Habitat The main causes of the decline in Bobolink populations have been identified as: ▪ Incidental mortality from agricultural operations such as haying that destroy nests and kill adults. ▪ Habitat loss caused by the conversion of forage crops to intensive grain crops and other row crops. Most of the prairie's habitat was converted to agricultural land over a century ago, and at the same time the forests of eastern North America were cleared to hayfields and meadows that provided habitat for the birds. ▪ Habitat fragmentation which promotes higher rates of predation on nests located near edges. The Bobolink is generally sensitive to vegetation structure and composition in its habitat. ▪ Pesticide use on breeding and wintering grounds, which may cause both direct and indirect mortality.
	Current Management ▪ In Canada, habitat protection is accomplished primarily through voluntary conservation programs (e.g. North American Waterfowl Management) and private conservation groups (e.g. Ducks Unlimited Canada, Nature Conservancy of Canada) which indirectly protect Bobolink habitat. Also, the Permanent Cover Program restored close to 522 000 ha of unproductive grassland. ▪ AV Group Nackawic do not have a species specific management plan/approach in-place.
	Decision The assessment concluded that the Bobolink is **not considered as HCV**. ▪ Rationale: o Habitat and needs of this species are not likely to be heavily compromised by forestry activities within the Freehold.
	Sources ▪ BirdLife International. 2016. Dolichonyx oryzivorus. The IUCN Red List of Threatened Species 2016: e.T22724367A94863313. https://dx.doi.org/10.2305/IUCN.UK.2016-3.RLTS.T22724367A94863313.en.
Wilsonia canadensis Canada Warbler Threatened	**Status Justification** ▪ The species was designated as Threatened by the COSEWIC in 2008 and since 2010, has been listed according to the same status under Schedule 1 of the Canada's Species at Risk Act (SARA). Canada Warbler is listed as Threatened in New Brunswick (S.N.B. 2012, c. 6). ▪ The species is also on the US-Canada Watch List, the Species of High Tri-National Concern List, and the US-Canada Stewardship List of Partners in Flight (Partners in Flight Science Committee 2012) because of declining trends and significant threats.
	Habitat ▪ Canada Warbler breeds in a variety of habitats that differ across its range, but is almost always associated with moist forests with a dense, deciduous shrub layer, complex understory, and available perch trees. A breeding range-wide study found Canada Warbler densities to be generally higher in mixedwood and deciduous stands with tall trees compared to other habitats (Haché et al. 2014).

- In the Maritimes (Maine, New Hampshire, Vermont, New Brunswick,and Nova Scotia), documented habitat preferences and descriptions include but are not limited to mature cedar swamps and other wet habitats, complex, mature or regenerating mixed forest, partial cuts, and shrublands (Maritimes Breeding Bird Atlas, unpublished data).
- In southern New Brunswick, Canada Warbler breeding habitats are similar in vegetation composition to Nova Scotia, but with more sphagnum moss and less cinnamon fern. Bare ground has been observed at some sites, as well as a prevalence of balsam fir regeneration. In some areas of New Brunswick and PEI, this species uses more calcareous wetlands, including seeps in upland hardwood habitats with white/yellow birch and black ash.
- 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. The identification of critical habitat will be included in a revised recovery strategy or an action plan.

Threats to Species and Habitat

Since Canada provide breeding habitat, only threats to breading habitat were assessed.

- Removal of shrub layer. High shrub density is considered a critical feature of Canada Warbler's breeding habitat. Therefore, activities that remove or potentially destroy the shrub cover (such as silvicultural practices (e.g. herbicides, weeding, thinning) or harvesting (e.g. selective harvesting, clear cut) may render the habitat unsuitable for the species.
- Forest harvesting. Forest harvesting, in general, can have short term negative impacts on nesting birds by disrupting breeding activities (Hobson et al. 2013). The nests and/or eggs can be inadvertently harmed or disturbed as a result of clearing trees and other vegetation (e.g., pre-commercial thinning). Nesting failure could also result from disruptive activities experienced by a nesting bird. Hobson et al. (2013) estimated that between 616,000 and 2.09 million nests (of many species) are lost annually as a result of industrial forest harvesting.
    - Forest harvest regimes that approximate processes such as storms, fire, and insect damage that naturally modify habitat may be appropriate habitat for breeding Canada Warbler. Canada Warblers were relatively abundant at sites 5-20 years post-harvest (partial cuts, shelterwood cuts, and clearcuts), when some trees were left unharvested in the overstory and sites had relatively dense understory.
- Reduced availability of insect prey. Causes for reduced availability of insect prey are the loss of insect-producing habitats, prey-breeding temporal mismatch, habitat acidification and pesticides.
- Land conversion to agricultural uses.
- Overbrowsing. Deer browsing can radically alter the shrub strata used by Canada Warbler for nesting and foraging by decreasing shrub cover and diversity, and modifying vegetation dynamics. This threat would be most prominent in northeastern United States and south-eastern Canada where White-tailed Deer are particularly abundant.
- Collisions with anthropogenic structures and vehicles.

Current Management

- There are multiple legislative and voluntary means available to protect Canada Warblers and their habitat in Canada. General prohibitions under the Migratory Birds Convention Act (1994) and its regulations protect Canada Warbler nests and eggs anywhere they are found in Canada, regardless of land ownership.
- A recovery planning for the Canada Warbler is in place through the Recovery Strategy report.
    - However, numerous aspects of its recovery needs and limitations are to be investigated. While some research has clarified the habitat needs and limiting factors of Canada Warbler since the status report was written in 2008, most of this research was conducted at a few

	study sites in eastern United States (Vermont and New Hampshire) (Reitsma et al. 2010). Research should be extended to the Canadian portion of the bird's breeding range, with particular emphasis on the issues that relate to the following: 1) determining the relative importance of the suggested threats, 2) determine habitat features that maximize abundance and reproductive success, and 3) determine whether data on abundance are a valid measure of habitat quality. ▪ The Forest Management Manual for New Brunswick Crown Land, 2014 Interim Manual and the Watercourse, and Wetland Alteration Technical Guidelines provides guidelines that can meet to some extent critical aspects to be preserved for the Canada Warbler. ▪ AV Group Nackawic do not have a species specific management plan/approach in-place.
	Decision The assessment concluded that the Canada Warbler is **considered as possible HCV**. ▪ Rationale: o Species is likely to occurs within the Freehold. o Habitat and needs of this species are likely to be compromised by forestry activities in New Brunswick.
	Sources ▪ Environment Canada. 2016. Recovery Strategy for the Canada Warbler (Cardellina canadensis) in Canada. Species at Risk Act Recovery Strategy Series. Environment Canada, Ottawa. vii + 56 pp. ▪ Westwood, A., C. Harding, L. Reitsma, and D. Lambert. 2017. Guidelines for Managing Canada Warbler Habitat in the Atlantic Northern Forest of Canada. High Branch Conservation Services. Hartland, VT. ▪ Government of New Brunswick. New Brunswick Species At Risk Public Registry. (2020). At <http://www1.gnb.ca/0078/SpeciesAtRisk/search-e.asp>
Chaetura pelagica Chimney Swift Threatened	**Status Justification** ▪ Categorized as Vulnerable on the 2018 IUCN Red List. This species past from Near Threis classified as Vulnerable as survey data has demonstrated a rapid population decline due to loss of nesting habitat. ▪ Chimney Swift is currently listed as Threatened in Canada under the Species at Risk Act (2002) and is protected under the Migratory Birds Convention Act (1994). The species is listed as Threatened under New Brunswick's Species at Risk Act.
	Habitat ▪ Chimney Swift requires a vertical cavity for nesting and roosting, with an interior surface that is porous but stable, and to which swifts can cling and attach their nests. ▪ Prior to European settlement in the late 17th and 18th centuries, Chimney Swift mainly nested and roosted inside large hollow trees (living or dead) and occasionally on cave walls and in rocky crevices. While Chimney Swift is now mostly associated with urban and rural habitat where chimneys are available, some still use hollow trees and tree cavities. It has recently been observed using deciduous and coniferous old forest habitat in Ontario, Québec, and the Maritimes.
	Threats to Species and Habitat ▪ In recent times, the number of available chimneys has decreased as a result of the demolition of old buildings, the capping of old chimneys and through chimney sweeps removing nests from chimneys. ▪ Salafsky et al. (2008). Made a Classification of Threats which has been adopted from IUCN-CMP. o Among this classification, the impact calculated for the modification of broad-scale ecosystem was high. Broad-scale ecosystem modifications in many parts of breeding, migration and wintering areas due to a range of causes, including the use of pesticides and

	conversion of wetlands, leads to ongoing changes in insect abundance and community composition with the potential for marked decreases in populations of aerial insects. This likely results in reduced food availability for Chimney Swift at key times of the year, with impacts on survival of individuals, although the lack of data makes it difficult to quantify this threat (hence the wide range in Severity). ○ Also, fragmentation and loss of mature and old growth forest through logging, including removal of dead, hollow trees for human safety, with loss of potential natural nest-sites in large, hollow (primarily deciduous) trees. It is unknown whether nest-site availability in forested areas is locally limiting. As most current logging practices do not allow for the retention of old trees (snags), except in those provinces where some trees with woodpecker cavities or tree rot are retained, wood harvesting is unlikely to have an increased effect in the next 10-year period. Overall, the scope for this threat was assessed as small and severity as slight, because this is not a new threat. ▪ Chimney Swift may experience significant mortality if hurricanes cross migratory paths; this could become a more important source of population loss if the frequency of these storms increase in the future as some climate models suggest.
	Current Management ▪ The environment in which the Chimney Swift lives makes it difficult to link it with the concept of habitat protection as usually defined. A large proportion of nesting sites are not protected, because they are chimneys on private buildings. There are less than 10 known roosting sites in the Maritimes and one of these is in Fredericton, NB and is under protective care of local volunteers. ▪ There are probably few nesting sites in forests, since snags, hollow and sick trees are usually eliminated during harvest. In the Maritimes, only 1 to 5% of the forest cover is presently old growth. New Brunswick aims at conserving and maintaining old growth conditions on 19% of the crown land. ▪ AV Group Nackawic do not have a species-specific management plan/approach in-place. Snags and dead trees are maintained standing when they do not compromise the health and safety of forest workers.
	Decision The assessment concluded that the Chimney Swift is **considered as possible HCV**. ▪ Rationale: ○ Species is likely to occurs within the Freehold. ○ Habitat and needs of this species are likely to be compromised by forestry activities in New Brunswick.
	Sources ▪ COSEWIC. 2018. COSEWIC assessment and status report on the Chimney Swift Chaetura pelagica in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xii + 63 pp. ▪ COSEWIC 2007. COSEWIC assessment and status report on the Chimney Swift Chaetura pelagica in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 49 pp.
Chordeiles minor Common Nighthawk Threatened	**Status Justification** ▪ Common Nighthawk and its nests are protected under the Migratory Birds Convention Act, 1994, and the species has been listed as Threatened under Schedule 1 of the Species at Risk Act since 2007. The species is listed as Threatened in the Maritimes. ▪ NatureServe ranked the species as Apparently Secure (N4B) in Canada. However, it is considered as Critically Imperilled (S1), Imperilled (S2), or Vulnerable (S3) in nine of 13 provinces and territories in which it occurs. It is considered Vulnerable in New Brunswick.
	Habitat

	▪ Microhabitat requirements for Common Nighthawk nesting are more specific and better understood. Nests are typically in open sites with dry, well-drained substrates that will not overheat and that have shade nearby for young to shelter from the sun and predators. Nest sites include forest clearings, bare patches in grassland, gravel pits, outcrops, road or rail sides, and, rarely, fence posts. ▪ Common Nighthawk appears to be an opportunistic generalist in its choice of foraging habitats, often aggregating in areas that attract concentrations of flying insects, such as waterways and lighted areas. ▪ In boreal regions, where a large proportion of the Canadian population breeds, outcrops and post-burn habitats may provide important nesting areas. In urban environments, which comprise a relatively small portion of their Canadian range, nighthawks nest almost exclusively on roofs covered with pea gravel that have a source of shade, such as a parapet.
	Threats to Species and Habitat ▪ Widespread threats that may have an important impact include reduced abundance of aerial insects due to effects of agricultural and other pesticides, changes in precipitation and hydrological regimes, changes in temperature regimes, and increasing frequency of severe or extreme weather events. Several other threats have been proposed, but appear to be less severe or affect only a small proportion of the population. ▪ Direct evidence that agricultural, forestry, and other (e.g., mosquito control) pesticides affect Common Nighthawk is lacking, but individuals that breed in Canada likely migrate through and winter in agricultural areas where such pesticides are used. The harmful effects of chemical insecticides have led to the increased use of biological insecticides. Currently, insecticides used for forestry operations in Canada are mainly biological (Bacillus thuringiensis var. kurstaki - Btk) and target larval Lepidoptera such as Jack Pine Budworm (Choristoneura pinus) and Spruce Budworm (C. fumiferana).
	Current Management ▪ A national recovery strategy has been developed to address key threats, close knowledge gaps and identify critical habitat. ▪ In Canadian National Parks where the species occurs (including at least 20 in which it breeds), the birds, their nests, and their habitats are protected under the National Parks Act. ▪ Forestry and silviculture practises and initiatives in areas across the country attempt to preserve habitat features thought to be important for Common Nighthawk and/or identify occupied habitat. ▪ Common Nighthawk sightings are opportunistically collected as part of the Maritimes SwiftWatch.
	Decision The assessment concluded that the Common Nighthawk is **considered as possible HCV**. ▪ Rationale: o Species is likely to occurs within the Freehold. o The Maritimes Breeding Bird Atlas states that the probability of observing the species declined throughout the region from 1986-1990 to 2006-2010, also without a measure of overall magnitude or reliability. o Habitat and needs of this species are not likely to be directly compromised by the forestry activities of the Organization, but could by those implemented by the NB ERD.
	Sources ▪ COSEWIC. 2018. COSEWIC assessment and status report on the Common Nighthawk (Chordeiles minor) in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xi + 50 pp. (Species at Risk Public Registry). ▪ Environment Canada. 2016. Recovery Strategy for the Common Nighthawk (Chordeiles minor) in Canada. Species at Risk Act Recovery Strategy Series. Environment Canada, Ottawa. vii + 49 pp.

Sturnella magna Eastern Meadowlark Threatened	**Status Justification** ▪ The Eastern Meadowlark has seen major changes in its population size and breeding range since European settlement. Most of its native prairie habitat had fallen to the plough by the end of the 19th century. Since the mid 20th century, the amount and quality of surrogate grasslands across its range have declined. Although the species' population is still relatively large, it has been undergoing persistent range wide declines. These declines are believed to be driven mostly by ongoing loss and degradation of grassland habitat on both the breeding and wintering grounds, coupled with reduced reproductive success resulting from some agricultural practices. ▪ In Canada, the Eastern Meadowlark is presently considered secure and common (N5). It is considered imperiled (S2) in New Brunswick and critically imperiled (S1) in Nova Scotia (NatureServe 2009). The species is currently not tracked by biodiversity information centres in the Maritimes.
	Habitat ▪ The Eastern Meadowlark is most common in native grasslands, pastures and savannahs. It also uses a wide variety of other anthropogenic grassland habitats, including hayfields, weedy meadows, young orchards, golf courses, restored surface mines, grassy roadside verges, young oak plantations, grain fields, herbaceous fencerows, and grassy airfields. ▪ Generally, optimal habitat contains moderately tall (25 to 50 cm) grass with abundant litter cover, a high proportion of grass, moderate to high forb density, low shrub and woody vegetation cover (<5%; >35% is too dense) and low percent cover of bare ground. ▪ In New Brunswick, it breeds locally in the main agricultural areas of the southern and western parts of the province, but it also appears sporadically in the northeast. Less than 15% of the Canadian population breed in the Maritimes
	Threats to Species and Habitat ▪ Habitat loss on the breeding grounds (and probably also on the wintering grounds) caused by conversion of forage crops to intensive grain crops and other row crops, reforestation of abandoned farmlands, and urbanization ▪ Intensification and modernization of agricultural techniques promoting earlier and more frequent haying during the nesting season, causing high rates of nest failure ▪ High and potentially increasing rates of nest depredation ▪ Mortality from pesticide use on the breeding and wintering grounds ▪ Overgrazing by livestock ▪ Brown-headed Cowbird brood parasitism
	Current Management ▪ AV Group Nackawic do not have a species specific management plan in-place.
	Decision The assessment concluded that the Eastern Meadowlark is **not considered as HCV**. ▪ Rationale: ○ It is not likely to have occurrences of this species within the Freehold. ○ Habitat and needs of this species are not likely to be compromised by the forestry activities of the Organization.
	Sources ▪ COSEWIC. 2011. COSEWIC assessment and status report on the Eastern Meadowlark Sturnella magna in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. x + 40 pp.
Numenius borealis	**Status Justification**

Eskimo Curlew Endangered	▪ Formerly abundant, the population collapsed in the late 1800s, primarily owing to uncontrolled market hunting and dramatic losses in the amount and quality of spring stopover habitat (native grasslands). The population has never recovered, and there have been no confirmed breeding records for over 100 years, nor any confirmed records of birds (photographs/specimens) since 1963. As such, less than 50 years have elapsed since the last confirmed record. However, there are some recent sight records that suggest the possibility that a very small population (fewer than 50 mature individuals) may still persist in remote arctic landscapes. ▪ Designated Endangered in April 1978. Status re-examined and confirmed Endangered in May 2000 and November 2009.
	Habitat ▪ This species of shorebird with 100% of its known breeding range in Arctic Canada. ▪ COSEWIC Range for the Eskimo Curlew is considered Yukon, Northwest Territories, Nunavut, Alberta, Saskatchewan, Manitoba, Ontario, Quebec, New Brunswick, Prince Edward Island, Nova Scotia, Newfoundland and Labrador.
	Threats to Species and Habitat ▪ Eskimo Curlews were hunted extensively because they were considered a delicacy, traveled in large dense flocks, were unafraid of humans, and had the habit of circling back within guns range when some members of the flock were shot. These characteristics made them particularly easy to harvest. ▪ The role of habitat loss or of other possible limiting factors cannot be assessed, but habitat loss and alteration (e.g., conversion of grasslands to croplands) at staging sites in Canada and the United States and in wintering areas in South America may have contributed to the species' decline.
	Current Management ▪ AV Group Nackawic do not have a species specific management plan in-place. ▪ The Eskimo Curlew is protected by the federal Migratory Birds Convention Act. Under this Act, it is prohibited to kill, harm, or collect adults, young, and eggs. It is also protected by the Ontario, Manitoba, and Newfoundland and Labrador Endangered Species Acts and the Wildlife Acts in Alberta, Saskatchewan, and British Columbia. Historic and potentially suitable breeding habitat for this species in Canada is protected in the Anderson River Migratory Bird Sanctuary and Kendall Island Bird Sanctuary in the Northwest Territories.
	Decision The assessment concluded that the Eskimo Curlew is **not considered as HCV**. ▪ Rationale: ○ It is not likely to have occurrences of this species within the Freehold.
	Sources ▪ COSEWIC. 2009. COSEWIC assessment and status report on the Eskimo Curlew Numenius borealis in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 32 pp. (www.sararegistry.gc.ca/status/status_e.cfm).
Histrionicus histrionicus Harlequin Duck Eastern population Endangered	**Status Justification** ▪ Though increases have been recorded in southern parts of its breeding range, the population size of this sea duck remains relatively small. Its tendency to congregate in large groups when moulting and on its marine wintering areas makes it susceptible to catastrophic events such as oil spills. Such threats are substantial and are likely increasing, and are of particular significance for populations of long-lived species such as this sea duck, which can be slow to recover. Its population also appears to rely on continued management efforts, particularly those involving restrictions on hunting. ▪ Little information is available on the numbers of Harlequin Ducks from the GWP that breed in Canada, but a crude population estimate suggests that it consists of about 4600 mature individuals.

- The eastern population of the Harlequin Duck is listed as a species of 'Special Concern' in Canada under the Species at Risk Act. Under provincial legislation, it is 'Endangered' in New Brunswick and Nova Scotia.

Habitat

- During the breeding season, Harlequin Ducks occupy clear, fast-flowing rivers and streams. Their wintering habitat is rugged, outer-marine coastline.
- Its occurrence extend to Nunavut, Quebec, New Brunswick, Nova Scotia, Newfoundland and Labrador.
    - In New Brunswick, Harlequin Ducks breeding on the Gaspé Peninsula of Québec (Brodeur et al. 2008; Savard et al. 2008), extending southward into northern of the province. The Atlantic and Bay of Fundy coasts of Nova Scotia and New Brunswick also regularly have Harlequin Ducks in winter.

Threats to Species and Habitat

- Hydroelectric developments, forestry practices, and mining threaten the suitability of Harlequin Duck breeding habitat. However, the extent of these changes has not been quantified and no trends are available.
- The Gulf Stream may be extending farther north along the eastern seaboard in recent decades, affecting the quality of colder coastal habitats preferred by Harlequin Ducks.
- Forestry practices can impinge on the breeding success of Harlequin Ducks.
    - Freeman and Goudie (1998) reported higher breeding densities of Harlequin Ducks in unharvested sections of streams and rivers than in harvested areas. Logging activities not only remove suitable riparian breeding habitat, but increased logging activity in upstream areas can increase siltation, which negatively impacts invertebrate populations. Female Harlequin Ducks may abandon such areas.
    - Best management practices can reduce impacts of forestry; in British Columbia, 100 m no-cut buffers are maintained along streams supporting breeding Harlequin Ducks. In Atlantic Canada, however, provincial regulations for adequate width of vegetative buffering of streams against forestry operations are not considered to be sufficient (Soulliere and Thomas 2009).
    - Southern breeding areas of the Eastern North American Wintering Population are more heavily impacted by industrial forestry practices than those located farther north.
- Other habitat trends:
    - Catastrophic oil spills and chronic oiling
    - Industrial forestry and mining
    - Incidental take from hunting (includes subsistence hunting)
    - Climate change

Current Management

- AV Group Nackawic do not have a species specific management plan in-place.
- A management plan is in place for eastern Canada, and a hunting ban is in effect for most regions. Habitat protection for Harlequin Ducks is not extensive on either its wintering or breeding grounds.

Decision

The assessment concluded that the Harlequin Duck is **not considered as HCV**.

- Rationale:
    - Known occurrences of this species are outside of the Freehold.

Sources

	▪ COSEWIC. 2013. COSEWIC assessment and status report on the Harlequin Duck Histrionicus histrionicus Eastern populationin Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. ix + 38 pp. (Species at Risk Public Registry website). ▪ Soulliere, C.E. and P.W. Thomas. 2009. Harlequin Duck Threat Assessment, Eastern Population. Canadian Wildlife Service Technical Report Series No. 491. St. John's, NL. ▪ Thomas, P.W. and M. Robert. 2001. COSEWIC assessment and update status report on the Harlequin Duck Histrionicus histrionicus Eastern populationin Canada, in COSEWIC assessment and update status report on the Harlequin Duck Histrionicus histrionicus Eastern populationin Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. 1-87 pp.
Ixobrychus exilis Least Bittern Threatened	**Status Justification** ▪ Information on the population size and exact distribution of this secretive species is somewhat limited. Nevertheless, the best available evidence indicates that the population is small (about 3000 individuals) and declining (> 30% in the last 10 years), largely owing to the loss and degradation of high-quality marsh habitats across its range. ▪ Designated Special Concern by COSEWIC in April 1988. Status re-examined and confirmed in April 1999. Status re-examined and designated Threatened in November 2001 and in April 2009. ▪ Wild Species Canada (2015) designated it as Vulnerable.
	Habitat ▪ This diminutive member of the heron family has a preference for nesting near pools of open water in relatively large marshes that are dominated by cattail and other robust emergent plants. Its breeding range extends from southeastern Canada through much of the eastern U.S. ▪ The Least Bittern breeds strictly in marshes dominated by emergent vegetation surrounded by areas of open water. Most breeding grounds in Canada are dominated by cattails, but breeding also occurs in areas with other robust emergent plants and in shrubby swamps. It breeds in freshwater and brackish marshes with tall emergent plants interspersed with open water. ▪ The presence of stands of dense vegetation is essential for nesting because the nests of Least Bittern sit on platforms of stiff stems. ▪ Needs for wintering habitat are less specific, and appear to be met by a wide variety of wetlands—not only emergent marshes like those used for breeding, but also brackish and saline swamps. Habitat use during migration is poorly known, but presumably is similar to breeding and wintering habitat.
	Threats to Species and Habitat ▪ Habitat loss and degradation is by far the greatest threat to the species. Historically, habitat loss consisted of wholesale destruction of marshes, mainly for agriculture.
	Current Management ▪ AV Group Nackawic do not have a species specific management plan in-place. ▪ The Least Bittern occurs in several national parks, where it is protected under the Canada National Parks Act. The species is also protected under the Migratory Birds Convention Act, 1994, which prohibits harming birds, their nests and eggs. ▪ Progress in Recovery A Least Bittern Recovery Team has been in place in Canada since 2004. The team has prepared a Draft Recovery Strategy for the Least Bittern. Presently the federal government is working in cooperation with the provincial governments and non-government organizations within the Least Bittern range to ensure the conservation and protection of known Least Bittern breeding locations. ▪ The first year of field surveys for the Maritime Breeding Bird Atlas was completed in 2006 with call-broadcast methods being used to increase the detectibility of all marshbirds, including the Least Bittern. Recovery Activities Stewardship activities were initiated in numerous locations to augment

	public awareness on the status of the Least Bittern and to implement wetland conservation actions. Following the completion of a recovery strategy in 2007, action plans will be developed to implement recovery activities highlighted in the strategy.
	Decision The assessment concluded that the Least Bittern is **not considered as HCV**. ▪ Rationale: o It is not likely to have occurrences of this species within the Freehold. o Habitat and needs of this species are not likely to be compromised by the forestry activities of the Organization.
	Sources ▪ COSEWIC. 2009. COSEWIC assessment and update status report on the Least Bittern Ixobrychus exilis in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vi + 36 pp. (www.sararegistry.gc.ca/status/status_e.cfm) ▪ Maritimes Breeding Bird Atlas - Atlas des oiseaux nicheurs des Maritimes (mba-aom.ca)
Contopus cooperi Olive-sided Flycatcher Threatened	**Status Justification** ▪ The Canadian population of this widespread forest songbird has experienced a substantial long-term decline, although the rate of decrease has slowed over the past decade. Concerns for the species remain, as most of these threats are continuing, and those related to climate change may increase. ▪ Olive-sided Flycatcher is classified as G4 (Apparently Secure) globally and N3 (Vulnerable) in Canada by NatureServe. All regional rankings have changed to be less secure since the last COSEWIC assessment in 2007. The IUCN Red List classified this species as Near Threatened in 2012 and again in 2016. Olive-sided Flycatcher is protected in Canada by the Species at Risk Act (2002), where it is listed as Threatened under Schedule 1. It is also listed on provincial species at risk legislation in New Brunswick, Nova Scotia, and Newfoundland and Labrador.
	Habitat ▪ Olive-sided Flycatcher is most often associated with edges of coniferous or mixed forests with tall trees or snags for perching, alongside open areas, or in burned forest with standing trees and snags. In natural conditions, these habitats may include open to semi-open mature forest stands, as well as mature stands with edges near wet areas (such as rivers, muskeg, bogs or swamps), burned forest, openings created by insect outbreaks, barrens, or other gaps. The species also uses forest stands adjacent to human-created openings (such as clearcuts, thinned stands, and prescribed burns). There is some limited evidence that birds nesting in and near harvested habitats experience lower breeding success than those nesting adjacent to natural (e.g., burned) openings. In the east, it is most frequently found near wetland areas or in recent burns.
	Threats to Species and Habitat ▪ Loss of wintering habitat in northern South America is likely the greatest threat facing this aerial insectivore, but the species may also be affected by changes on the breeding grounds such as the effects of altered fire regimes and changing climates on nesting habitat quality, and reductions in the abundance and availability of aerial insect prey. ▪ On the breeding grounds, this occurs through forest harvesting, anthropogenic disturbance such as development and service corridors, and changes in fire regimes associated with climate change and direct human intervention (fire suppression), all of which may reduce habitat quality and affect nest success. ▪ On the breeding grounds (e.g. Canada), the impacts of logging may vary regionally and with type of harvest used. In some regions and under some cutting types, Olive-sided Flycatchers are positively associated with stand-level disturbances, which include forest harvesting where edge or some mature trees remain (Altman and Sallabanks 2012). One study suggest that such habitats are ecological traps for this species (Robertson and Hutto

	2007). Effects of harvesting on reproductive success are overall unknown. More information is needed regarding nest success under varying forestry practices.
	Current Management ▪ AV Group Nackawic do not have a species specific management plan in-place. ▪ Olive-sided Flycatcher (and its nest) is protected in Canada under the Migratory Birds Convention Act 1994. It also receives protection through the Species at Risk Act under which it is listed on Schedule 1 as Threatened. As such, there are existing federal prohibitions from capturing, harming, killing, or collecting individuals of this species or its residence. Critical habitat has not yet been identified for protection. ▪ A federal Recovery Strategy exists for this species, which sets out a short-term population objective of halting the national decline by 2025. The long-term objective is to ensure a positive 10-year population trend after 2025. ▪ This species is listed in a number of Bird Conservation Region Strategies. It is also included in the multi-species action plan for 17 national parks, national park reserves, and national historic sites.
	Decision The assessment concluded that the Olive-sided Flycatcher is **considered as possible HCV**. ▪ Rationale: ○ According to the Maritimes Breeding Bird Atlas, there is possible and probable breeding evidence within the DFA. ○ Habitat and needs of this species are likely to be compromised by the forestry activities of the Organization.
	Sources ▪ Altman, B., and R. Sallabanks. 2012. Olive-sided Flycatcher (Contopus cooperi). In A. Poole (ed.). The Birds of North America Online, Cornell Lab of Ornithology, Ithaca, New York. ▪ COSEWIC. 2018. COSEWIC assessment and status report on the Olive-sided Flycatcher Contopus cooperi in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. ix + 52 pp. (Species at Risk Public Registry). ▪ Environment Canada. 2016. Recovery Strategy for Olive-sided Flycatcher (Contopus cooperi) in Canada. Environment Canada, Ottawa, Ontario. vii + 52. ▪ Maritimes Breeding Bird Atlas - Atlas des oiseaux nicheurs des Maritimes (mba-aom.ca) ▪ Robertson, B.A., J.J. Fontaine, and E. Loomis. 2009. Seasonal Patterns of Song Structure Variation in a Suboscine Passerine. The Wilson Journal of Ornithology 121: 815-818. ▪ Robertson, B.A., and R.L. Hutto. 2007. Is selectively harvested forest an ecological trap for Olive-sided Flycatchers? Condor 109:109-121
Falco peregrinus anatum/tundrius Peregrine Falcon Endangered	**Status Justification** ▪ Following dramatic declines in the mid 20th century, this species has rebounded significantly over the past few decades, with continued moderate to strong increases in many parts of Canada since the last status report in 2007. The initial recovery was a result of reintroductions across much of southern Canada following the ban of organochlorine pesticides (e.g., DDT). The extent to which populations have recovered relative to historical levels is generally unknown, but the consistent strong growth of the overall population suggests that there are currently no significant threats to the species. They appear to be at levels that are not affecting reproductive success at the population level. Since 1970, national surveys aimed at determining trends of nesting Peregrine Falcon populations have been carried out every five years in Canada. These surveys reveal that the number of anatum and tundrius Peregrine Falcons has considerably increased since 1970, especially from 2000 to 2005. Populations increased by 43% in occupied sites in southern Ontario and by 107% in southern Quebec.

	▪ In Canada, the species is not protected under the Migratory Birds Convention Act, 1994 (S.C. 1994, c. 22). ▪ The Peregrine Falcon in Canada was originally evaluated by COSEWIC as three separate subspecies: anatum subspecies (Endangered in April 1978, Threatened in April 1999 and in May 2000), tundrius subspecies (Threatened in April 1978 and Special Concern in April 1992) and pealei subspecies (Special Concern in April 1978, April 1999 and November 2001). In April 2007, the Peregrine Falcon in Canada was assessed as two separate units: pealei subspecies and anatum/tundrius. Peregrine Falcon anatum/tundrius was designated Special Concern in April 2007. Status re-examined and designated Not at Risk in November 2017.
	Habitat ▪ The Peregrine Falcon is found in various types of habitats, from Arctic tundra to coastal areas and from prairies to urban centres. Increasingly, the ongoing population growth is a function of healthy productivity and, in the case of urban-nesting pairs, exploitation of previously unoccupied habitat. ▪ The natural nesting habitat has not changed significantly since the population crash and is still largely available. It usually nests alone on cliff ledges or crevices, preferably 50 to 200 m in height, but sometimes on the ledges of tall buildings or bridges, always near good foraging areas. Suitable nesting sites are usually dispersed, but can be common locally in some areas.
	Threats to Species and Habitat ▪ Reproductive failure caused by exposure to organochlorine pesticides, in particular DDT, is the main factor for the historic decline of North American Peregrine Falcon populations. Use of these pesticides causes a thinning and subsequent breaking of the egg shells during incubation. Since organochlorine pesticides were banned in Canada and the United States in the early 1970s and in Mexico in 2000, there has been a decrease in the levels of these pesticides in Peregrine Falcon tissues, which has been associated with the increase in reproductive success over the last few years. ▪ The exploration and development of natural resources (e.g., mining, forestry, wind energy development) could have negative impacts by disturbing Peregrine Falcon during nesting, destroying nests or discouraging the species from nesting in a particular area. The effects of disturbances are comparable to some recreational activities.
	Current Management ▪ AV Group Nackawic do not have a species specific management plan in-place. ▪ SARA contains provisions that allow for the protection of certain listed species at risk individuals, their residences as well as their critical habitat. The responsibility for conservation of species at risk is shared by all jurisdictions in Canada. ▪ Some area managers have developed guidelines aimed at reducing recreational activity at certain sites where the risk of disturbing the species during nesting periods is high. Those measures include prohibiting certain recreational activities or requiring a minimum distance from nests. It is the case in New Brunswick. The Forest Management Manual for New Brunswick Crown Land required the applicant to implement three types of buffers around raptor and heron nest sites. The width of the buffers considers the species tolerance to disturbance during nesting and the species status in New Brunswick as identified by DNR.

	Decision
	The assessment concluded that the Peregrine Falcon is **considered as possible HCV**.
	▪ Rationale:
	  ○ According to the Maritimes Breeding Bird Atlas, there is no breeding evidence within the DFA. However, all raptors nest are integrated as a value in the process of Forest Management planification and resulting activities.
	  ○ Habitat and needs of this species are not likely to be compromised by the forestry activities of the Organization considering the forest management regulation in place.

	Sources ▪ COSEWIC. 2017. COSEWIC assessment and status report on the Peregrine Falcon Falco peregrinus (pealei subspecies – Falco peregrinus pealei and anatum/tundrius – Falco peregrinus anatum/tundrius) in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xviii + 108 pp. ▪ Environment and Climate Change Canada. 2017. Management Plan for the Peregrine Falcon anatum/tundrius (Falco peregrinus anatum/tundrius) in Canada. Species at Risk Act Management Plan Series. Environment and Climate Change Canada, Ottawa. iv + 28 pp. ▪ Environment Canada. 2015. Management Plan for the Peregrine Falcon anatum/tundrius (Falco peregrinus anatum/tundrius) in Canada [Proposed]. Species at Risk Act Management Plan Series. Environment Canada, Ottawa. iv + 27 pp. ▪ Maritimes Breeding Bird Atlas - Atlas des oiseaux nicheurs des Maritimes (mba-aom.ca)
Euphagus carolinus Rusty Blackbird Special Concern	**Status Justification** ▪ Rusty Blackbirds have exhibited a significant population decline in the past century. Data from the Christmas Bird Count suggest that between 1966 and 2003, the population declined by approximately 85%, but a review of historical accounts indicates the population was declining even prior to this time period. Range contractions along the southern edge of its breeding range have also been documented. The species is listed as Special Concern on Schedule 1 of the federal Species at Risk Act (SARA). ▪ In New Brunswick, it is listed as a Species of Special Concern under New Brunswick's Species at Risk Act. ▪ Rusty Blackbird is assessed as Vulnerable on the International Union for Conservation of Nature Red List. Table 1 shows the Nature Serve (2014) conservation ranks throughout its Canadian range.
	Habitat ▪ New Brunswick is within the breeding range of this species. Rusty Blackbirds tend to select breeding sites with a combination of freshwater bodies with shallow water and emergent vegetation for foraging that are adjacent to wetlands with conifers or tall shrubs with cover for nesting. ▪ Recent research of Rusty Blackbirds in northern New England found that wetland occupancy was associated wih the presence of puddles (pools of shallow water devoid of fish), > 70% conifers in adjacent uplands, and evidence of beavers. ▪ Rusty Blackbird is found in every province and territory in Canada, and breeds throughout the boreal forest region. It is most abundant in northern portions of boreal forest. ▪ Rusty Blackbird primarily nests in small conifers, specifically spruces. In Canada, nests have also been found in Balsam Fir (Abies balsamea), Eastern White Cedar (Thuja occidentalis), Paper Birch (Betula papyrifera), Balsam Poplar (Populus balsamifera), Red Maple (Acer rubrum), Pin Cherry (Prunus pensylvanica), emergent sedges, cattails, and on the ground on a beaver dam.
	Threats to Species and Habitat ▪ There are many unknowns surrounding the reasons for the decline of Rusty Blackbird in North America. ▪ The conversion of forested wetlands in the southern United States is cited as the most significant factor contributing to past Rusty Blackbird population declines. ▪ Logging was identified as a threat to Rusty Blackbird nest survival, however the extent of this threat is still not clear. Since Rusty Blackbirds are associated with forested wetlands throughout their wintering range, forest clearing can affect wintering habitat availability. However, Twedt and Wilson (2007) found that use of closed-canopy, second-growth bottomland forests by wintering Rusty Blackbirds was enhanced by silvicultural thinning. Nests in stands with no recent harvests were more than twice as likely to fledge young when compared to nests in stands that had been logged within the past 20 years, resulting from increased predation in recently logged areas. In contrast, a study of Rusty Blackbird nest success in Maine and New Hampshire found no difference in success between nests in harvested areas compared to nests in non-harvested areas

	▪ Suitable climates for breeding are projected to move northward and decrease in their availability overtime leading to an 18% decline in potential abundance by 2040, a 37% decline by 2070, and 55% decline by 2100. ▪ The feathers of Rusty Blackbirds breeding in the Acadian forest ecoregion of New England and the Maritimes (Maine, New Hampshire, Vermont, New Brunswick, and Nova Scotia) had mercury concentrations that were 3 to 7 times higher than concentrations observed in the winter regions in the southern US and breeding sites in Alaska. Long-range atmospheric transport and deposition of mercury is a major source to many aquatic habitats in Canada. Bio-available mercury is also mobilized within watersheds by forestry activities, hydroelectric reservoir creation, and various industrial-related activities (Wiener et al. 2003). The increases in MeHg concentrations in forest cleared areas appears to be correlated with the extent of soil disturbance in the area (Porvari et al. 2003).
	Current Management ▪ AV Group Nackawic do not have a species specific management plan in-place. ▪ Under the Species at Risk Act (SARA), the competent Minister(s) must post a recovery strategy on the Species at Risk Public Registry within 1 year of listing a species as endangered on Schedule 1 of SARA and within 2 years of listing a species as extirpated or threatened. A management plan must be posted within 3 years for a species listed as special concern. (Last update September 1, 2019) ▪ A Management Plan for the Rusty Blackbird has been prepared for the Rusty Blackbird. ▪ Rusty Blackbird has been (and continues to be) monitored using various initiatives in Canada and throughout its range. Monitoring initiatives include the North American Breeding Bird Survey (BBS), Christmas Bird Count (CBC), Breeding Bird Atlases (BBA), migrating bird observatories, and nest record schemes. ▪ Numerous conservation measures are ongoing following implementation schedule proposed to meet the broad strategies of the Management Plan for the Rusty Blackbird. Among them, stewardship and threat mitigation consider Rusty Blackbird requirements in management plans for public lands, environmental assessments, and land-use (forestry, mining, agriculture, etc) planning initiatives. These measures intend to address the conversion of wetlands (breeding, migratory, and wintering range), forest clearing, anthropogenic changes in surface hydrology, mercury contamination, wetland acidification, agricultural pesticides, and altered predator and competitor species composition. ▪ Scientists in Environment Canada (Science and Technology Branch and Canadian Wildlife Service) are examining changes in Rusty Blackbird distribution in relation to mercury levels in the Maritimes and Ontario (N. Burgess, pers. comm. 2013).
	Decision The assessment concluded that the Rusty Blackbird is **considered as possible HCV**. ▪ Rationale: o According to the Maritimes Breeding Bird Atlas, there are possible, probable and confirmed breeding evidence within the DFA.
	Sources ▪ COSEWIC. 2017. COSEWIC assessment and status report on the Rusty Blackbird Euphagus carolinus in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xi + 64 pp. ▪ Environment Canada. 2015. Management Plan for the Rusty Blackbird (Euphagus carolinus) in Canada. Species at Risk Act Management Plan Series. Environment Canada, Ottawa. iv + 26 pp. ▪ Porvari, P., M. Verta, J. Munthe, and M. Haapanen. 2003. Forestry practices increase mercury and methyl mercury output from boreal forest catchments. Environmental Science & Technology 37(11): 2389-2393.

	Powell, L. L., T. P. Hodgman, I. J. Fiske, and W. E. Glanz. 2014. Habitat occupancy of Rusty Blackbirds (Euphagus carolinus) breeding in northern New England, USA. The Condor 116(1): 122-133. ▪ Twedt, Daniel & Wilson, R.. (2007). Management of bottomland hardwood forests for birds. ▪ Wiener, J. G., D. P. Krabbenhoft, G. H. Heinz, and A. M. Scheuhammer. 2003. Ecotoxicology of Mercury. Pages 407-461 In D. J. Hoffman, B. A. Rattner, G. A. Burton, and J. Cairns (eds.). Handbook of Ecotoxicology, 2nd edition. CRC Press. Boca Raton, Florida.
Asio flammeus Short-eared Owl Special Concern	**Status Justification** ▪ This owl has suffered a continuing population decline over the past 40 years, including a loss of 23% in the last decade alone. This species nearly meets the criteria for Threatened status. ▪ The species was designated as Special Concern by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) in 1994 and 2008 and has been listed as such in Schedule 1 of the Species at Risk Act (SARA) since 2012. ▪ NatureServe (2015) considers the global population of the Short-eared Owl to be Secure (G5; assessment as of November 2014). At the New Brunswick scale, the species is ranked Vulnerable (S3) by NatureServe.
	Habitat ▪ Marshes and grasslands along the coast of New Brunswick are consider as part of the Atlantic provinces areas of interest. ▪ Short-eared Owls occur in a variety of open native habitats, such as grasslands, Arctic tundra, taiga, bogs, marshes, wetlands, coastal barrens, estuaries and grasslands dominated by sand-sage (Artemisia filifolia). They are also found in many types of agricultural habitats (e.g. managed grasslands).
	Threats to Species and Habitat ▪ Habitat loss and degradation on its wintering grounds are most likely the major threat, while continuing habitat loss and degradation on its breeding grounds in southern Canada and pesticide use are secondary threats. Human activities that remove or fragment large expanses of habitat required during the various life cycle stages are considered the primary factor driving declines in Short-eared Owl populations. ▪ In areas where the Short-eared Owl breeds amid crop fields, mowing and harvesting of hay and grains can be a significant source of egg and nestling mortality. ▪ A decrease in the abundance of prey as a result of habitat changes, as well as the collision of adults with vehicles, utility lines and barbed-wire fences, may also contribute to population decline. Although elevated concentrations of pesticides, particularly organochlorines, have been detected in Short-eared Owl eggs, the effects of these contaminants are not yet well known. ▪ Limiting factors influence a species' survival and reproduction, and play a major role in its capacity to reach high population densities or to recover following a decline. Availability of food resources is a limiting factor for the Short-eared Owl. The Meadow Vole, one of its main prey species, undergoes cyclic population fluctuations every 2 to 5 years. Site fidelity in the Short-eared Owl is closely tied to resource abundance. Reduced prey availability may prompt adults to travel distances of over 1,000 km between sites used in consecutive breeding seasons.
	Current Management ▪ AV Group Nackawic do not have a species specific management plan in-place. ▪ Best management practices for Short-Eared Owl will be developed and implemented at Kouchibouguac National Park (NB). ▪ The New Brunswick Ministry of Natural Resources and Energy Development provides direction to protect occupied Short-eared Owl nests within a forestry context through the Forest Management Manual for New Brunswick Crown Land. ▪ In New Brunswick, there is policy development regarding wetlands, zoning and pesticide use.

	Decision The assessment concluded that the Short-eared Owl is not considered as HCV. ▪ Rationale: ○ According to the Maritimes Breeding Bird Atlas, there is no breeding evidence within the DFA. ○ Habitat and needs of this species are not likely to be compromised by the forestry activities of the Organization considering the forest management regulation in place.
	Sources ▪ COSEWIC. 2008. COSEWIC assessment and update status report on the Short-eared Owl Asio flammeus in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vi + 24 pp. ▪ Environment and Climate Change Canada. 2018. Management Plan for the Short-eared Owl (Asio flammeus) in Canada. Species at Risk Act Management Plan Series. Environment and Climate Change Canada, Ottawa. v + 37 pp. ▪ Maritimes Breeding Bird Atlas - Atlas des oiseaux nicheurs des Maritimes (mba-aom.ca) ▪ Parks Canada Agency. 2016. Multi-species Action Plan for Kouchibouguac National Park of Canada and associated National Historic Sites of Canada. Species at Risk Act Action Plan Series. Parks Canada Agency, Ottawa. v + 20 pp.
Caprimulgus vociferus Whip-poor-will Threatened	**Status Justification** ▪ Long-term and short-term declines in the species have been seen, particularly in eastern populations. Local populations have dropped more than 30% over a 10-year period; the decline is most likely linked to other insect-feeding bird species' population declines, due to habitat loss and significant changes to the prey base. ▪ The Whip-poor-will is listed as Threatened under Schedule 1 of Canada's Species At Risk Act. The species is also protected under the Migratory Birds Convention Act. ▪ Status Under SARA:Threatened COSEWIC Assessment as of 2009: Threatened Range: Nova Scotia, New Brunswick, Ontario, Québec, Manitoba and Saskatchewan. ▪ It is listed as Threatened under three provincial Endangered Species Acts such as the New Brunswick's Species at Risk Act (SNB 2012, c. 6). ▪ NatureServe (2014) considers the global populations of the Eastern Whip-poor-will to be Imperiled (S2B).
	Habitat ▪ The species shuns both wide-open spaces and dense forest. Whip-poor-will breeding habitat is not dependent upon species composition, but rather on forest structure, although common tree associations in both summer and winter are pine and oak. ▪ It prefers to nest in semi-open forests or patchy forests with clearings, such as barrens or forests that are regenerating following major disturbances. Other necessary breeding habitat elements are thought to involve ground-level vegetation and woodland size. Individuals will often feed in nearby shrubby pastures or wetlands with perches. ▪ In winter, Whip-poor-wills occupy primarily mixed coniferous-broadleaved forests. ▪ In forested landscapes, the Eastern Whip-poor-will often takes advantage of the open areas created by low-intensity agriculture or forest management for foraging, while relying on adjacent forests for nesting (COSEWIC 2009). Agricultural land abandonment creates early- and mid-successional forests that can, at first, provide suitable habitat for the species, but succession eventually leads to older forest stages, which are not preferred habitats.
	Threats to Species and Habitat

	▪ Habitat loss is thought to be a factor in declines of nightjars, including Whip-poor-wills, although no direct link has been demonstrated between Whip-poor-will population decline and reductions in critical habitat. ▪ The decrease in insect availability due to pesticides, climate change and changes in water or air quality are also possible causes of the decline. ▪ Finally, collisions with vehicles could also constitute a threat. Like most nightjars, Whip-poor-wills commonly sit on gravel roads or road shoulders at night, making them particularly vulnerable to automobile collisions. ▪ To the list of factors contributing to Whip-poor-will declines can be added nest disturbance due to increases in populations of cats, racoons and other potential predators. ▪ Forest harvesting can have short term negative effects on nesting birds by disrupting breeding activities (Hobson et al. 2013). The nests and/or eggs can be inadvertently harmed or disturbed as a result of clearing trees and other vegetation. (e.g. pre-commercial thinning) (Environment Canada 2014b). Forest management can also improve habitat through practices such as clearcut interspersion with mature forests (Tozer et al. 2014), variable density thinning, early thinning and other aspects of partial cutting (Bushman and Therres 1988).

	Current Management
	▪ AV Group Nackawic do not have a species-specific management plan in-place.
	▪ Kouchibouguac National Park do record incidental observations and share with partners. For forest birds, a monitoring program will be initiated in anticipation of aligning with national protocols and contributing to a national database when available.
	▪ Recovery Planning for the Eastern Whip-poor-will is ongoing. Refer to the Recovery Strategy for the Eastern Whip-poor-will (Antrostomus vociferus) in Canada. Among implemented management approaches, there is:
	  ○ Integrate BMPs for Eastern Whip-poor-will with BMPs for other wildlife within a heterogeneous and dynamic mosaic
	  ○ Use management techniques over large land units and/or within an ecosystem approach
	  ○ Restore habitats in some highly modified landscapes to promote the recolonization of portions of the global distribution range

	Decision
	The assessment concluded that the Eastern Whip-poor-will is **considered as possible HCV**.
	▪ Rationale:
	  ○ According to the Maritimes Breeding Bird Atlas, there is possible breeding evidence by the species within the DFA.
	  ○ Habitat and needs of this species are likely to be compromised by the forestry activities of the Organization.

	Sources ▪ Bushman, E.S. and G.D. Therres. 1988. Habitat management guidelines for forest interior breeding birds of coastal Maryland. Maryland Deptartment of Natural Resources. Wildlife Technical Publication 88-1. 50 p. ▪ Environment and Climate Change Canada. 2018. Recovery Strategy for the Eastern Whip-poor-will (Antrostomus vociferus) in Canada. Species at Risk Act Recovery Strategy Series. Environment and Climate Change Canada, Ottawa. vi + 107 pp. ▪ Hobson, K. A., A. G. Wilson, S. L. Van Wilgenburg and E. M. Bayne. 2013. An estimation of nest loss in Canada due to industrial forestry operations. Avian Conservation and Ecology 8(2):5. ▪ Maritimes Breeding Bird Atlas - Atlas des oiseaux nicheurs des Maritimes (mba-aom.ca) ▪ Parks Canada Agency. 2016. Multi-species Action Plan for Kouchibouguac National Park of Canada and associated National Historic Sites of Canada. Species at Risk Act Action Plan Series. Parks Canada Agency, Ottawa. v + 20 pp.

	▪ Wilson, M.D. and B.D. Watts. 2008. Landscape configuration effects on distribution and abundance of Whip-poor-wills. The Wilson Journal of Ornithology 120(4):778-783.
Hylocichla mustelina Wood Thrush Threatened	**Status Justification** ▪ In Canada, this forest-nesting species has shown significant long and short-term declines in population abundance. ▪ The Minister of the Environment forward the COSEWIC assessment of the Wood Thrush ▪ COSEWIC designated it as Threatened in November 2012. ▪ At the global level, the species is considered secure (G5, last assessed in 2000) by NatureServe (2012). The species is considered 'Least concern' according to the IUCN Red List. However, the Wood Thrush is considered a "WatchList" species by the North American Landbird Conservation Plan. The species was also included on Audubon's 2007 WatchList and the State of the Birds (National Audubon Society 2012) identified Wood Thrush as one of the eastern forest birds experiencing "consistent and troubling declines". ▪ In New Brunswick, NatureServe (2012) indicates that this species is imperiled and vulnerable to extirpation. ▪ According to the Maritime Breeding Bird Atlases, the estimated index of area of occupancy (based on 2 km x 2km grid) appears to have decreased between the first and second atlas periods, throughout New Brunswick.
	Habitat ▪ In Canada, the Wood Thrush nests mainly in second-growth and mature deciduous and mixed forests, with saplings and well-developed understory layers. This species prefers large forest mosaics, but may also nest in small forest fragments. Wintering habitat is characterized primarily by undisturbed to moderately disturbed wet primary lowland forests. ▪ During the breeding season, the Wood Thrush is found in moist, deciduous hardwood or mixed stands, often previously disturbed (e.g., small-scale logging and ice storm damage), with a dense deciduous undergrowth and with tall trees for singing perches. ▪ Peck and James (1987) found that in Ontario, the Wood Thrush prefers second-growth over mature forests. In southern Québec, the species is mainly associated with mature Sugar Maple (Acer saccharum)-dominated stands (Gauthier and Aubry 1995) but also is found in American Beech (Fagus grandifolia) stands of moderate density, where soil conditions are either mesic or xeric. ▪ Wood Thrushes choose habitats based on the structure of the forest. Specifically, this species selects nesting sites with the following characteristics: lower elevations with trees >16 m in height, a closed canopy cover (>70 %), a high variety of deciduous tree species, moderate subcanopy and shrub density, shade, fairly open forest floor, moist soil, and decaying leaf litter (Evans et al. 2011).
	Threats to Species and Habitat ▪ Several threats are currently known to affect the Wood Thrush. On the breeding grounds the main threats include habitat degradation and fragmentation due to development and over-browsing by White-tailed Deer. High rates of nest predation and Brown-headed Cowbird nest parasitism associated with habitat fragmentation also threaten the Wood Thrush. On the wintering grounds the main threats are habitat loss and degradation ▪ Like some natural perturbations, high-grade logging will first alter the Wood Thrush habitat for a few years, but then will likely create suitable habitat when the understory and saplings regenerate. 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; Gram et al. 2003). In southern Ontario, Holmes et al. (2004) reported that Wood Thrushes were more abundant in heavily cut woodlots than in standard cut woodlots or uncut woodlots.
	Current Management ▪ AV Group Nackawic do not have a species specific management plan in-place.

	▪ Kouchibouguac National Park do record incidental observations and share with partners. For forest birds, a monitoring program will be initiated in anticipation of aligning with national protocols and contributing to a national database when available. ▪ Little information is available on the quantity of available habitat and the level of habitat protection on public lands in eastern Canada, but it undoubtedly constitutes a relatively small portion of the area occupied by this species (ca. 25 %). Relatively small portions of the deciduous and mixed forests in southeastern Canada located on public lands are protected in national and provincial parks, migratory bird sanctuaries and national wildlife areas. ▪ According to the Parks Canada's Biotics database, the Wood Thrush is present in 10 national parks (confirmed breeding in 3 parks only) and in one national historic site managed by Parks Canada (Parks Canada 2011). Moreover, the species is reported on 13 Department of National Defence establishments in eastern Canada where it is believed to be a common breeder.
	Decision The assessment concluded that the Eastern Wood Thrush is **considered as possible HCV**. ▪ Rationale: o According to the Maritimes Breeding Bird Atlas, there is possible breeding evidence by the species within the DFA. o Habitat and needs of this species are not likely to be heavily compromised by the forestry activities of the Organization.
	Sources ▪ COSEWIC. 2012. COSEWIC assessment and status report on the Wood Thrush Hylocichla mustelina in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. ix + 46 pp. ▪ Evans, M., E. Gow, R. R. Roth, M. S. Johnson and T. J. Underwood. 2011. Wood Thrush (Hylocichla mustelina), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: http://bna.birds.cornell.edu/bna/species/246 ▪ Gauthier, J. and Y. Aubry (sous la direction de). 1995. Les oiseaux nicheurs du Québec: Atlas des oiseaux nicheurs du Québec méridional. Association québécoise des groupes d'ornithologues, Société québécoise de protection des oiseaux, Service Canadien de la faune, Environnement Canada, Montréal, xviii + 1295 p. ▪ Gram, W. K., P. A. Porneluzi, R. L. Clawson, J. Faaborg, and S. C. Richter. 2003. Effects of experimental forest management on density and nesting success of bird species in Missouri Ozark forests. Conservation Biology 17:1324–1337. ▪ Holmes, S.B. D. M. Burke, K. A. Elliott, M. D. Cadman, and L. Friesen. 2004. Partial cutting of woodlots in an agriculture dominated landscape: effects on forest bird communities. Canadian Journal of Forest Resources 34: 2467-2476. ▪ Maritimes Breeding Bird Atlas - Atlas des oiseaux nicheurs des Maritimes (mba-aom.ca) ▪ Parks Canada Agency. 2016. Multi-species Action Plan for Kouchibouguac National Park of Canada and associated National Historic Sites of Canada. Species at Risk Act Action Plan Series. Parks Canada Agency, Ottawa. v + 20 pp. ▪ Parks Canada. 2011. Biotics Web Explorer. ▪ Peck, G.K. and R.D. James. 1987. Breeding Birds of Ontario: nidiology and distribution. Vol. 2. Royal Ontario Museum, Toronto.
Coturnicops noveboracensis Yellow Rail Special Concern	**Status Justification** ▪ The species is close to meeting some criteria for Threatened status because of its relatively small population size, compressed wintering range, ongoing threats to breeding and wintering wetland habitats, and evidence for local declines in several parts of its breeding range. ▪ COSEWIC designated it as Special Concern in April 1999. Status re-examined and confirmed in November 2001 and 2009.
	Habitat

- Yellow Rails inhabit shallow wetlands and other wet areas with grass-like vegetation.They breed in wetlands such as damp hay fields or meadows, floodplains, bogs, upper levels of estuaries, salt marshes (COSEWIC 2009), shallow prairie wetlands, and wet montane meadows. These wetlands are generally dominated by short, fine-stemmed herbaceous vegetation, especially sedges (Carex spp.), as well as other graminoid vegetation of the families Cyperaceae, Poaceae, and Juncaceae. Vegetation structure (e.g. short, grass-like, and dense) is likely more important than its taxon. Breeding habitats may have up to 50 cm of standing water, but typically nesting sites are less than 15 cm deep.
- Even though the habitat seems very good for Yellow Rails, breeding has never been confirmed there. Water levels in the St. John River may be too high for the species during the breeding season and it is possible that the birds observed at Grand Lake Meadows have been molting birds that bred elsewhere, such as in Québec or in the interior of New Brunswick. Efforts are currently underway to determine whether the species breeds at Grand Lake Meadows.

Threats to Species and Habitat

- The main threat to Yellow Rail populations is habitat loss from agricultural, commercial, industrial and infrastructure development (COSEWIC 2009).
- Alterations to hydrology, including activities such as damming, draining wetlands, dredging, channelizing, and creation of impoundments, can threaten habitat at all stages of the life cycle, even when they occur away from Yellow Rail sites. In addition, wetland conservation projects that alter natural hydrological conditions often lack the range of habitat conditions needed by rails.
- The short rotation forest biomass, which is increasingly becoming promoted, has been identified as a potential threat. Some land owners are interested in developing this activity in open areas (e.g. high marshes). Plantation of short rotation forest species (e.g. Pussy Willow [Salix discolor]) in Yellow Rail habitat would be detrimental to the species.
- Haying and harvesting crops can disturb or kill adult Yellow Rails, destroy nests, or expose nests to depredation.
- The species' narrow tolerance for shallow water levels likely explains why its abundance at any given site can vary dramatically from year to year.

Current Management

- AV Group Nackawic do not have a species specific management plan in-place.
- Several marshes important to Yellow Rail have been designated as IBAs. The nearest to New Brunswick (be outside of it) include Île aux Grues, Gaspé Bay, and Barachois-de-Malbaie in Quebec.

Decision

The assessment concluded that the Yellow Rail is **not considered as HCV**.

- Rationale:
    - No occurrences of this species within the Freehold.
        - Erskine (1992) suggested that fewer than 50 pairs breed in New Brunswick. In fact, the only site where the Yellow Rail is known to occur regularly in New Brunswick is Grand Lake Meadows, in the upper estuary of the St. John River, where three to 24 calling males have been heard annually from 1991 to 1996. During that period, the area with Yellow Rails varied from 35 to 131 ha.

Sources

- Environment Canada. 2013. Management Plan for the Yellow Rail (Coturnicops noveboracensis) in Canada. Species at Risk Act Management Plan Series. Environment Canada,Ottawa. iii + 24 pp.
- Erskine, A.J. 1992. Atlas of Breeding Birds of the Maritime Provinces. Nimbus Publishing Ltd. and the Nova Scotia Museum, Halifax, Nova Scotia.
- Species at Risk Public Registry - COSEWIC assessment and status report on the Yellow Rail (Coturnicops noveboracensis) in Canada (sararegistry.gc.ca)

Table 3. New Brunswick species at risk – Fishes.

***Scientific Name* / Common Name Status**	**Risk Assessment and Decision**
Anguilla rostrata American Eel Threatened	**Status Justification** ▪ Designated Special Concern in April 2006 by COSEWIC. Status re-examined and designated Threatened in May 2012.
	Habitat ▪ The American eel can be found on the western side of the Atlantic Ocean. In Canada, it is found in all fresh water, estuaries and coastal marine waters that are accessible to the Atlantic Ocean, from Niagara Falls in the Great Lakes up to the mid- Labrador coast. American eel can be declining in certain locations and be stable elsewhere.
	Threats to Species and Habitat ▪ The survival of American eels is influenced by the following threats: habitat alteration, dams and turbines, fishery harvest, changes to ocean conditions related to climate change, contaminants and parasites.
	Current Management ▪ AV Group Nackawic do not have a species specific management plan/approach in-place. ▪ The Multi-species Action Plan for Kouchibouguac National Park of Canada and associated National Historic Sites of Canada applies to lands and waters occurring within the boundaries of the four sites: Kouchibouguac National Park of Canada (KNP) and other land managed by Parks Canada in the Northern New-Brunswick Field Unit offering adequate habitat for the species targeted in this action plan (Fort Beauséjour – Fort Cumberland National Historic Site of Canada (NHS), Beaubassin – Fort Lawrence NHS, Grand-Pré NHS). The plan meets the requirements for action plans set out in the Species at Risk Act (SARA) (s.47) for species requiring an action plan and that regularly occur in these sites. KNP do record incidental observations and share with partners.
	Decision The assessment concluded that the American Eel is **not considered as HCV**. ▪ Rationale: o It is not likely to have occurrences of this species within the Freehold. o Habitat and needs of this species are not likely to be compromised by the forestry activities of the Organization.
	Sources ▪ American Eel (Anguilla rostrata) - Species search - Species at risk registry (canada.ca) ▪ COSEWIC 2006. COSEWIC assessment and status report on the American eel Anguilla rostrata in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. x + 71 pp. ▪ Parks Canada Agency. 2016. Multi-species Action Plan for Kouchibouguac National Park of Canada and associated National Historic Sites of Canada. Species at Risk Act Action Plan Series. Parks Canada Agency, Ottawa. v + 20 pp.
Salmo salar	**Status Justification**

***Scientific Name* / Common Name Status**	**Risk Assessment and Decision**
Atlantic Salmon Inner Bay of Fundy population Endangered	▪ Designated Endangered in May 2001. Status re-examined and confirmed in April 2006 and November 2010. ▪ This population once bred in 32 rivers tributary to the inner Bay of Fundy, from just east of the Saint John River, to the Gaspereau River in Nova Scotia; however, spawning no longer occurs in most rivers. The population, which is thought to have consisted of about 40,000 individuals earlier in the 20th century, is believed to have been fewer than 200 individuals in 2008. Survival through the marine phase of the species' life history is currently extremely poor, and the continued existence of this population depends on a captive rearing program. There is no likelihood of rescue, as neighbouring regions harbour severely depleted, genetically dissimilar populations. The population has historically suffered from dams that have impeded spawning migrations and flooded spawning and rearing habitats, and other human influences, such as pollution and logging, that have reduced or degraded freshwater habitats. Current threats include extremely poor marine survival related to substantial but incompletely understood changes in marine ecosystems, and negative effects of interbreeding or ecological interactions with escaped domestic salmon from fish farms. The rivers used by this population are close to the largest concentration of salmon farms in Atlantic Canada.
	Habitat ▪ The range of the Inner Bay of Fundy (iBoF) Salmon population includes 50 rivers draining into the inner Bay of Fundy starting with the Mispec River (northeast of the Saint John River) in New Brunswick, around the inner Bay to the Pereaux River (in the Minas Basin northeast of the Annapolis River) in Nova Scotia. ▪ In 2010, 10 rivers in New Brunswick and Nova Scotia were identified as containing fresh water critical habitat for the iBoF Salmon under the Species at Risk Act (SARA): Gaspereau, Stewiacke, Debert, Folly, Great Village, Portapique, Economy, Upper Salmon, Point Wolfe and Big Salmon. Details on this identified critical habitat can be found in Section 2.5 of the recovery strategy.
	Threats to Species and Habitat ▪ Although historical impacts in fresh water may have contributed to the species' decline and current status, a growing body of evidence suggests that the recovery of iBoF Salmon is primarily limited by low marine survival rather than an inability to spawn and live successfully in freshwater rivers and streams. The reason(s) for their low marine-survival rates is/are unknown. The leading marine threats include interactions with farmed and hatchery salmon, changes in prey and predator species and/or their abundances; environmental shifts; and fisheries. ▪ Habitat in spawning rivers is threatened by the effects of agriculture, urbanization, poor forestry practices, mining, road building and other factors related to human activities. Decreased smolt production due to habitat degradation, low pH, and temperature increases have been observed elsewhere, but overall impacts on iBoF Salmon have not been quantified. ▪ The leading freshwater threats include changes in environmental conditions; pollutants, barriers to fish passage; and depressed population phenomena (e.g., abnormal behaviour due to low abundance, inbreeding). Although threats in the ocean are believed to be the main threat facing iBoF Salmon recovery, threats in freshwater may also have an impact.
	Current Management ▪ AV Group Nackawic do not have a species specific management plan/approach in-place. ▪ The NB Department of Natural Resources, the NS Department of Fisheries and Aquaculture and the NS Department of Natural Resources administer their respective provincial natural resource management legislation and also support the federal Fisheries Act. Both provinces have environmental agencies (NS Department of Environment, NB Department of Environment) for delivery of their environmental legislation. Examples of provincial

***Scientific Name* / Common Name Status**	**Risk Assessment and Decision**
	legislation that directly and indirectly afford protection to iBoF Salmon in NB include the Endangered Species Act, Aquaculture Act, Clean Environment Act, Clean Water Act, Ecological Reserves Act, Crown Land and Forests Act, Pesticide Control Act and the Fish and Wildlife Act; and, in Nova Scotia, the Endangered Species Act, Fisheries and Coastal Resources Act, Wildlife Act, Environment Act and Angling Act. ▪ Locally, stakeholder groups, such as the Atlantic Salmon Federation and provincial and watershed conservation organizations, invest considerable time and money towards Atlantic salmon conservation. Aboriginal peoples' natural life management authorities, groups and communities invest significant effort seeking support and involvement in protection, conservation, and recovery activities to help conserve and recover the Atlantic salmon and its habitat. These organizations, authorities, groups and communities have proven to be invaluable and essential to Atlantic salmon protection, conservation and recovery efforts. ▪ Persistence of the populations is currently maintained through a Live Gene Bank (LGB) program which is a pedigree-supported spawning and rearing program designed to minimize the loss of genetic diversity and fitness in the remnant populations. A Recovery Potential Assessment (RPA) for iBoF Salmon was conducted by DFO Science in March 2008 to summarize the current understanding related to the distribution, abundance, trends, extinction risk and current state of iBoF Salmon populations, as well as to provide information on habitat and threats. The success of the Live Gene Bank program in increasing the number of juvenile salmon in iBoF rivers indicates that freshwater habitat quality is sufficient to maintain populations despite ongoing degradation.
	Decision The assessment concluded that the Atlantic Salmon Inner Bay of Fundy population is **not considered as HCV**. ▪ Rationale: o There is no occurrences of this species within the Freehold. o Habitat and needs of this species are not likely to be compromised by the forestry activities of the Organization. o All habitat in inner Bay of Fundy rivers is protected under the Fisheries Act. IBoF Salmon in these rivers will continue to be protected by both the Fisheries Act and SARA. Habitat in FNP rivers not delineated as critical habitat are also offered protection by the Canada National Parks Act and regulated regulations.
	Sources ▪ Department of Fisheries and Oceans Canada. 2010. Recovery Strategy for the Atlantic salmon (Salmo salar), inner Bay of Fundy populations [Final]. In Species at Risk Act Recovery Strategy Series. Ottawa: Fisheries and Oceans Canada. xiii + 58 pp + Appendices. ▪ Atlantic Salmon (Inner Bay of Fundy population) (dfo-mpo.gc.ca) ▪ Atlantic Salmon (Salmo salar), Inner Bay of Fundy population - Species search - Species at risk registry (canada.ca)
Salmo salar Atlantic Salmon Outer Bay of Fundy population Endangered	**Status Justification** ▪ Designated Endangered in November 2010 by COSEWIC. ▪ This population breeds in rivers tributary to the New Brunswick side of the Bay of Fundy, from the U.S. border to the Saint John River. Small (one-sea-winter) and large (multi-sea-winter) fish have both declined over the last 3 generations, approximately 57% and 82%, respectively, for a net decline of all mature individuals of about 64%; moreover, these declines represent continuations of greater declines extending far into the past. There is no likelihood of rescue, as neighbouring regions harbour severely depleted, genetically dissimilar populations. The population has historically suffered

***Scientific Name* / Common Name Status**	**Risk Assessment and Decision**
	from dams that have impeded spawning migrations and flooded spawning and rearing habitats, and other human influences, such as pollution and logging, that have reduced or degraded freshwater habitats. Current threats include poor marine survival related to substantial but incompletely understood changes in marine ecosystems, and negative effects of interbreeding or ecological interactions with escaped domestic salmon from fish farms. The rivers used by this population are close to the largest concentration of salmon farms in Atlantic Canada.
	Habitat ▪ The Atlantic Salmon of the Outer Bay of Fundy (oBoF) DU consists of a grouping of salmon populations that occupy rivers on the New Brunswick side of the Bay of Fundy, from the U.S. border up to and including the Saint John River. ▪ Atlantic Salmon adults spawn in freshwater, generally in the same river in which they were born (natal river). Juveniles from the OBoF designatable unit (DU) usually spend two to four years in freshwater before migrating to the north Atlantic Ocean. Adults usually return to freshwater to spawn after one to three years at sea. Rivers that support Atlantic Salmon are generally clear, cool and well-oxygenated, with gravel, cobble and boulder substrates.
	Threats to Species and Habitat ▪ The Recovery Potential Assessment identified numerous threats to OBoF DU Atlantic Salmon. The threats identified as highest concern in freshwater were, in no particular order, habitat alteration due to hydroelectric dams and illegal fishing. In the estuarine and marine environment, threats of high concern include, in no particular order, shifts in marine conditions, salmon aquaculture, depressed population phenomenon, and uncertainties around the occurrence of disease and parasites. Note that some activities identified may not represent a threat, or may be ranked at a lower severity, after the application of mitigation measures.
	Current Management ▪ AV Group Nackawic do not have a species specific management plan/approach in-place. ▪ Under an agreement with the Province of New Brunswick, DFO is currently providing support for the rearing of oBoF Atlantic Salmon for the Saint John River. The Mactaquac Biodiversity Facility operates this supportive rearing program, which releases fish above the Mactaquac Dam to mitigate losses due to hydroelectric development. DFO also conducts annual parr, smolt, and adult oBoF Atlantic Salmon abundance surveys on two rivers, in co-operation with First Nations and local volunteers and staff of conservation groups and New Brunswick Power. The data from these surveys will be used to help determine the recovery potential of oBoF population. Researchers from DFO, First Nation partners, and conservation groups are also tracking the movements of adult salmon in relation to hydroelectric dams and spawning tributaries. In addition, there are plans in place, through a collaboration of multiple stakeholders, to attempt to restore salmon to the Magaguadavic River by captive-rearing and cross-breeding parr collected from tributaries of the lower Saint John River. Shoreline and habitat restoration projects have been undertaken by partners and stakeholders in multiple rivers within this Designatable Unit.

	Decision
	The assessment concluded that the Atlantic Salmon Outer Bay of Fundy population is **not considered as HCV**.
	▪ Rationale:
	  ○ There is no occurrences of this species within the Freehold.
	  ○ Habitat and needs of this species are not likely to be compromised by the forestry activities of the Organization.

***Scientific Name* / Common Name Status**	**Risk Assessment and Decision**
	○ The Outer Bay of Fundy Atlantic Salmon is managed under the Fisheries Act, via the Atlantic Fisheries Regulations, Maritime Provinces Fishery Regulations, Fishery (General) Regulations, as well as through licenses issued under the Aboriginal Communal Fishing Licence Regulations. All commercial, recreational and Aboriginal Food, Social and Ceremonial fisheries for Outer Bay of Fundy Atlantic Salmon are currently closed. Atlantic Salmon habitat is protected under the new fisheries protection provisions of the Fisheries Act.
	Sources ▪ Response Statement - Atlantic Salmon, Outer Bay of Fundy population (2011) - Document search - Species at risk registry (canada.ca) ▪ Atlantic Salmon (Outer Bay of Fundy Designatable Unit) (dfo-mpo.gc.ca) ▪ Species at Risk Public Registry - Information Summary for the Consultation on Adding the Outer Bay of Fundy Atlantic Salmon to the List of Wildlife Species at Risk under the Species at Risk Act (sararegistry.gc.ca)
Acipenser brevirostrum Shortnose Sturgeon Special Concern	**Status Justification** ▪ Designated Special Concern in April 1980 by COSEWIC. Status re-examined and confirmed in May 2005 and in May 2015. ▪ Shortnose Sturgeon has been classified as Endangered by the Endangered Species Act in the United States since March 1967. The National Marine Fisheries Service generated a Final Recovery Plan for the US Shortnose Sturgeon in 1998. The Shortnose Sturgeon has been listed in Appendix I of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) since 1975. Appendix I of CITES includes those species that are presently threatened with extinction and trade is only authorized in exceptional circumstances. ▪ Although there are no imminent threats toward the species, its limited distribution makes the species vulnerable to becoming Threatened if conditions thought to negatively impact it (variable flow patterns, pollution, bycatch in commercial fisheries, and poaching) are not managed effectively.
	Habitat ▪ Shortnose Sturgeons inhabit large tidal rivers. The juvenile fish remain in riverine environments, while the adults migrate upstream in the spring and downstream in the fall, and also inhabit areas of salt water for periods of the year. Shortnose Sturgeon inhabit deep waters in the winter and shallower waters in the summer. ▪ In the Saint John River, Shortnose Sturgeon are suspected to spawn within a 10 km stretch below the Mactaquac Dam, which is 138 km upstream from the mouth of the Saint John River estuary. One major overwintering site has been confirmed in Canada; adults overwinter in fast moving water at the junction of the Kennebecasis and Hammond rivers at depths of 3 to 6 m. Little is known about the juveniles, but they have been caught between 35 and 120 km upstream from the mouth of the Saint John River estuary.
	Threats to Species and Habitat ▪ The Mactaquac Dam prevents the potential for migration and spawning upstream of the dam. There is currently no effective way to allow passage of ▪ Shortnose Sturgeon over this dam. The dam controls water flow and, therefore, some aspects of habitat availability and quality including water temperature. ▪ The Saint John River is a highly developed area with residential and industrial activities all impacting water quality. Because Shortnose Sturgeon are long-lived, bottom-dwelling fish and consume prey living in the sediments, they are exposed to contaminants in both sediments and the prey items.

***Scientific Name* / Common Name Status**	**Risk Assessment and Decision**
	Shortnose Sturgeon are subject to by-catch in the Gaspereau, American Shad, American Eel and Atlantic Sturgeon fisheries. They are also caught in a recreational fishery, but the minimum size for retention (120 cm) protects the majority of the population. ▪ Muskellunge, an invasive, predatory fish species in the Saint John River, may prey upon Shortnose Sturgeon juveniles.
	Current Management ▪ AV Group Nackawic do not have a species specific management plan/approach in-place. ▪ Shortnose Sturgeon are angled recreationally in the Saint John River and their population and habitat are, therefore, protected by the federal Fisheries Act. No recreational fishing is allowed within a 10 km stretch downstream of the Mactaquac Dam, which should protect Shortnose Sturgeon during reproduction.
	Decision The assessment concluded that the Atlantic Sturgeon Maritimes populations is **not considered as HCV**. ▪ Rationale: o There is no occurrences of this species within the Freehold. o Habitat and needs of this species are not likely to be compromised by the forestry activities of the Organization.
	Sources ▪ Shortnose Sturgeon (Acipenser brevirostrum) - Species search - Species at risk registry (canada.ca) ▪ COSEWIC. 2015. COSEWIC assessment and status report on the Shortnose Sturgeon Acipenser brevirostrum in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xii + 48 pp. (www.registrelep-sararegistry.gc.ca/default_e.cfm).
Osmerus mordax Rainbow Smelt Lake Utopia small-bodied population Threatened	**Status Justification** ▪ The Lake Utopia Rainbow Smelt - Small-bodied Population (LURS-SbP), previously known as Lake Utopia Dwarf Smelt was assessed by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) in 2000. LURS-SbP has been listed as Threatened on Schedule 1 of the Species at Risk Act (SARA) since the Act came into force in 2003. In 2008, COSEWIC assessed both the small-bodied and large-bodied populations of LURS and designated each as Threatened. The rationale for this designation was the same for both populations: together, they are part of a unique species pair, they are endemic, and their single occurrence is limited in extent and subject to a number of the same existing and potential threats.
Osmerus mordax Rainbow Smelt Lake Utopia large-bodied population Threatened	**Habitat** ▪ Following the area of occurrence approach, critical habitat for LURS-SbP has been identified as: The water column, substrate and LbP features of Lake Utopia in the Magaguadavic River watershed in Charlotte County, New Brunswick (total surface area 14 km^2), and part of the following tributaries of Lake Utopia: Smelt Brook, Unnamed Brook, and Second Brook (total combined length of 586 m).
	Threats to Species and Habitat ▪ There are five major categories of threats that potentially impact the Lake Utopia sympatric pair: habitat alteration and degradation; enhancement of native predatory fishes and/or introduction of exotic species; water quality; recreational fishing; and hybridization. The threats to the Large-bodied population are considered high due to the recent perceived use of just one tributary stream for spawning (Mill Lake Stream). Additionally, spawning was not observed in this stream at all in some years.

***Scientific Name* / Common Name Status**	**Risk Assessment and Decision**
	▪ There are five major categories of threats that potentially impact the Lake Utopia sympatric pair: habitat alteration and degradation; enhancement of native predatory fishes and/or introduction of exotic species; water quality; recreational fishing; and hybridization. The threats to the Small-bodied population are considered medium.
	Current Management ▪ AV Group Nackawic do not have a species specific management plan/approach in-place. ▪ While both populations of LURS continue to be afforded all of the fisheries protection provisions under the Fisheries Act, only the SbP is listed on Schedule 1 of SARA and therefore is subject to the prohibitions and recovery planning requirements of the Act. While the Recovery Strategy focuses on the survival of the species pair, where there are legislative applications of this document to SARA, they only apply as it relates to the LURS-SbP. In the future, if the LURS-Large-bodied Population (LURS-LbP) is listed on Schedule 1 of SARA, this Recovery Strategy will be amended to reflect that SARA applies to both members of the species pair.
	Decision The assessment concluded that the Rainbow Smelt populations are **not considered as HCV**. ▪ Rationale: o There is no occurrence of these species within the Freehold. o Habitat and needs of this species are not likely to be compromised by the forestry activities of the Organization.
	Sources ▪ Department of Fisheries and Oceans Canada. 2016. Recovery Strategy for the Lake Utopia Rainbow Smelt (Osmerus mordax), Small-bodied Population (sympatric with the Large-bodied Population), in Canada. Species at Risk Act Recovery Strategy Series. Fisheries and Oceans Canada. Ottawa viii + 57 pp. ▪ COSEWIC. 2018. COSEWIC assessment and status report on the Rainbow Smelt Osmerus mordax, Lake Utopia large-bodied population and the Lake Utopia small-bodied population, in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xiv + 40 pp. (http://www.registrelepsararegistry.gc.ca/default.asp?lang=en&n=24F7211B-1).
Acipenser oxyrinchus Atlantic Sturgeon Maritimes populations Threatened	**Status Justification** ▪ Designated as Threatened in May 2011 by COSEWIC. According to the COSEWIC, the abundance of these populations of Atlantic Sturgeon has declined significantly. Given its long lifespan, late maturity, and intermittent spawning, Atlantic Sturgeon is particularly susceptible to threats.
	Habitat ▪ The distribution of the Maritimes Atlantic Sturgeon population covers the entire southern Gulf of St. Lawrence. The northern border of the distribution in the Gulf slightly overlaps that of the St. Lawrence Atlantic Sturgeon population. The border forms a straight line from Rivière-au-Renard to the west and a point around Corner Brook, Newfoundland to the east. The distribution of the Maritimes Atlantic Sturgeon population extends to southeast, out of the Gulf, past Cabot Strait. It follows the coast of Newfoundland, including the part of the Burin peninsula pointing towards Saint-Pierre and Miquelon. In the southwest, the distribution extends in a point to Cape Breton in the Atlantic, incorporating Sable Island, forming a thin band along Nova Scotia and covering the entire Bay of Fundy and southern New Brunswick. Atlantic Sturgeon live in rivers, estuaries, the nearshore marine

Scientific Name / **Common Name** **Status**	**Risk Assessment and Decision**
	environments and the continental shelf regions along the Atlantic coast of North America. Atlantic Sturgeon spawn in relatively shallow fresh water over rocky substrate, preferring depths of one to three metres with a strong current. ▪ Juveniles may overwinter in freshwater or move into estuaries when temperatures drop in the fall. Mature Atlantic Sturgeon spend time in estuaries and smaller bays as it is thought to help in transitioning between salt and fresh water. Adults spend much of their non-breeding time at sea where they can migrate over extensive distances along the coast while feeding.
	Threats to Species and Habitat ▪ The most significant threats to Atlantic sturgeon are unintended catch in some commercial fisheries, dams that block access to spawning areas, poor water quality (which harms development of sturgeon offspring), dredging of spawning areas, water withdrawals from rivers, and vessel strikes. ▪ Pollution in freshwater and marine environments has also been identified as a potential threat to Atlantic Sturgeon habitat.
	Current Management ▪ AV Group Nackawic do not have a species specific management plan/approach in-place. ▪ There is currently a commercial fishery for Atlantic Sturgeon in the Saint John River which has a quota of 350 fish. All retained Atlantic Sturgeon are required to be tagged with a security tag provided by DFO, and the license holder must contact an independent dockside monitoring company to advise them of the number and sex of Atlantic Sturgeon caught and retained, and to report the tag numbers used. License holders are also required to submit detailed logbooks at the close of the season, and to return all unused tags. This data is used to make management decisions about the fishery. ▪ Fisheries officers monitor the fishery as part of their regular patrols in the area. There is also a recreational fishery for Atlantic Sturgeon in this river that is primarily catch-and-release, although a small number can be retained. DFO is currently collaborating with multiple stakeholders and partners to undertake scientific research on Atlantic Sturgeon, including hydro-acoustic tracking studies to help identify spawning areas and an examination of the scope for interaction between Atlantic Sturgeon and in-stream tidal power generation ▪ Atlantic Sturgeon is currently listed under the Convention on International Trade in Endangered Species (CITES) Appendix II, so Canada must demonstrate that exports of Atlantic Sturgeon products will not be detrimental to the survival of the species in the wild. As part of satisfying this requirement, Canada is working with international partners to develop a strategy for the sustainable management of Atlantic Sturgeon.
	Decision The assessment concluded that the Atlantic Sturgeon Maritimes populations is **not considered as HCV**. ▪ Rationale: ○ There is no occurrences of these species within the Freehold. ○ Habitat and needs of this species are not likely to be compromised by the forestry activities of the Organization.
	Sources ▪ Response Statement – Atlantic Sturgeon, Maritimes populations (Dec. 8, 2011). Available online at: rs_1155_425_2011-9_e.pdf (canada.ca) ▪ Atlantic Sturgeon (Maritimes Population) (dfo-mpo.gc.ca) ▪ Atlantic Sturgeon | NOAA Fisheries ▪ COSEWIC. 2011. COSEWIC assessment and status report on the Atlantic Sturgeon Acipenser oxyrinchus in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xiii + 49 pp. (www.sararegistry.gc.ca/status/status_e.cfm).

Table 4. New Brunswick species at risk – Mammals.

Lynx canadensis Canada Lynx Endangered	**Status Justification** ▪ Density varies regularly over 10-11 year cycles, following the cycles in abundance of its main prey, the snowshoe hare. Although numbers have declined in parts of its southern range, notably in New Brunswick and Nova Scotia, overall, the Canadian population is secure. ○ In the Atlantic provinces of Nova Scotia and New Brunswick where the Canadian lynx is listed as critically Imperiled based on NatureServe's provincial designation. ▪ In New Brunswick, Canada Lynx is regionally Endangered. Still, the population size and trends for the lynx population in New Brunswick is poorly understood. The data we do have indicate that the lynx may occur throughout the province, but that it is more common in northern New Brunswick. ▪ Designated Not at Risk in April 1989 and in May 2001. Last assessment based on an update status report.
	Habitat ▪ The Canada lynx is commonly associated with extensive boreal forests ▪ Hare density is important when looking for lynx occurrence as they preferentially select for habitat where hare density exceeds 1.5 hares per hectare and avoid areas with hare density of less than 0.5 hares per hectare. Hares are most abundant in young regenerating or mature multi-storied forests with dense understory vegetation that provides food and cover.
	Threats to Species and Habitat ▪ Human development and climate change threaten the southern range of the Canada lynx and as such this portion of their range has shrunk in recent decades. ▪ Climate change is an issue because these cats require snowfall of 270 cm per year, which creates preferred habitat for snowshoe hare (Lepus americanus; lynx's key prey) and excludes competitors ▪ Fur harvesting. Legal traps for furbearers such as bobcat and coyote, account for more than half of lynx carcasses reported to Nova Scotia Department of Natural Resources between 1995 and 2004. ▪ Passable roads contribute to mortality through ease-of-access for hunters and trappers, coyotes and other competitors and predators, and act as impediments to Lynx movements.
	Current Management ▪ The only province of the Maritimes that had implemented a recovery plan for the Canada Lynx is Nova Scotia. The feasibility of lynx recovery is uncertain given the paucity of available local data applicable to the Cape Breton population. Notwithstanding these deficiencies, this plan describes a broad strategy for recovery, research, education, stewardship, and management activities required to meet three recovery objectives: (1) minimize human caused mortality, (2) manage habitat for lynx, and (3) maintain and restore functional connectivity for lynx populations in Cape Breton and New Brunswick. ▪ AV Group Nackawic do not have a species specific management plan/approach in-place.
	Decision The assessment concluded that the Canada Lynx is **considered as possible HCV**. ▪ Rationale:

	○ Carnivores are good candidates for focal species as they are often sensitive to habitat changes, have large ranges, and experience strong competitive pressure (Carroll, Noss, & Paquet, 2001). A benefit to the focal species approach is that it identifies the species that are most sensitive to the threats in a specific area. ○ It is likely to have occurrences of this species within the Freehold. ○ AV Group Nackawic do not have a species specific management plan in-place.
	Sources ▪ Carroll, Carlos & Noss, Reed & Paquet, Paul. (2001). Carnivores as Focal Species for Conservation Planning in the Rocky Mountain Region. Ecological Applications - ECOL APPL. 11. 961-980. 10.2307/3061005. ▪ Natural Resources and Energy Development – New Brunswick. Canada Lynx. Available online at https://www2.gnb.ca/content/gnb/en/departments/erd/natural_resources/content/wildlife/content/SpeciesAtRisk/canada_lynx.html ▪ Reya Manerikar (2018). Quantifying habitat effectiveness for bobcat (Lynx rufus), Canada lynx (Lynx canadensis), and eastern cougar (Puma concolor couguar) in Nova Scotia, Canada. Available online at https://cdn.dal.ca/content/dam/dalhousie/pdf/science/environmental-science-program/Honours%20Theses/2018/RiyanaManerikar.pdf. ▪ Nova Scotia Lynx Recovery Team. 2006. Provincial Recovery Plan for the Canada Lynx (Lynx canadensis), Nova Scotia. 32 pp. ▪ Parks Canada Agency. 2016. Multi-species Action Plan for Kouchibouguac National Park of Canada and associated National Historic Sites of Canada. Species at Risk Act Action Plan Series. Parks Canada Agency, Ottawa. v + 20 pp.
Myotis lucifugus Little Brown Myotis Endangered *Myotis septentrionalis* Northern Myotis Endangered *Perimyotis subflavus* Tri-colored Bat Endangered	**Status Justification** ▪ Little Brown Myotis and Northern Myotis: Declines of 94% have occurred in the known hibernating populations in Nova Scotia, New Brunswick, Ontario, and Quebec due to White-nose Syndrome (WNS). Designated Endangered in an emergency assessment on February 3, 2012. Status re-examined and confirmed in November 2013. ▪ Tri-colored Bat: Declines of more than 75% have occurred in the known hibernating populations in Quebec and New Brunswick due to WNS. Designated Endangered in an emergency assessment on February 3, 2012. Status re-examined and confirmed in November 2013. ○ Donald McAlpine says the tri-coloured bat, a rare species to begin with, hasn't been seen in overwintering caves since 2013. Despite a lack of an official survey, the province's leading bat expert said it's likely locally extinct. ▪ New Brunswick listed all three species as Endangered in 2013.
	Habitat ▪ All three species overwinter in cold and humid hibernacula (caves/mines). Their specific physiological requirements limit the number of suitable sites for overwintering. In the east, large numbers (i.e., >3000 bats) of several species typically overwinter in relatively few hibernacula. In the west, there are fewer known hibernacula, and numbers appear lower per site. Females establish summer maternity colonies, often in buildings (mainly Myotis lucifugus), or large-diameter trees. Foraging occurs over water (mainly M. lucifugus, P. subflavus), along waterways, forest edges, and in gaps in the forest (mainly M. septentrionalis). Large open fields or clearcuts generally are avoided. In autumn, bats return to hibernacula, which may be hundreds of kilometres from their summering areas, swarm near the entrance, mate, and then enter that hibernaculum, or travel to different hibernacula to overwinter.
	Threats to Species and Habitat ▪ White-noise syndrome. Population sizes are unknown but were likely over a million for each of the Myotis species prior to the 2010 arrival in Canada of White-nose Syndrome (WNS), a disease caused by a cold-loving fungus Pseudogymnoascus destructans (Pd), likely originating from Europe.

	▪ Other threats besides WNS include colony eradication, chemical contamination, change in forest structure, and wind turbines.
	Current Management ▪ AV Group Nackawic do not have a species specific management plan/approach in-place. ▪ Bat inventory via non-profit organization, researchers and New Brunswick Department of Natural Resources. ▪ Atlantic Coastal Action Plan (ACAP) Cape Breton has been monitoring bats on Cape Breton Island since 2013. Monitoring efforts primarily involve long-term deployment of acoustic detectors in summering habitat and at known and potential hibernacula, and conducting maternity colony counts. In 2015, the program expanded by including additional monitoring sites in New Brunswick, Quebec and Newfoundland though partnerships with La Société d'aménagement de la rivière Madawaska, the New Brunswick Museum, Attention FragÎles and ACAP Humber Arm. ▪ Several national parks across Canada are conducting bat monitoring using a national protocol developed by Parks Canada Agency and contributing to NABat.
	Decision The assessment concluded that the Little Brown Myotis, Northern Myotis and the Tri-colored Bat are **considered as possible HCV**. ▪ Rationale: o It is likely to have occurrences of this species within the Freehold. o At the stand scale, potential roost sites for bats such as caves, abandoned mines, hand-dug wells, cellars, tunnels, rock crevices, tree root hollows and snags are not or less subject to be disturb or destroy willfully by AV Group Nackawic activities since those are not aimed by the operations, unless there are safety issues related.
	Sources ▪ Parks Canada Agency. 2016. Multi-species Action Plan for Kouchibouguac National Park of Canada and associated National Historic Sites of Canada. Species at Risk Act Action Plan Series. Parks Canada Agency, Ottawa. v + 20 pp. ▪ Joseph Tunney (2018) 'Tri-coloured bat likely extinct in New Brunswick, zoologist says Social Sharing' *CBC News*. Available online at https://www.cbc.ca/news/canada/new-brunswick/tri-colored-bat-new-brunswick-1.4625449 ▪ Environment and Climate Change Canada. 2018. Recovery Strategy for the Little Brown Myotis (Myotis lucifugus), the Northern Myotis (Myotis septentrionalis), and the Tri-colored Bat (Perimyotis subflavus) in Canada. Species at Risk Act Recovery Strategy Series. Environment and Climate Change Canada, Ottawa. ix + 172 pp.

Table 5. New Brunswick species at risk – Reptiles.

Chelydra serpentine **Snapping Turtle** Special Concern	**Status Justification** ▪ The Canadian range of the Snapping Turtle (Chelydra serpentina) represents approximately 10% of its global range. In Canada, the species has been listed as Special Concern on Schedule 1 of the Species at Risk Act (S.C. 2002, c. 29) since 2011. ▪ It has been listed as a species of special concern under the New Brunswick Species at Risk Act (S.N.B. 2012, c. 6) since 2011. ▪ In 2010, the International Union for the Conservation of Nature (IUCN) ranked the Snapping Turtle as least concern (IUCN, 2015). It has a global conservation status rank of G5 (secure) and a national status rank of N5 (secure) in Canada and the United States. The species has a status rank of S4 (apparently secure) in New Brunswick.
	Habitat ▪ In New Brunswick, it is found in all counties of the province, except Restigouche in the north. ▪ Snapping Turtles occupy a wide variety of habitats. The preferred habitat for this species is characterized by slow-moving water with a soft mud bottom and dense aquatic vegetation. ▪ Established populations are most often found in ponds, marshes, swamps, peat bogs, shallow bays, river and lake edges, and slow-moving streams. ▪ Although individual turtles may persist in developed areas (for example, golf course ponds, irrigation canals) and environments with heavily polluted water (for example, some port areas), it is unlikely that local populations will persist in such habitats, since environmental contamination is known to severely compromise reproductive success (COSEWIC, 2008).
	Threats to Species and Habitat ▪ The Snapping Turtle is confined to the more southern parts of Canada, which are the most heavily populated areas and subject to the most intensive agricultural operations. Snapping Turtle habitat has declined appreciably in both quantity and quality, with losses primarily due to conversion of wetlands, aquatic habitats (for example, streams, water bodies, ponds) and associated riparian terrestrial habitats for agriculture and urban development (COSEWIC, 2008). Conversion can make all or parts of habitats partially or entirely unusable for certain stages of the species' life cycle (for example, riprap or concrete walls installed along shorelines can reduce nest site availability and act as a barrier to movement) or destroy them outright (for example, filling of a wetland for agriculture or urban development reduces the area of habitat available for all life stages). ▪ Artificially lowering water levels in lakes and impoundments through the operation of water control structures (e.g., hydroelectric dams) may limit the availability of overwintering sites to turtles and may strand turtles in freezing temperatures and result in mortalities, depending on when such operations take place (COSEWIC, 2008). Management of water levels in beaver ponds also poses a problem for the species. ▪ Road mortality is a significant factor contributing to annual mortality in most of the turtle species found in North America, especially on roads that run through or are located adjacent to wetlands.
	Current Management ▪ Operational guidelines of forest management implemented by AV Group Nackawic already included the use of riparian buffer zones which limit the alteration to the watercourse and its surrounding vegetation. However, AV Group Nackawic do not have a species-specific management plan/approach in-place. ▪ Since the Snapping Turtle lives in association with other freshwater turtle species at risk in Eastern Canada (Spotted Turtle [Clemmys guttata], Eastern Musk Turtle [Sternotherus odoratus], Blanding's Turtle [Emydoidea blandingii], Spiny Softshell [Apalone spinifera], Wood Turtle [Glyptemys insculpta]

	and Northern Map Turtle [Graptemys geographica]), it has indirectly benefited from the many conservation measures implemented for these species (see the recovery planning documents for those species on the SARA Registry. ▪ The ECCC and Minister responsible for the Parks Canada Agency is the competent minister under SARA for the Snapping Turtle and has prepared this management plan. To the extent possible, the management plan has been prepared in cooperation with the governments of Saskatchewan, Manitoba, Ontario, Quebec, New Brunswick and Nova Scotia, as per section 66(1) of SARA. Implementation of this management plan is subject to appropriations, priorities, and budgetary constraints of the participating jurisdictions and organizations. ▪ Hunting of Snapping Turtles is prohibited in New Brunswick.
	Decision The assessment concluded that the Snapping Turtle is **considered as HCV.** ▪ Rationale: o It is likely to have occurrences of this species within the Freehold. Known occurrences are mapped. o Suitable habitat is available and is sufficient to support the species' current distribution, and suitable unoccupied habitat exists at both locations as well. o Habitat and needs of this species are not likely to be heavily compromised by forestry activities in New Brunswick.
	Sources ▪ Environment and Climate Change Canada. 2020. Management Plan for the Snapping Turtle (Chelydra serpentina) in Canada. Species at Risk Act Management Plan Series. Environment and Climate Change Canada, Ottawa, iv + 40 p. ▪ Department of Natural Resources: Species at Risk Public Registry (gnb.ca)
Glyptemys insculpta Wood Turtle Threatened	**Status Justification** ▪ This species is declining across much of its range, and occurs in small, increasingly disjunct populations. It has a long-lived life history typical of turtles, so that almost any chronic increase in adult and juvenile mortality leads to a decrease in abundance. The total number of adults in Canada is likely declining at a rate > 10% in three generations (COSEWIC 2007). Increased level of threat is associated with new or increased access to the species' range by people. ▪ Canada has approximately 30% of the global distribution of the Wood Turtle (COSEWIC 2007). In March 2010, the species was listed as Threatened on Schedule 1 of the Species at Risk Act (SARA) (S.C. 2002, c. 29). In New Brunswick, the species is listed as Threatened under the new Species at Risk Act (2013). The International Union for the Conservation of Nature (IUCN) assessed the Wood Turtle as Endangered in 2010. NatureServe (2014) conservation ranks for New Brunswick is Vulnerable.
	Habitat ▪ The Wood Turtle is found only in eastern North America, from Nova Scotia westward through New Brunswick, Quebec, Ontario and Minnesota, and southward to Virginia, West Virginia and Maryland. ▪ The Wood Turtle spends a great deal of time in or near the water of wide rivers, preferring shallow, clear streams with compacted and sandy bottoms. The wood turtle can also be found in forest and grasslands but will rarely be seen more than several hundred meters from flowing water. Wood Turtles were previously thought to be strictly associated with freshwater environments with salinity up to 0.1 ppm (Reference removed), but a recent study in New Brunswick showed that 12 individuals used brackish water and estuaries with salinity up to 30 ppm for several months, and even nested in associated habitat. Wood Turtles may also use bogs, marshy pastures, beaver ponds, oxbows, riparian and shrub areas, meadows, hay and agricultural fields, and utility rights-of-way.

	▪ In one telemetric study performed in New Brunswick, the highest probability (69%) of finding Wood Turtles was at a distance of 0–10 m from a stream between May 1 and July 1, while the highest probability (50%) was at distances greater than 50 m from a stream between July 2 and October 1 (Reference removed). For the October–November period, 90% of the available telemetry locations in Quebec are within 62 m of a stream. ▪ Wood Turtle critical habitat is partially identified in the recovery strategy. The Minister of the Environment, on the advice of COSEWIC, has restricted the release of information that relates to the location of the Wood Turtle or its habitat (SARS, s. 124). Wood turtle critical habitat is therefore presented at the 1:250,000 scale so as to not compromise this sensitive information. ▪ Critical habitat for the Wood Turtle is identified in 75 watersheds across the Canadian range: 12 in Ontario, 20 in Quebec, 25 in New Brunswick and 18 in Nova Scotia. Application of the criteria specifically identifies 200 units as containing critical habitat for the Wood Turtle, totalling 1074 km^2: 34 in Ontario (193 km^2); 72 in Quebec (418 km^2); 60 in New Brunswick (259 km^2) and 34 in Nova Scotia (204 km^2).
	Threats to Species and Habitat ▪ According the Federal Recovery Strategy for the Wood Turtle road network and agricultural practices are the most serious threats to Wood Turtle. ▪ Forestry practices involving heavy machinery (e.g. harvesting, scarification) can kill or harm individuals. As with agricultural practices and road networks, direct impacts caused by forestry practices occur during the Wood Turtle active season when individuals are using terrestrial habitat. ▪ Forestry practices may remove or alter suitable terrestrial habitat. ▪ Clear-cutting may contribute to the flooding of streamside nests and increase sedimentation of streams inhabited by the species. If clear-cutting is followed by land conversion, these effects could be permanent.
	Current Management ▪ Operational guidelines of forest management implemented by AV Group Nackawic already included the use of riparian buffer zones which limit the alteration to the watercourse and its surrounding vegetation. However, AV Group Nackawic do not have a species-specific management plan/approach in-place. ▪ Search effort since 2007 led to an increase in the estimated area of occupancy, with the discovery of several new locations occupied by the species in Quebec (Centre de données sur le patrimoine naturel du Québec [CDPNQ] 2014), New Brunswick and Nova Scotia (AC CDC 2014). ▪ Concentrated efforts to increase Wood Turtle sightings by naturalists with the New Brunswick Museum, have expanded the number of known occurrences. Pilot projects on threat identification and stewardship have been initiated on three watersheds representing three different contexts: agricultural landscape, forestry-dominated area, region with high number of outdoor recreational activities (e.g., angling, hunting and canoeing). Initial work on implementing the coordinated monitoring strategy for Wood Turtle in the Northeastern United States (Jones et al. 2013). DND has conducted Wood Turtle studies and management on New Brunswick DND sites. ▪ Measures to address potential threats and mitigation measures have been drafted at one New Brunswick DND site. The New Brunswick Department of Natural Resources and Energy Development is currently drafting a recovery strategy for Wood Turtle in New Brunswick. Several habitat stewardship projects have been conducted by non-governmental and governmental organizations. Radio-telemetry studies were performed to gather information on habitat use and population characteristics. ▪ In partnership with Environment Canada's Canadian Wildlife Service and the New Brunswick Department of Energy and Resource Development, the Miramichi River Environmental Assessment Committee (MREAC) staff, partners, and volunteers have assessed Wood turtle presence/absence and their habitat on the major Miramichi River tributaries. When encountered a specimen is photographed and its location recorded; data is then shared with these jurisdictional agencies. MREAC annually acquires the necessary research permit from New Brunswick and observes the strict protocol to engage with Wood turtle specimens as little as necessary. This project has been active since 2011.

	▪ Hunting of Wood Turtles is prohibited in New Brunswick.
	Decision The assessment concluded that the Wood Turtle **is considered as possible HCV**. ▪ Rationale: o It is likely to have occurrences of this species within the Freehold since critical habitat' criteria described in section 7.1 of the SARA Recovery Strategy are met within 1:250 000 National Topographic System (NTS) Number 021G and 021J. The AV Group Nackawic Freehold overlap NTS # 021G and 021J. o Although threats are listed individually, an important concern is the long-term cumulative effect of such a variety of threats on local Wood Turtle populations. Most of these threats apply only during the active season (generally April to October) since they lead to direct mortality or injury. Moreover, exposure increases in periods in which Wood Turtle movements increase (e.g., nesting, when some females have been known to move several kilometres between overwintering and nesting sites in the spring). Threats such as road networks and forestry practices can contribute to further isolate remaining populations. • Most of the local Wood Turtle populations in New Brunswick are located in forested landscapes where forestry practices may take place. Still, little is known about the direct effects of forestry practices on Wood Turtles. Because of the nature of this threat, direct effects are likely to occur only 1-4 times every 100 years within a specific area, when actual harvesting or other forestry practices take place. Kaufmann (1992) suggests that some small-scale forest clearing may be beneficial. In conclusion, a precautionary approach shall prevail.
	Sources ▪ Environment and Climate Change Canada. 2020. Recovery Strategy for the Wood Turtle (Glyptemys insculpta) in Canada. Species at Risk Act Recovery Strategy Series. Environment and Climate Change Canada, Ottawa. vi + 52 pp. ▪ Department of Natural Resources: Species at Risk Public Registry (gnb.ca)

Table 6. New Brunswick species at risk – Vascular Plants.

***Scientific Name* / Common Name Status**	**Risk Assessment and Decision**
Symphyotrichum anticostense Anticosti Aster Endangered	**Status Justification** ▪ It is listed as Threatened under Schedule 1 of the Species at Risk Act. COSEWIC designated it Threatened in April 1990 and its status was re-examined and confirmed in May 2000. ▪ In New Brunswick, it is designated as Endangered and protected by provisions of the provincial Endangered Species Act.
	Habitat ▪ Along several large fast-flowing rivers in northern, central and southern New Brunswick. The Anticosti Aster is confirmed or is thought to be present at 31 locations in Canada, along 26 rivers and five lakes in the provinces of New Brunswick and Québec. ▪ Within New Brunswick, Anticosti Aster was recorded from two sites on the Restigouche River, three sites on the upper Saint John River, two extant and one presumed extirpated (since 1945 near Woodstock) (COSEWIC, 2000). ○ A genetic analysis must be conducted to determine the presence of the Anticosti Aster, particularly in New Brunswick, and determine its distribution and abundance, and the population structure of the species. Given these uncertainties, critical habitat is not identified in this recovery strategy.
	Threats to Species and Habitat ▪ Threats to the Anticosti Aster include shoreline development, recreational activities, dam construction and riparian zone development, woody debris, grazing by white-tailed deer, hybridization and invasive species. All these threats affecting the Anticosti Aster species are localized in nature and none appear to jeopardise the persistence of the species on a national level.
	Current Management ▪ Implementation of several broad strategies and general approaches, including research, surveys and monitoring, and education/outreach. ▪ Currently, the aster's habitat is regulated by various measures in both Québec and New Brunswick. Effective communication between departments and agencies should take place to ensure regulations for the protection of aster habitat are applied. Various mechanisms are available for ensuring adequate protection of habitat at known locations, including legal tools, voluntary or stewardship agreements. ▪ AV Group Nackawic do not have a species specific management plan/approach in-place.
	Decision The assessment concluded that the Anticosti Aster is **not considered as HCV**. ▪ Rationale: ○ Suitable habitat is available and most of it is still in a largely natural state and is sufficient to support the species' current distribution, and suitable unoccupied habitat exists at both locations as well. • The distribution and area of occupancy of the Anticosti Aster has been maintained. • The recovery of Anticosti aster has been determined to be technically and biologically feasible. ○ Habitat and needs of this species are not likely to be compromised by forestry activities in New Brunswick. ○ No evidence has been found regarding the occurrences of this species within the Freehold.

***Scientific Name* / Common Name Status**	**Risk Assessment and Decision**
	Sources ▪ Environment Canada. 2012. Recovery Strategy for the Anticosti Aster (Symphyotrichum anticostense) in Canada. Species at Risk Act Recovery Strategy Series. Environment Canada. Ottawa, v + 15 pp.
Symphyotrichum subulatum Bathurst Aster, Bathurst population Endangered	**Status Justification** ▪ The Bathurst aster is a true New Brunswick endemic, being found nowhere else in the world.
	Habitat ▪ The Bathurst aster is a coastal or salt marsh plant found in the northeastern region of New Brunswick. ▪ It is found on gravel strands or adjacent salt marshes, where they are covered daily by tidal waters. ▪ Four of the five largest subpopulations are in New Brunswick (Charlo River, Jacquet River, Cape Jourimain and Bass River). Those five subpopulations support between 91% and 97% of the Canadian population.
	Threats to Species and Habitat ▪ Habitat alteration associated with residential development, transportation corridors and/or recreational activities associated with residences are potential or existing minor threats at most subpopulations. Bathurst Harbour and most Miramichi Bay subpopulations have extensive housing immediately adjacent to or near occupied habitat. ▪ Sea level rise and severe weather, which could eliminate occupied habitat or increase estuary salinity beyond tolerated levels, may be significant future threats. ▪ Natural limiting factors may include low probability of dispersal to available habitat, and the species' narrow niche requirements.
	Current Management ▪ Coastal stewardship, such as protecting salt marshes, is an effective measure in conserving this species. ▪ AV Group Nackawic do not have a species specific management plan/approach in-place.

	Decision
	The assessment concluded that the Bathurst Aster, Bathurst population is **not considered as HCV**.
	▪ Rationale:
	  ○ Habitat and needs of this species are not likely to be compromised by forestry activities in New Brunswick.
	  ○ Known occurrences are outside of the Freehold.

	Sources ▪ COSEWIC. 2017. COSEWIC assessment and status report on the Annual Saltmarsh Aster Symphyotrichum subulatum in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xii + 52 pp.
Lechea maritima Beach Pinweed Special Concern	**Status Justification** ▪ Designated Special Concern in April 2008 by COSEWIC and listed as Special Concern in New Brunswick Species at Risk Act. ▪ Beach Pinweed is considered Globally Secure (G5) at the species level, but the Canadian population is considered a taxonomically distinct and globally imperilled variety (Lechea maritima var. subcylindrica, G5T2) endemic to the Gulf of St. Lawrence shores of New Brunswick and Prince Edward Island (NatureServe 2011).

Scientific Name / **Common Name** Status	**Risk Assessment and Decision**
	Habitat ▪ In Canada it is restricted to small portions of the Gulf of St. Lawrence shores of New Brunswick and Prince Edward Island. ▪ The majority of the 15 populations, including the three largest, occur at elevations under 5 m above sea level. ▪ Beach Pinweed is occurring on large and relatively stabilized barrier dune systems, mostly in unforested, sandy habitats with little or no soil profile development, limited moisture and low nutrient levels.
	Threats to Species and Habitat ▪ There are indications that it may be declining in response to increased storm frequency and intensity that is likely linked to climate change and that climate change-related impacts on the species are likely to increase through the future. ▪ Beach Pinweed is minimally affected by direct anthropogenic impacts. However, off-highway vehicle uses in coastal ecosystems such as dunes and wetlands are a potential threat to most Beach Pinweed populations.
	Current Management ▪ An estimated 60% of the Canadian population of Beach Pinweed is within protected areas and an additional 31% is within federal lands on Hog Island. ○ The largest Canadian populations of the species are within Kouchibouguac National Park, along with large occurrences to the south near Richibucto and Bouctouche, New Brunswick which collectively represent 71% of the Canadian population. ▪ Staff of Nature NB's Piper Project are aware of Beach Pinweed and have made some efforts to find it in suitable habitat on the Acadian Peninsula.

	Decision
	The assessment concluded that the Beach Pinweed is **not considered as HCV**.
	▪ Rationale:
	  ○ Habitat and needs of this species are not likely to be compromised by forestry activities in New Brunswick.
	  ○ Known occurrences are outside of the Freehold.

	Sources ▪ Environment Canada. 2013. Management Plan for the Beach Pinweed (Lechea maritima) in Canada. Species at Risk Act Management Plan Series. Environment Canada, Ottawa. iii + 18 pp.
Juglans cinerea Butternut Endangered	**Status Justification** ▪ Butternut (Juglans cinerea L.) is a species of tree designated as Endangered by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) and was listed in July 2005 as Endangered on Schedule 1 of the Species at Risk Act (SARA) in Canada. ▪ It is considered Critically Imperilled in New Brunswick and listed under the New Brunswick Species at Risk Act but with no prohibitions in place.
	Habitat ▪ In New Brunswick, Butternut occurs mainly as a bottomland tree of major river systems, though its natural range does not extent into the northern parts of the province. ▪ Butternut can tolerate a large range of soil types. It typically grows best on rich, moist, well drained loams often found along stream banks but can also be found on well-drained gravelly sites, especially of limestone origin.
	Threats to Species and Habitat

***Scientific Name* / Common Name Status**	**Risk Assessment and Decision**
	▪ The fundamental threat and principal one noted within the COSEWIC Status Report is butternut canker. o Butternut canker is a serious threat and limiting factor for the species. Although healthy butternut trees have grown amongst diseased trees, the situation is extremely rare. It has not yet been shown that this putative resistance reflects actual genetic differences or if resistance is a result of the environment (e.g. ideal site conditions), or a combination of both genetics and environment.
	Current Management ▪ The national Recovery Strategy for the Butternut (Juglans cinerea) in Canada has been prepared by Environment Canada (2010). New Brunswick was consulted in the preparation of this document. ▪ In New Brunswick, there are a total of 151 recorded butternut sites (Butternut Canker in New Brunswick Workshop, February 2004) with a conservative estimate of 7 000- 17 000 trees (based upon forest development survey information, permanent sample plots and personal experience of field staff from the New Brunswick Department of Natural Resources, unpublished report). ▪ A database was set up by the Canadian Forest Service (Atlantic Forestry Centre) to maintain information provided by the public on location and health of trees. An educational program was also set up by Natural Resources Canada, Canadian Forest Service (Atlantic Region) and the New Brunswick Federation of Woodlot Owners to enable woodlot owners to identify the tree and symptoms of butternut canker disease. ▪ A butternut conservation strategy was developed by the New Brunswick Gene Conservation Working Group. ▪ AV Group Nackawic do not have a species specific management plan/approach in-place. ▪ Outlined in the COSEWIC assessment: Cutting of Butternut is unregulated in New Brunswick, and is likely especially frequent in western New Brunswick, where about 95% of known occurrences are on private land (AC CDC 2016).
	Decision The assessment concluded that the Butternut **is considered as possible HCV**. ▪ Rationale: o Some occurrences of this species are likely to be within the Freehold forest. o There are unknowns regarding the feasibility of recovery of the butternut. o AV Group identified Butternut tree when occurrence is found.
	Sources ▪ Environment Canada. 2010. Recovery Strategy for the Butternut (Juglans cinerea) in Canada. Species at Risk Act Recovery Strategy Series. Environment Canada, Ottawa vii + 24 pp. ▪ COSEWIC. 2017. COSEWIC assessment and status report on the Butternut Juglans cinerea in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xiii + 74 pp.
Pedicularis furbishiae Furbish's Lousewort	**Status Justification** ▪ NatureServe ranks the Furbish's Lousewort as imperiled globally (G2), imperiled nationally in the United States (N2), and critically imperiled in Canada (N1) and in New Brunswick (S1). ▪ The Canadian population likely represents between 5 and 15 % of the global population.

***Scientific Name* / Common Name Status**	**Risk Assessment and Decision**
Endangered	**Habitat** ▪ Five sites are known to be occupied by Furbish's Lousewort and these five sites are identified as critical habitat. New Brunswick faces some unique scenarios and challenges in the conservation of Furbish's lousewort. The typical habitat as described from Maine's larger populations occurs along free flowing river where the dynamics that are believed to be responsible for the survival of the species are essentially intact. ▪ The species generally occurs on ice- or flood-scoured river shore, where disturbance events have reduced competing vegetation. Establishment of new plants is fostered by moss cover, moist soils and partial shade.
	Threats to Species and Habitat ▪ Use of pesticide or herbicides, resulting in changes to the native vegetation. ▪ Change in river dyna mics causing erosion or changes to the habitat through dam construction and through local projects. ▪ Loss of buffer trees along the river bank or around inland sites reducing the amount of moderate shade. ▪ Indiscriminate disturbances created by recreational activities such as hiking or cycling, residential or commercial construction, construction or maintenance of roads, trails and railways either proximate to the area of occurrence or adjacent to the area of occurrence that may result in small-scale erosion.
	Current Management ▪ New Brunswick Furbish's Lousewort Recovery Strategy recommended that the immediate focus be on the conservation of existing sites, by pursuing conservation options with landowners and through the collaborative development of site management plans. However, there is no action plan or specific management undergo for this species in New Brunswick (except for protection of known occurrence sites). ▪ AV Group Nackawic do not have a species specific management plan/approach in-place.
	Decision The assessment concluded that the Parker's Pipewort is **not considered as HCV**. ▪ Rationale: ○ Habitat and needs of this species are not likely to be heavily compromised by forestry activities in New Brunswick. ○ Known occurrences are outside of the Freehold.
	Sources ▪ Furbish's Lousewort Recovery Team. 2006. Recovery strategy for Furbish's lousewort (Pedicularis furbishiae) in New Brunswick. New Brunswick Department of Natural Resources. Fredericton, New Brunswick. ▪ Environment Canada. 2010. Recovery Strategy for the Furbish's Lousewort (Pedicularis furbishiae) in Canada. Species at Risk Act Recovery Strategy Series. Environment Canada, Ottawa. vi pp. + appendices.
Eriocaulon parkeri Parker's Pipewort Endangered	**Status Justification** ▪ In April 2007, COSEWIC reassessed the status of Parker's Pipewort and concluded that the species was Not at Risk. However, NB SARA Status for the Parker's Pipewort is Endangered, and it is registered on the province Endangered Species Act.
	Habitat

***Scientific Name* / Common Name Status**	**Risk Assessment and Decision**
	▪ The species is an annual shoreline plant adapted to freshwater or slightly brackish intertidal waters within portions of the estuary of the Miramichi River in New Brunswick. o Approximately 114 occurrences are believed extant, with the most in Quebec ▪ The species occupies a narrow shoreline zone of suitable habitat but is present at many sites and has several very large populations that are at limited risk within both regions of the species disjunct range in Canada.
	Threats to Species and Habitat ▪ Threats include habitat loss/degradation due to shoreline development (the major threat), hydrologic changes (e.g. from dams and floodgates), dredging and landfilling, changes in sediment dynamics (e.g. from management that changes stream velocity), water pollution, shoreline scouring due to ship traffic, ATV activity in the intertidal zone, and sea level rise from climate change.
	Current Management ▪ No approved Management Plan for the Parker's Pipewort in Canada is in place. ▪ Upstream buffers to preserve water quality is already apply on the Freehold. Operational guidelines of forest management implemented by AV Group Nackawic already included the use of riparian buffer zones which limit the alteration to the watercourse and its surrounding vegetation.
	Decision The assessment concluded that the Parker's Pipewort is **not considered as HCV**. ▪ Rationale: o Lack of documentation for this species in New Brunswick. o No evidence has been found regarding the occurrences of this species within the Freehold.
	Sources ▪ The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) (2007). COSEWIC Annual Report 2007. Minister of the Environment. Gatineau, Canada. 120 pp.
Pterospora andromedea Woodlands Pinedrops Endangered	**Status Justification** ▪ Pterospora andromedea is listed on NB SARA and considered critically imperiled (S1) by NatureServe, in New Brunswick.
	Habitat ▪ In New Brunswick, pinedrops are found only in old white pine or white pine-hemlock forests on rich soil. They generally occur where the soil humus is very thick, as a result of numerous years accumulation of pine needles and other plant matter on the forest floor. ▪ In New Brunswick, Pinedrops have been recorded at roughly a half dozen sites on steep river valley slopes, in the Saint John and Restigouche systems.
	Threats to Species and Habitat ▪ Disturbance to its mycorrhizal association is a threat. Eastern pinedrops rarity is influenced by the distribution and rarity of its fungal symbiont. ▪ Since they lack chlorophyll, pinedrops do not photosynthesize. Rather, they depend entirely on old pine or hemlock for nutrients, linking to their root systems through a special soil fungus.
	Current Management ▪ Neither of the NB province or AV Group Nackawic have a species specific management plan/approach in-place.

***Scientific Name* / Common Name Status**	**Risk Assessment and Decision**
	Decision The assessment concluded that the Woodlands Pinedrops is **considered as possible HCV**. ▪ Rationale: o Lack of documentation for this species in New Brunswick. o Although white pine occurs throughout New Brunswick, old stands on rich soils are much less common. Minimizing disturbance to these stands is a positive step in conserving the species. o No evidence has been found regarding the occurrences of this species within the Freehold. The only known site near the Freehold where we can find this species is the Currie Mountain Mixed Wood Stand Environmentally Significant Areas (ESA).
	Sources ▪ Mycorrhiza. 2012 Jul;22(5):393-402. doi: 10.1007/s00572-011-0414-y. Epub 2011 Oct 12.
Isoetes prototypus Prototype Quillwort Endangered	**Status Justification** ▪ The Prototype Quillwort is ranked nationally as imperiled/vulnerable (N2/N3) in Canada. It is considered an imperiled (S2) species in New Brunswick. It is listed as Endangered under the New Brunswick Endangered Species Act and as a Special Concern species under the federal Species at Risk Act (SARA).
	Habitat ▪ Prototype Quillwort is a submerged aquatic of small, oligotrophic (nutrient poor), usually cold, spring-fed lakes. ▪ It is usually found in 1.5 to 2.5 m of water (often near drop-offs), rooted in soft, flocculent oozy sediment over sand or gravel. Water colour in these lakes is usually clear but occasionally can be tannin-stained.
	Threats to Species and Habitat ▪ Threats identified by the Management Plan for Canada are based on what is known of other species in the genus and the magnitude of each threat is somewhat unclear. Identified threats are shoreline development, recreational activity, water pollution, long-term alteration of site hydrology and competition from exotic and/or more common native species.
	Current Management ▪ Under SARA, Management Plan for the Prototype Quillwort in Canada has been released. Strategies include monitoring and assessment; research; management (currently information is needed to develop tools for effective management); outreach and stewardship; protection; to assist in recovery management efforts. o All efforts concerning this species have until now been directed towards the surveying of potential habitat. In recent years, a significant number of lakes have been surveyed for the presence of Prototype Quillwort, both in Nova Scotia and New Brunswick. o In the longer term, as new information on the biology and ecology of the species becomes available, resources should be devoted to the production of a standard best practice guide for the management of populations and habitats.

***Scientific Name* / Common Name Status**	**Risk Assessment and Decision**
	▪ One of the known New Brunswick populations (11) is located on Department of National Defence land in the Gagetown Range and Training Area. As a result, CFB Gagetown has devoted resources to various initiatives concerning the protection of this species, including the mapping of lakes potentially containing Prototype Quillwort habitat and the surveying of a number of these sites. ▪ AV Group Nackawic do not have a species specific management plan/approach in-place.
	Decision The assessment concluded that the Prototype Quillwort is **not considered as HCV**. ▪ Rationale: o Habitat and needs of this species are not likely to be heavily compromised by forestry activities in New Brunswick. o Known occurrences are outside of the Freehold.
	Sources ▪ COSEWIC 2005. COSEWIC assessment and status report on the prototype quillwort Isoetes prototypus in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 31 pp. ▪ Environment Canada. 2012. Management Plan for the Prototype Quillwort (Isoetes prototypus) in Canada. Species at Risk Act Management Plan Series. Environment Canada, Ottawa. iii + 16 pp. ▪ Smith, K. 2016. Isoetes prototypus. The IUCN Red List of Threatened Species 2016: e.T70485370A70870136. https://dx.doi.org/10.2305/IUCN.UK.2016-1.RLTS.T70485370A70870136.en.
Listera australis Southern Twayblade Endangered	**Status Justification** ▪ The Southern Twayblade is listed as Endangered under the New Brunswick Endangered Species Act.
	Habitat ▪ In New Brunswick, southern twayblade grows on bogs, in semi-open areas where the forest grades into the open or treeless centre. It is usually found on mossy hummocks, near or around dwarfed black spruce. ▪ Range: Southern part of License 8. ▪ Southern twayblade has been found at roughly half a dozen sites in New Brunswick.
	Threats to Species and Habitat ▪ Anthropogenic disturbance, alteration of surface runoff, groundwater discharge near wetland and water-table change have been identified as potential direct and indirect effects on the species viability. ▪ Forest management practices (harvest, site prep, Rx fire) present a low-level threat to this species; sites may be seasonally dry yet be impacted by any harvesting of trees (Southern Appalachian Species Viability Project 2002).
	Current Management ▪ AV Group Nackawic do not have a species specific management plan/approach in-place.
	Decision The assessment concluded that the Southern Twayblade is **considered as possible HCV**.

***Scientific Name* / Common Name Status**	**Risk Assessment and Decision**
	▪ Rationale: o No evidence has been found regarding the occurrences of this species within the Freehold.
	Sources ▪ NatureServe Explorer: Danaus plexippus, Monarch (2020), (available at https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.141348/Listera_australis).
Polemonium vanbruntiae Van Brunt's Threatened	**Status Justification** ▪ It is endemic to the central Appalachians, in eastern North America, and is considered at risk throughout its range. The species was evaluated as Threatened by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) in November 2002 and was listed under the same status in Schedule 1 of the Species at Risk Act in January 2005.
	Habitat ▪ Van Brunt Jacob's-ladder is found in wet, open to semi-open, rarely shaded areas that are prone to seasonal flooding (e.g. marshy alder or willow stands, riparian meadows associated with rivers or streams, wet clearings, and basins or depressions with herbaceous vegetation). ▪ The critical habitat for Van Brunt's Jacob's-ladder in Canada is identified in the recovery strategy. Precisely where's suitable habitat within 30 m of each observation point in the ten naturally-occurring extant occurrences. ▪ According to COSEWIC (2002), areas of a sufficient size are available to maintain the species. Due to its ecological adaptability, it can colonize various wet habitat types, some anthropogenic, such as moist fallow fields and logging road ditches. Habitat does not appear limiting in New Brunswick as there is much unoccupied habitat within the southwestern New Brunswick range of the species with characteristics similar to occupied sites.
	Threats to Species and Habitat ▪ The main threat to Van Brunt's Jacob's-ladder is habitat loss through agricultural activities, forest harvesting, residential development, infrastructure construction and habitat degradation through canopy closure or activities such as the use of all-terrain vehicles.
	Current Management ▪ A recovery strategy for the Van Brunt's Jacob's-ladder in Canada is in placed. It is considered technically and biologically feasible that the population distribution is to be maintain in terms of size and area of occupancy for all naturally-occurring extant occurrences in Canada. ▪ AV Group Nackawic do not have a species specific management plan/approach in-place.
	Decision The assessment concluded that the Van Brunt's Jacob's-ladder is **not considered as HCV**. ▪ Rationale: o Known occurrences are outside of the Freehold.
	Sources ▪ COSEWIC 2002. COSEWIC assessment and update status report on the van Brunt's Jacob's-ladder Polemonium vanbruntiae. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vi + 22 pp. ▪ Environment Canada. 2012. Recovery Strategy for the Van Brunt's Jacob's-ladder (Polemonium vanbruntiae) in Canada, Species at Risk Act Recovery Strategy Series, Environment Canada, Ottawa, iv + 26 pp.

The following species are known to exist or likely to frequent and/or live in New Brunswick. Even though they were considered in the process of this assessment it was chosen to not include them in the above listing. Those species are not being impacted by forestry activities, are not to be found in the DFA, or are transient species.

If one of the following species is discovered on the Freehold or its surround, the HCV report review process will act as the company guard to prevent operations impede on the value.

Lichens

Blue Felt Lichen (Degelia plumbea)

Boreal Felt Lichen (Erioderma pedicellatum) Atlantic population

Vole Ears (Erioderma mollissimum)

Table 7. AVG Freehold species at risk

Name		Taxonomy	Conservation Status			Rating
Common Name	Scientific Name	Species Group	NatureServe Global Status	COSEWIC Federal Status	NB Provincial Status	AVG Freehold
Bald Eagle	*Haliaeetus leucocephalus*	Birds	G5	-	Endangered	1
Canada Warbler	*Wilsonia canadensis*	Birds	G5	Special Concern	Threatened	1
Chimney Swift	*Chaetura pelagica*	Birds	G4	Threatened	Threatened	2
Common Nighthawk	*Chordeiles minor*	Birds	G5	Threatened	Threatened	2
Olive-sided Flycatcher	*Contopus cooperi*	Birds	G4	Threatened	Threatened	1
Peregrine falcon	*Falco peregrinus*	Birds	G4	Endangered	Endangered	2
Rusty blackbird	*Euphagus carolinus*	Birds	G4	Special Concern	Special Concern	1
Whip-poor-will	*Caprimulgus vociferus*	Birds	G5	Threatened	Threatened	2
Wood thrush	*Hylocichla mustelina*	Birds	G4	Threatened	Threatened	2
Black Ash	*Fraxinus nigra*	Plants	G5	Threatened	-	1
Butternut	*Juglans cinerea*	Plants	G3	Endangered	Endangered	1
Pinedrops	*Pterospora andromedea*	Plants	G5	-	Endangered	2
Southern Twayblade	*Listera australis*	Plants	G4	Endangered	Endangered	2
Canada Lynx	*Lynx canadensis*	Mammals	G5	-	Endangered	2

Little Brown Myotis	***Myotis lucifugus***	Mammals	G3	Endangered	Endangered	1
Northern myotis	***Myotis septentrionalis***	Mammals	G3	Endangered	Endangered	1
Tri-colored bat	***Perimyotis subflavus***	Mammals	G3	Endangered	Endangered	1
Snapping Turtle	***Chelydra serpentine***	Reptiles	G5	Special Concern	Special Concern	1
Wood Turtle	***Glyptemys insculpta***	Reptiles	G3	Threatened	Threatened	1

Decision:

- Species at risk could occur within the DFA. In order to address this potential HCV, the company implements a Forest Management Plan (FMP) following provincial laws, regulations and Best Management Practice (BMP).

Table 7 shows species at risk as indicated on AVG Freehold Landbase that are considered for HCV. The rating of 1 is given to species known to be on land base, rating of 2 indicates the species might be in vicinity due to ecological habitat, but there are no known records of its presence. Therefore, presence is assessed as unlikely.

Assessment:

AVG use a combination of iNaturalist, Nature Serve Explorer, AVG ground collection data and DNRED ground collection data to determine potential HCV for SAR.

4.1.2. Question 2) Does the forest contain endemic species?

Assessment:

The objective of this question is to ensure the maintenance of vulnerable or irreplaceable elements of biological diversity. Endemic species are those that occur in a particular area and nowhere else. Many of Canada's national endemic species have restricted ranges, which makes them particularly vulnerable to habitat loss, climate change and invasive species.

Characteristic mammals include moose (Alces alces), black bear (Ursus americanus), red fox (Vulpes vulpes), snowshoe hare (Lepus americanus), porcupine (Erithyzon dorsatum), fisher (Martes pennanti), beaver (Castor canadensis), bobcat (Lynx rufus), marten (Martes americana), muskrat (Ondatra zibethica), and raccoon (Procyon lotor), although some of these species are less common in the southern parts of the ecoregion. White-tailed deer (Odocoileus virginianus) have expanded northward in this ecoregion and displaced the woodland caribou (Rangifer tarandus ssp. caribou) from the northern parts of the ecoregion. Coyotes (Canis latrans) have recently replaced wolves, which were eradicated from this ecoregion in historical times.

To support the conservation of Canada's endemic wildlife, the Nature Conservancy of Canada (NCC) and NatureServe Canada have developed a comprehensive report[a] on this group of uniquely Canadian wildlife. It highlights over 300 of Canada's nationally endemic plants and animals and maps hot spots across the country where they can be found. Currently only 10% of Canada's endemic species are have been ranked by NatureServe as globally secure or apparently secure. Almost one-third of Canadian endemic species do not have sufficient information to assign national ranks or have continued taxonomic uncertainty. Further study on these "potential endemic" species to develop conservation status ranks and facilitate future national and global assessments is a high priority.

According to Nature Conservancy of Canada and NatureServe Canada (2020), the province of New Brunswick contains 17 endemic species. Over half of the nationally endemic species from New Brunswick are vascular plants and butterflies. Most of the endemic species that occur in New Brunswick are associated with coastal marshes along the Gulf of St. Lawrence. Due to its shared ecoregions with Quebec and Nova Scotia, there is only one endemic species restricted to New Brunswick.

> The Rove Beetle (Mitosynum vockerothi) has been collected from only three sites in New Brunswick, including where it was originally discovered along the edge of a sphagnum bog in Kouchibouguac National Park.

[a] Amie, Dan Kraus and Andrea Hebb. 2020. Ours to save: the distribution, status and conservation needs of Canada's endemic species. NatureServe Canada and Nature Conservancy of Canada)

- Campbell, J. M. (1982). Mitosynum vockerothi, A new genus and new species of Coleoptera (Staphylinidae: Oxytelinae) from Eastern Canada. The Canadian Entomologist, 114(8), 687-691. doi:10.4039/Ent114687-8

Three species of butterflies are considered endemic in NB: Maritime Ringlet (Coenonympha nipisiquit), Salt Marsh Copper (Lycaena dospassosi) and Short-tailed Swallowtail (Papilio brevicauda bretonensis). Global ranges of these species are limited to a handful of salt marshes, coastal marshes, dunes and headlands of New Brunswick.

- Klymko, J., 2015. Maritimes Butterfly Atlas Targeted surveys and general operation.
- John Klymko, Jim Edsall, and Sarah Robinson. They are based primarily on Butterflies of Canada (Layberry et al., 1998) and Butterflies of North America (Scott, 1986).

New Brunswick also includes a significant portion of the range for Maritime Shrew (Sorex maritimensis). The population of this species may be declining due to changes in its habitat. Maritime Shrew only occurs in New Brunswick and Nova Scotia.

- Reid, F. (2016). Sorex maritimensis. The IUCN Red List of Threatened Species 2016. Retrieved from http://dx.doi.org/10.2305/IUCN.UK.2016-2.RLTS.T136779A22312357.en.

The global range of Gulf of St. Lawrence Beach Pinweed (Lechea maritima var. subcylindrica) is restricted to the sand dunes of New Brunswick and the northern coast of PE.

- Environment Canada. (2013). Management Plan for the Beach Pinweed (Lechea maritima) in Canada. Ottawa: Environment Canada

The Labrador Duck is believed to be Extinct since 1875. Designated in April 1985 based on historic records only.

- Chilton, G. (1997). Labrador Duck (Camptorhynchus labradorius). In The Birds of North America (pp. 12).

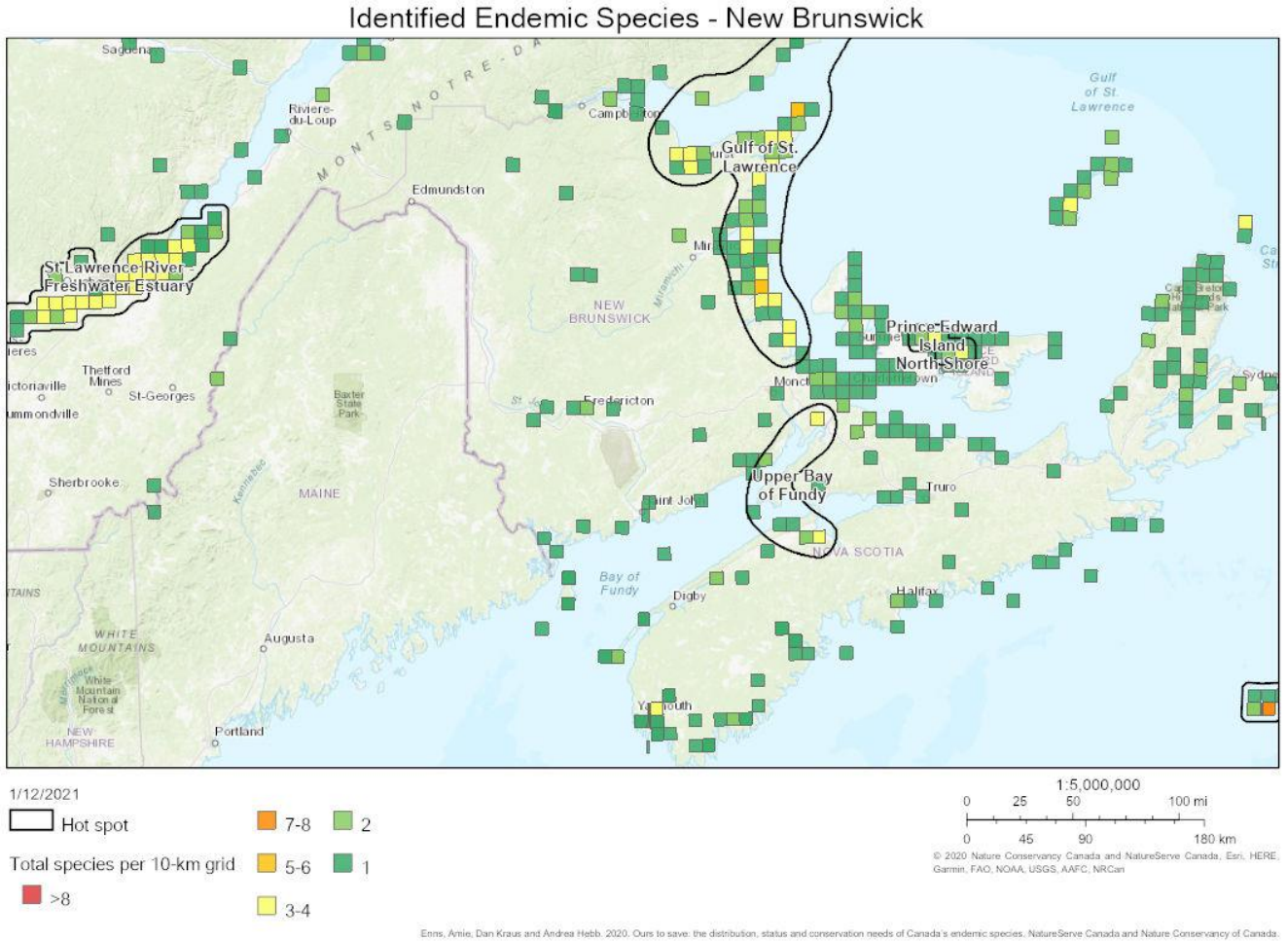
Refer to Table 7 for more details on New Brunswick endemic species.

The interactive map of Canada provide location of all documented occurrences of species and hot spots: Ours to Save - Explore (arcgis.com).

Decision:

- Endemic species occurs in New Brunswick. But for now, there is no evidence to suggest there are concentrations of endemic species within the DFA. The company will keep on with his self awareness on this aspect within the DFA.
- No HCV.

The number of wildlife species are shown per ecoregion and 10 x 10 km grid.



The number of wildlife species are shown per ecoregion and 10 x 10 km grid.

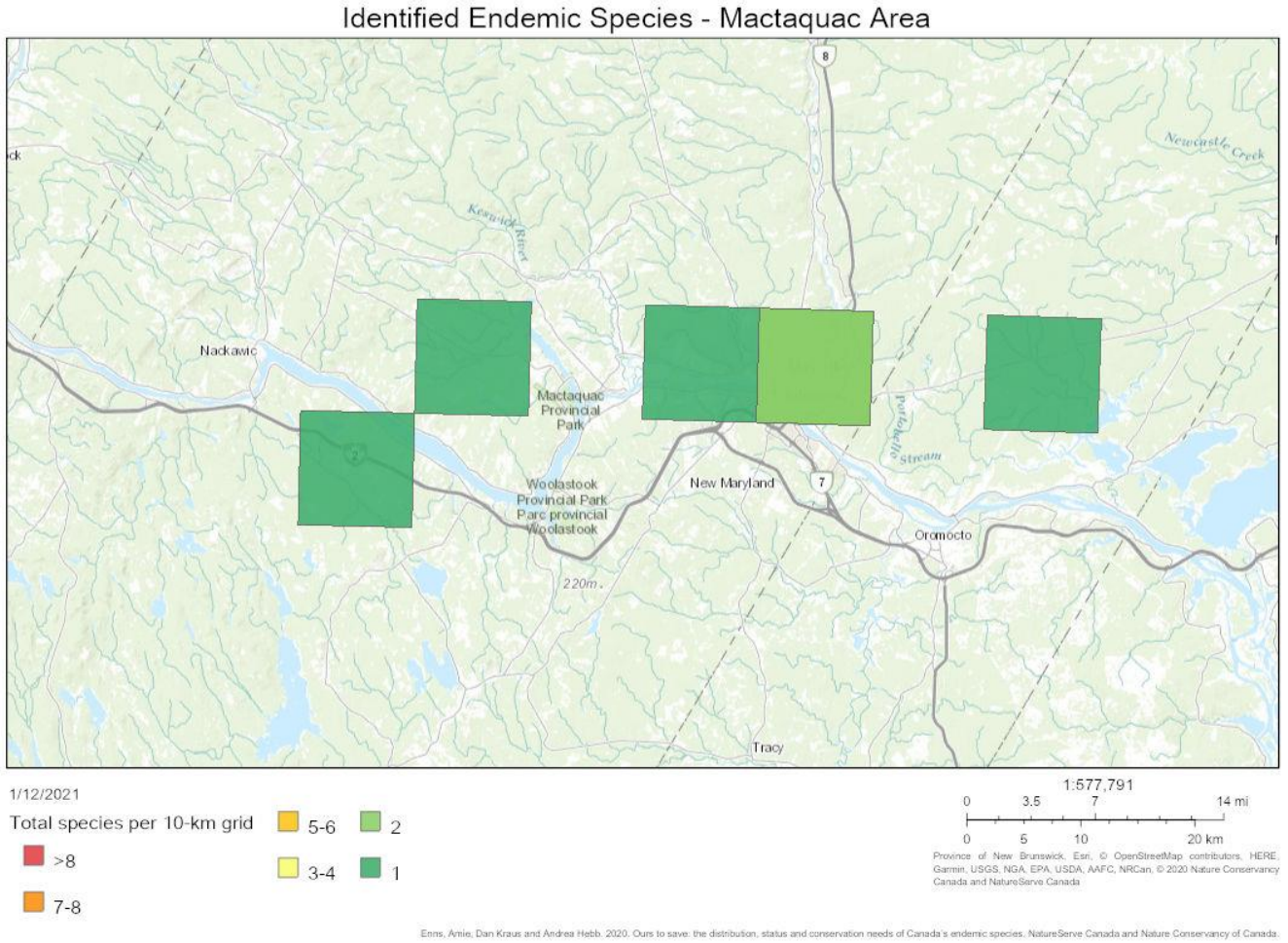


Table 8. New Brunswick Endemics List – As of June 4, 2020[a].

Endemism Type	Taxonomy Group	Scientific Name	English Name	Comments Prepared by Amie Enns of NatureServe Canada	Distribution in Canada
National endemic	Dicots	Amelanchier fernaldii	Fernald's Serviceberry	*National endemic, known from New Brunswick, Newfoundland, Nova Scotia, Prince Edward Island, and Quebec (FNA vol. 9, 2014).*	NB, NF, NS, PE, QC
National endemic	Dicots	Atriplex franktonii	Frankton's Saltbush	*National endemic, known only from New Brunswick and Nova Scotia.*	NB, NS, PE
National breeding endemic	Birds	Camptorhynchus labradorius	Labrador Duck	*Camptorhynchus labradorius probably bred along the Gulf of St Lawrence and coastal Labrador, Canada, wintering from Nova Scotia south to Florida, USA (Gourdin 2009). The last confirmed specimen was collected off Long Island, New York, in 1875 (Chilton 1997), or possibly 1878 (Madge and Burn 1988).*	LB, LB, NB, NB, NF, NF, NS, QC
National endemic	Tiger Beetles	Cicindela repanda novascotiae	Nova Scotia Tiger Beetle	*National endemic, restricted to New Brunswick, Nova Scotia, P.E.I. and Quebec.*	NB, NS, PE, QC
National endemic	Butterflies and Skippers	Coenonympha nipisiquit	Maritime Ringlet	*National endemic, known only from the Baie des Chaleurs and Gaspesie between New Brunswick and Quebec.*	NB, QC

[a] From database of national and potential endemic species: Enns, Amie, Dan Kraus and Andrea Hebb. 2020. Ours to save: the distribution, status and conservation needs of Canada's endemic species. NatureServe Canada and Nature Conservancy of Canada

Endemism Type	Taxonomy Group	Scientific Name	English Name	Comments Prepared by Amie Enns of NatureServe Canada	Distribution in Canada
National endemic	Conifers	Juniperus communis var. megistocarpa	Magdalen Islands Juniper	*Nationally endemic, known from Newfoundland, Nova Scotia, and Quebec.*	NB, NS, QC
National endemic	Dicots	Lechea maritima var. subcylindrica	Beach Pinweed	*Nationally endemic, restricted to stabilized sand dunes within localized areas of coastline in eastern New Brunswick and northern Prince Edward Island (COSEWIC 2008).*	NB, PE
Subnational endemic	Ants, Wasps, and Sawflies	Leptothorax sphagnicola	Peat Moss Thin Ant	*National endemic, known from Quebec and New Brunswick. It is noted in the Ants of New England but has not been found there to date (Rob Higgins, pers. comm., 2018).*	NB, QC
National endemic	Butterflies and Skippers	Lycaena dospassosi	Salt Marsh Copper	*National endemic, known from all 3 maritime provinces (New Brunswick, Nova Scotia, and Prince Edward Island) and the Gaspé Peninsula of Quebec.*	NB, NS, PE, QC
Subnational endemic	Other Beetles	Mitosynum vockerothi	Rove Beetle	*Endemic to New Brunswick. 12 specimens from 3 sites in 3 counties in NB; The collections in NB are the only localities that this species has been collected in; thus these sites are of global significance in terms of this species (Webster et al.).*	NB
National endemic	Butterflies and Skippers	Papilio brevicauda bretonensis	Short-tailed Swallowtail	*National endemic, known from New Brunswick and Nova Scotia.*	NB, NS, QC

Endemism Type	Taxonomy Group	Scientific Name	English Name	Comments Prepared by Amie Enns of NatureServe Canada	Distribution in Canada
Subnational breeding endemic	Birds	Passerculus sandwichensis princeps	Ipswich Sparrow	*Breeding endemic, known only from Nova Scotia.*	NB, NS, ON, PE
National endemic	Freshwater Mussels	Pyganodon fragilis	Newfoundland Floater	*National endemic, known from Labrador, Newfoundland Island, Nova Scotia, and Quebec.*	LB, NB, NF, QC
National endemic	Dragonflies and Damselflies	Somatochlora septentrionalis	Muskeg Emerald	*National endemic, known from Alberta, British Columbia, Labrador, Manitoba, New Brunswick, Newfoundland, Nova Scotia, the Northwest Territories, Ontario, Saskatchewan, and Yukon.*	AB, BC, LB, MB, NB, NF, NS, NT, ON, QC, SK, YT
National endemic	Mammals	Sorex maritimensis	Maritime Shrew	*National endemic, known only from a small range in Nova Scotia and New Brunswick. Probably in Maine, but in the meantime considered endemic (John Klymko, pers. comm 2016).*	NB, NS
National endemic	Dicots	Symphyotrichum laurentianum	Gulf of St. Lawrence Aster	*Nationally endemic, known only from the southern shores of the Gulf of St. Lawrence in Quebec, New Brunswick, and Prince Edward Island (FNA vol. 20, 2006).*	NB, PE, QC
National endemic	Dicots	Symphyotrichum novi-belgii var. crenifolium	Gaspé Aster	*National endemic, known from New Brunswick, Nova Scotia, and Quebec.*	NB, NS, QC

Endemism Type	Taxonomy Group	Scientific Name	English Name	Comments Prepared by Amie Enns of NatureServe Canada	Distribution in Canada
National endemic	Other Bees	Triepeolus brittaini	Brittain's Cuckoo Nomad Bee	*National endemic, known only from New Brunswick, Nova Scotia, and Prince Edward Island (Wild Species report, 2015). Bee expert Cory Sheffield does not list P.E.I. in the range (Cory Sheffield, pers. comm., 2018).*	NB, NS, PE
National breeding endemic	Birds	Zonotrichia querula	Harris's Sparrow	*Canadian breeding endemic, known from Alberta, Manitoba, the Northwest Territories, Nunavut, Ontario, and Saskatchewan. Accidental in New Brunswick, Newfoundland, Nova Scotia, P.E.I., Quebec, and Yukon.*	AB, BC, MB, MB, NB, NF, NS, NT, NU, NU, ON, PE, QC, SK, YT

4.1.3. Question 3) Does the forest include critical habitat containing globally, nationally or regionally significant seasonal concentration of species (one or several species, e.g. concentrations of wildlife in breeding sites, wintering sites, migration sites, migration routes or corridors - latitudinal as well as altitudinal)?

Assessment:

Many species use a variety of habitats at different times of the year or at different stages in their life-history. These may include seasonal breeding sites, migration routes or corridors (latitudinal as well as altitudinal). These critical concentrations will often occur seasonally (e.g. winter feeding grounds or summer breeding sites). Seasonal and ecological refuges which provide temporary breeding, roosting, hibernation, migration sites or habitats essential for rare, threatened or endangered species qualify for HCV 1.

The protection of critical habitat is covered in section 58 of the Species at Risk Act of New Brunswick. Subject to this section, no person shall destroy any part of the critical habitat of any listed endangered species or of any listed threatened species -- or of any listed extirpated species if a recovery strategy has recommended the reintroduction of the species into the wild in Canada – if

> (a) the critical habitat is on federal land, in the exclusive economic zone of Canada or on the continental shelf of Canada;
>
> (b) the listed species is an aquatic species; or
>
> (c) the listed species is a species of migratory birds protected by the Migratory Birds Convention Act, 1994.

Conservation project, NGO and governmental agency databases were use for the assessment of 4.1.3.

<u>BirdLife International</u>

- Sources:
  - Devenish, C., Díaz Fernández, D. F., Clay, R. P., Davidson, I. & Yépez Zabala, I. Eds. (2009) Important Bird Areas Americas - Priority sites for biodiversity conservation. Quito, Ecuador: BirdLife International (BirdLife Conservation Series No. 16)
  - BirdLife International (2006) Monitoring Important Bird Areas: a global framework. Cambridge, UK. BirdLife International. Version 1.2.
  - Birds Canada: Canadian Important Bird Areas (ibacanada.com)

In Canada, Important Bird Area (IBA) have been used to design conservation reserve networks, and to prioritize lands for acquisition. They have also been used by governments in assessing impacts and establishing guidelines for proposed development projects. An IBA provides essential habitat for one or more species of breeding or non-breeding birds. It may contain threatened species, endemic species, species representative of a biome, or highly exceptional concentrations of birds. At the national level, IBA monitoring is essential to track and respond to threats,

understand the status and trends of biodiversity, and assess the effectiveness of conservation efforts.

At the provincial scale, there are 27 identified IBAs. They may encompass private or public land, and they may overlap partially or entirely with legally protected sites. Although there are many areas important to birds in the DFA, none fulfilling the requirements of an "IBA" has been identified by BirdLife International (2019) or Birds Canada (2020). The nearest IBA of the DFA is the Lower St. John River (Sheffield / Jemseg). The Lower Saint John River site, located in south-central New Brunswick, extends 25 km along the St. John River, from 5 km northeast of the town of Oromocto to 25 km east of Oromocto. The site includes the Portobello National Wildlife Area, Gilbert Island, French Lake, Big Timber Lake, Grand Lake Meadows, and the southern edge of Grand Lake. The area is under tidal influence (tidal influence extends upstream to Mactaquac dam); extensive spring flooding have resulted in the creation of a unique hardwood and flora complex creating the single largest wetland complex in Atlantic Canada. Habitats here include marshy islands, backwaters, creeks and marshes that extend 2 to 5 km beyond the main riverbanks. With its extensive marshes and backwaters, the Lower Saint John river provides breeding habitat for the nationally vulnerable Yellow Rail. Due to the rails secretive nature, and the inaccessibility of much of the site, their precise numbers are not known. However, it is estimated that the population contains at least 100 birds, which is over 1% of their North American population. The area is still the largest breeding concentration in the northeast, with perhaps over 100 birds being present. These numbers are nationally significant, since they probably are equal to 1% of the Canadian population. The region supports Atlantic Canadas only breeding population of Greater Scaup. Thousands of waterfowl use this site during migration. Total numbers of staging species may occasionally approach 10,000 which is nationally significant.

Duck Unlimited

- Sources:
  - New Brunswick Archives — Ducks Unlimited Canada. (accessed January 11, 2021; https://www.ducks.ca/region/new-brunswick/)

Ducks Unlimited Canada works closely with provincial government agencies to ensure that critical habitats for migrating and breeding waterfowl are conserved. Across Atlantic Canada, DUC manages more than 52,000 acres of wetlands and 550 water controls and dykes. 160 of these projects are equipped with fishways to help fish pass in and out of wetlands. DUC will rebuild key projects on an annual basis so that these habitats continue to sustain waterfowl, fish and other wildlife. Protecting wetlands before they're altered or destroyed is the ideal conservation measure. This is best achieved through wetland conservation policies and regulations. DUC recognized that wetlands in New Brunswick provide critical habitat for millions of migrating waterfowl. New Brunswick's wetlands and coastal areas support waterfowl from as far south as the Caribbean to as far north as the sub-Arctic. They supply birds

with a place to nest and raise their young. All Maritime provinces have strong policies that support wetland conservation.

Provincially Significant Wetlands and Waters Management and Protection

- Sources:
  - List of Provincially Significant Wetlands (April 2020; https://www2.gnb.ca/content/dam/gnb/Departments/env/pdf/Wetlands-TerreHumides/ListOfProvinciallySignificantWetlands.pdf)
  - WAWA Reference Map (snb.ca)
  - Watercourse Alterations Technical Guidelines (January 2012): Appendix A: Freshwater Habitats and Behavioural Patterns of Some Notable Aquatic Species of New Brunswick.

As of January 1st, 2020, the Department of Environment and Local Government has released data on watercourse and wetland locations in New Brunswick. AVN use these as their main reference in their planning process. This new reference map tool is an updated version of the previous wetland map and intended to provide better information for the Watercourse and Wetland having provincial, national or international importance for one or more of the following reasons (criteria). These are considered Provincially Significant (NB Wetlands Conservation Policy, 2002):

1. Wetlands, such as coastal marshes, which represent a remnant of a formerly more widespread wetland type where, historically, impacts to this habitat type have been severe.
2. Wetlands that are within a designated Ramsar site, National Wildlife Area, Provincial Wildlife Management Area, Migratory Bird Sanctuary, Western Hemisphere Shorebird Reserve Network site, Ecological reserve, Protected Natural Areas.
3. Wetlands that are project sites under the North American Waterfowl Management Plan and secured for conservation through the Eastern Habitat Joint Venture.
4. Wetlands that contain one or more Endangered and/or Regionally Endangered Species as designated under the New Brunswick Endangered Species Act; or, other species of special status.
5. Wetlands that represent a significant species assemblage and/or have a high value for wildlife on the basis of size, location, vegetation, diversity or interspersion.
6. Wetlands that have a significant hydrologic value including flood control, water quality protection, recharge or discharge of groundwater.
7. Wetlands that have, or are managed for, social and/or cultural values, including, but not limited to, community, spiritual, archaeological, scientific, educational, and recreational importance.

There are many waterways in the forest that have not been surveyed for spawning sites, and for this reason a precautionary approach is used to ensure streams and lakes receive adequate protection. These areas do not qualify as HCVs under this question, according to the HCVF Framework in the FSC Standard, because a high

degree of protection is afforded routinely through the Watercourse and Wetland Alteration Regulation (under the authority of New Brunswick Clean Water Act). The New Brunswick Department of Environment acts as the regulatory body, responsible for processing and issuing all Watercourse and Wetland Alteration Permits.

Decision:

- Critical habitat occurs in New Brunswick. But for now, there is no evidence to suggest there are significant concentrations of species within the DFA.
- No HCV

4.1.4. Question 4) Does the forest contain critical habitat for regionally significant species (e.g. species declining regionally)?

Assessment:

Wildlife Habitat

The FMP provides habitat for many species whose habitat is managed according to directions of NB DNRED.

Depending on the type of forest habitat (e.g. Old Forest Community), occurrences of known wildlife habitat (e.g. Old Forest Wildlife Habitat) or value (e.g. Raptor nest), conservation areas (e.g. Deer Wintering Area), ecological values and aquatic habitat, measures such as timing restrictions on forest management activity, no harvest zones, or no road zones are implemented. The site-specific habitats subject to concerns are:

- Species at risk
- Rare species
- Stick-nesting birds (e.g. Bald Eagle, Osprey, hawks, owls, Great Blue Heron)
- Cavity nesting sites
- Beavers
- Dens (e.g. bear, wolf, etc.)
- Moose habitat
- Fish habitat

Forest habitat management is about supplying forest conditions in particular locations at particular times. In New Brunswick, it functions as a component of a larger strategic planning process for multiple forest values that is applied at a large spatial extent and over a long-time horizon. Old-forest habitats were identified and defined by the province based on the requirements of the species that utilize them. The resulting 6 old-forest habitats are Old Tolerant Hardwood (OTHH), Old Hardwood (OHWH), Old Spruce-fir (OSFH), Old Pine (OPIH), Old Mixedwood (OMWH) and Old Forest (OFH). Priority was given to the 38 species that meet the criteria of being relatively common, of not also having their needs met in mid-age

forest, and of not requiring that forest be in close proximity to other habitat classes, such as non-forested uplands, wetlands and watercourses. Habitat relationships of species associated with old forest (NB ERD November 2017), young-forest (NB ERD April 2017) and wetland and coastal habitats (NB ERD 2017) are described in by the Department of Energy and Resources Development.

St. John River Hardwood Forest

St. John River Valley Hardwood Forest (SJRHF) assemblages contain a number of species that are listed as uncommon, rare, very rare, threatened, or endangered within New Brunswick, Maine, the Maritime provinces, or even the Gulf of St. Lawrence region. These species include up to 31 vascular plants. Refer to the document Natural History of the Saint John River Valley Hardwood Forest of Western New Brunswick and Northeastern Maine.

Basswood, butternut, American elm, and hemlock are also observed in many stands, and the first two species in this latter group are usually good indicators of the presence of species-rich understorey assemblages. The assessment team believes that focusing on the Butternut will benefits to the HCV assessment process since its decline is confirmed (COSEWIC 2003) and it is recognized as an indicator of SJRHF flora. Butternut canker, which has caused high rates of infection and mortality in the United States, has been detected in all three provinces where it is naturally occurring. In N.B. butternut is common and native in the Saint John River Valley. It is scattered throughout the Grand Lake Ecoregion on flood plain soils and is a common component of field hedgerows. A number of extensive pure stands occur on several flood plain islands. Butternut is also scattered throughout the upland hardwood forest in the Meductic Ecodistrict (Valley Lowlands Ecoregion), which is underlain with rich calcareous soils. A majority of land within the butternut range in N.B. is under private ownership. Although there are no guidelines specific to management of butternut in N.B., watercourse buffer zone guidelines for Crown Land forestry activities, which limit extent and type of forest overstory removal along watercourses on Crown Lands, might be of some benefit to butternut populations occurring on riparian sites.

In New Brunswick, butternut occurs in the following protected areas: Grand Lake Meadows Protected Natural Area, Hal Hinds Forest, near Woodstock (N.B. Dept. Nat. Res. and Energy); Meduxnekeag River Preserve; Maquapit Lake; Sugar Island, (St. John River). The latter two are administered by the Nature Trust of New Brunswick.

Given that almost all of these species are strongly associated with mature SJRHF stands, the continued loss of SJRHF in the central St. John River Valley threatens their long-term persistence within their current range in northern Maine and the Maritimes.

Provincially Significant Wetlands

New Brunswick recognized that wetlands perform many important functions, such as maintaining ecosystem health and provide habitats, food and nutrients for many species, providing habitat for Endangered Species and other species of special status and important repositories for biodiversity. The Saint John River floodplain wetlands are the most productive and extensive of our inland freshwater wetlands. They perform an essential function in storing floodwater during spring freshet. These wetlands are threatened by urban, industrial and agricultural runoff; sedimentation; human encroachment; and recreational use. (New Brunswick Wetlands Conservation Policy, July 2002)

Decision:

- Ecosites associated with St. John River Hardwood has been considered an HCV. However, we believe it is more appropriate to assess the SJRHF under the HCV 3 section.
- No HCV

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

Assessment:

The range of species distribution was assessed via COSEWIC's Canadian Wildlife Species at Risk (2020) and IUCN Red List of Threatened Species. We also used the General Status of Wild Species which is an assessment of more than 2300 of New Brunswick's birds, mammals, fish, reptiles, plants, insects, shellfish and other wild species. It identifies which are doing well – and which require greater management or conservation measures. Assessments are ongoing – and part of a cooperative effort with other provincial, territorial and federal wildlife departments.

The DFA resides within the New England-Acadian forest terrestrial ecoregion. This ecoregion covered approximately 50 percent of New Brunswick. Due to the transition to Eastern Canadian forest (North), to the Eastern Great Lakes lowland forests (West) and the Gulf of St. Lawrence lowland forests (East), the acadian forest is potentially the home of several species at the edge of their natural ranges, especially for plants. There are numerous Atlantic coastal plain plant species at their northern limits and the northeastern limits of several deciduous tree species and forest communities with southern affinity can also be found within the ecoregion. Typical of the transitional nature of this ecoregion, the southernmost outliers of arctic vegetation in eastern North America also occur.

AVN has objectives to maintain levels of specific vegetation communities. They are grouping of forest ecosystems that possess uniformity in species composition (all plants), arrangement, or condition. These communities are created to preserve older

successional stages for biodiversity purposes. The 2008 vegetation communities were assigned using photo interpreted stand attributes. Vegetation community patches were based on crown closure, development stage and patch area. A GIS coverage was created from an algorithm received from DNR that links stands to vegetation communities. These values limit the type and intensity of harvest within these landbases. In forest ecosystems are represented by aggregations of forest stands in the management planning process. (2008-2032 AVN Freehold FMP)

In New Brunswick, forest ecosystems are further protected using a fine-filter approach of preserving sites of high or unique ecological, historical, cultural or scenic value. This objective may be further enhanced through the Protected Areas Strategy still under development by government. (NB DNRE 2000)

Range limits associated with the southern and northern species of the Acadian forest are dealt with throughout the various categories of vegetation communities and Old Forest Community. Old Forest Communities and Old Forest Wildlife Habitats are managed to ensure a full variety of healthy and resilient native forested ecosystems and a full range of native forest associated species are present and sustainable across their ranges.

In order to identify potential species at the edge of their ranges we've also reviewed specie ranked as "Undetermined" and "Accidental" in the General Status of Wildlife Species classification process. According to the NB NRED, the "Undetermined" status is for species for which there is insufficient data, information, or knowledge available to reliably evaluate their general status. These are usually species for which there are few documented occurrences in New Brunswick. Some of these species appear to be just establishing populations in the province, and it is difficult to determine whether these are long-term expansions or not. Others are obscure species, either because of their behaviour or because of their size and inaccessible habitat. It is possible that these species have larger populations or wider distributions than are suggested by our current level of information. "Accidental" status is for species occurring infrequently and unpredictably outside their usual range. This includes species that are accidental and not expected to return; occasional vagrants; and those that may appear most years or even every year but are rare and unpredictable. If breeding has been recorded, it is extremely rare and does not occur in most years.

Decision:

- Species at the edge of their natural ranges occurs in New Brunswick. But for now, there is no evidence to suggest there are significant concentrations of these species within the DFA. The company will keep on with his self awareness on this aspect. Therefore, there is no HCV addressed under this section.
- No HVC

4.1.6. Question 6) Does the forest lie within, adjacent to, or contain a conservation area?

Assessment:

4.1.6.1. Conservation area designated by an international authority

UNESCO World Heritage Sites

The United Nations Educational, Scientific and Cultural Organization (UNESCO) has not identified World Heritage Sites in New Brunswick, neither in adjacent area of the DFA (e.g. Maine (US)).

RAMSAR sites

Canada currently has 37 sites designated as Wetlands of International Importance (Ramsar Sites), with a surface area of 13,086,767 hectares. New Brunswick add one of them: The Tabusintac Lagoon & River Estuary (4,997 ha) which is located in the provincial county of Northumberland. However, this site is more than 200 km of the DFA and thus outside of the scope of this assessment.

4.1.6.2. Conservation area legally designated or proposed by relevant legislative body

Federal

In Canada, national parks are owned and operated by Parks Canada, a division of the National government. New Brunswick have 2 national parks: Fundy National Park and Kouchibouguac National Park. Fundy National Park is located on the Bay of Fundy, a bay world-renowned for its high tides. It covers 20,600 hectares and content hiking trails and outdoor recreational facilities. Kouchibouguac National Park is a 23,800 hectares park on the east coast of New Brunswick. Highlights of this park include forests, sheltered lagoons, and sand dunes. However, these parks are outside the scope of this assessment due to their great distance from the DFA.

Provincial

In New Brunswick, there are two classes of Protected Natural Areas (PNA) where different restrictions apply. The majority of the Protected Natural Areas were designated as Class II sites. They protect good examples of the province's natural ecosystems and landscapes. Low impact recreational activities and traditional food gathering activities are permitted. These sites provide an opportunity to study the natural environment as well as the recovery of modified ecosystems. The more restrictive Class I designation is reserved for sites that host plant or wildlife species that are deemed too sensitive to sustain disturbance. They are nature reserves that are legally protected under the Protected Natural Areas Act. Thirty of these areas had been previously protected as conservation areas or ecological reserves and were then converted to the Protected Natural Areas status. Forests in PNA are allowed to grow old and maintain primeval characteristics such as standing dead trees, or large

decaying trunks on the forest floor. Plus, there is two main types of conservation areas for which the province is responsible: designated conservation forest (e.g. deer wintering areas, other habitats) and special management area (e.g. wildlife management areas).

Terrestrial conserved and protected areas include land and freshwater. According to the Canadian Environmental Sustainability Indicators (CESI) database there is 5 Terrestrial protected natural areas intersecting with the DFA. These are the following:

- Oak Mountain (93.07 ha)
- Mill Stream-Mactaquac (394.2 ha)
- Risteen Brook (247.9 ha)
- Skiff Lake (479.2)
- Woodman (776.7)

Also, 3 areas have been established by AVN and are protected within the DFA. These are the following:

- Pokiok Park (252.3 ha)
- Flat Top Mountain (68.3 ha)
- Nackawic Cross Country Trails (176.5 ha)

Also, provincial parks are dedicated to permanently protect ecosystems, biodiversity and the elements of natural and cultural heritage, provides opportunities for recreational, educational, promotional and tourism activities. Nearby the DFA, the Mactaquac Provincial Park (525 ha) is a broad woodland and recreation complex along the Saint John River.

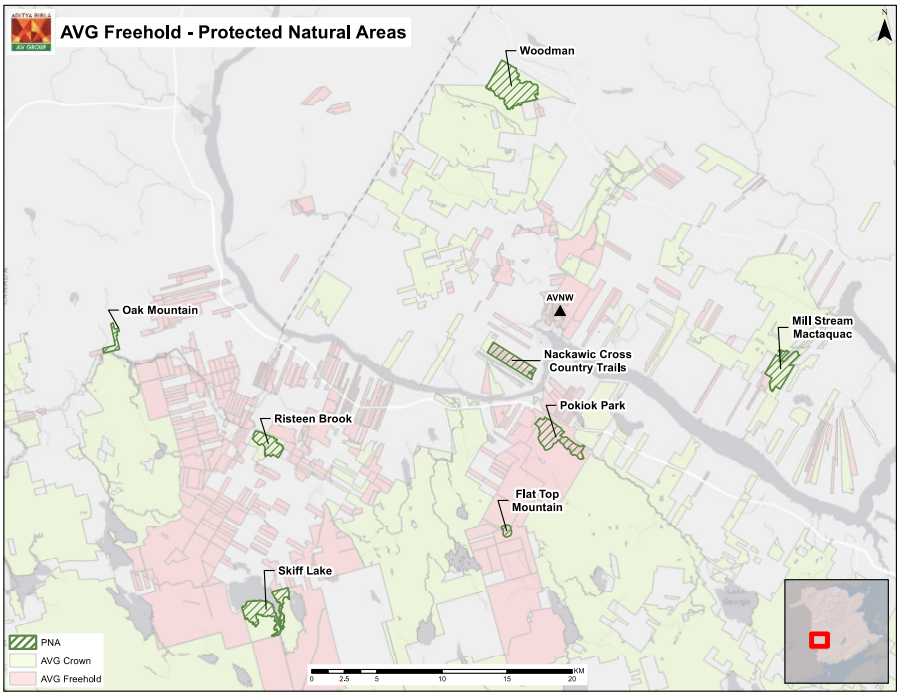


Figure 1. Map of New Brunswick protected areas network, which demarcates both provincial and federal protected areas. Each protected area corresponds to one of 8 IUCN categories. The map legend defines the IUCN categories as: Category Ia, Category Ib, Category II, Category III, Category IV, Category V, Category VI, and Unclassified. See page 11 for a detailed description of each IUCN category. Source: Conservation Areas Reporting and Tracking System (CARTS) - 2011.12.31.

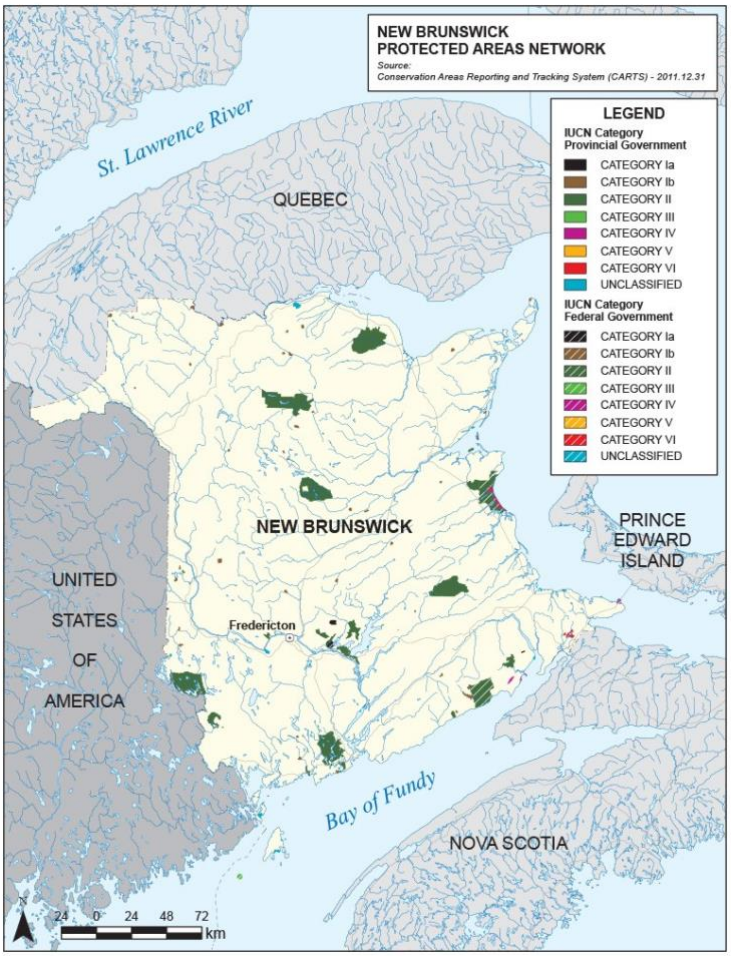


Table 7. New Brunswick Protected Areas Status Report

From Conservation Areas Reporting and Tracking System (CARTS).

Provincially Administered			
IUCN Category	**No. of Protected Areas**	**Area Protected (km2)**	**% of Total**
IUCN Category Ia	4	10.4	0
IUCN Category Ib	41	71.4	0.001
IUCN Category II	20	1 689.2	0.023
IUCN Category III	-	-	-
IUCN Category IV	-	-	-
IUCN Category V	-	-	-
IUCN Category VI	-	-	-

Federally Administered			
IUCN Category	**No. of Protected Areas**	**Area Protected (km2)**	**% of Total**
IUCN Category Ia	2	25	0
IUCN Category Ib	-	-	-
IUCN Category II	2	404.6	0.006
IUCN Category III	1	0.1	0
IUCN Category IV	2	14	0
IUCN Category V	-	-	-
IUCN Category VI	1	19.4	0

Total			
IUCN Category	**No. of Protected Areas**	**Area Protected (km2)**	**% of Total**
All	73	2 234.1	0.031

- Territorial

There are no legally proposed or designated conservation areas relevant to a territorial legislative body.

4.1.6.3. Conservation area identified in regional land use plans or conservation plans

New Brunswick actively manages over 800 deer wintering areas (280 000 hectares) on Crown land. This habitat has the potential to over-winter about 50 000 deer; though fewer than that reside on Crown land today. Wintering areas are key to deer survival in New Brunswick. That is why we the NB NRED require that forestry companies maintain a proportion of the Crown land they manage as habitat to support our white-tail population.

The DWA landbase has been located and mapped, through ground surveys done by AVN staff. The DWA landbase is reviewed every 5 years to allow for any appropriate changes in deer activity. At present, there are 11 individual DWAs identified totalling 842 ha of productive area (509 ha North of the St. John River and 336 ha South of the St. John River).

Decision:

- All existing protected areas within and adjacent to the DFA are considered HCVs.
- Conservation Area, such as DWA, and Vegetation Communities associated with Old Forest Habitat are considered as HCVs.

4.2. HCV 2 – Landscape-level ecosystems and mosaics

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

Assessment:

New-England/Acadian Forest

The Acadian forests is a moderately rich example of temperate broadleaf and mixed forests. The mosaic of forest types and habitats support 225 bird species, making these forests the second-richest ecoregion within the temperate broadleaf and mixed forests, and among the 20 richest ecoregions in the continental United States and Canada. For example, mature northern hardwood stands commonly contain softwoods–usually red spruce, eastern hemlock, or white pine.

The mountains of this region contain a number of forest types; northern hardwoods/spruce forests predominate and comprise roughly half of the forested landscape. Mature stands in many areas originated after extensive fires that were fueled by logging debris in the late 19th century. Fire plays a much less important role in the northern hardwood forests characteristic of this ecoregion, where spring and fall seasons are short, than in the oak-dominated forests of ecoregions further

to the south. Fire probably plays the most important role in forest dynamics of the region. Fires tend to be on the order of 10 to 100 km^2 in New Brunswick although there has been active fire suppression for many decades. Fire can be a crucial factor in areas where red spruce and balsam fir intermingle with the hardwoods. Fire-protection policies led to the decline of many fire-dependent ecosystems.

Intact Forest Landscape

Global Forest Watch (GFW) defines an intact forest landscape as a contiguous mosaic of natural ecosystems in a forest ecozone, essentially undisturbed by human influence, including both treed and naturally treeless areas (Lee et al, 2010). An intact forest landscape must be large enough to contain and support natural biodiversity and ecological processes, and to provide a buffer against human disturbance from surrounding areas. In their Canadian study using high resolution satellite imagery, GFW examined forest tracts of 50,000 hectares or larger that were at least 10 kilometres wide (intact forest landscapes).

There are no identified IFL in New Brunswick.

Decision:

- There are no Intact Forest Landscape in New Brunswick. Therefore, no HCV were assigned for large and intact ecosystem.
- All existing protected areas within and adjacent to the DFA are considered HCVs. Refer to Question 6).
- No HCV.

4.3. HCV 3 – Ecosystems and habitats

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

Assessment:

The central St. John River Valley is home to a type of hardwood forest found nowhere else in Atlantic Canada. Referred to as St John River Hardwood Forest, or Appalachian Hardwood Forest for its similarities to forest types found much further south and west, it contains trees and other plant species rare or uncommon in New Brunswick. Key tree species include basswood, white ash, ironwood, and butternut, usually in stands with sugar maple, yellow birch, often black cherry, and other tolerant hardwoods. Rare or uncommon understorey plants include showy orchis, maidenhair fern, wild ginger, black raspberry, wild coffee, yellow lady's slipper, Goldie's fern, Canada violet, blue cohosh, and a number of others.

It is estimated that SJRHF once occupied at least 200,000 hectares within New Brunswick's central St. John River Valley, based on the topography and distribution of well-drained calcareous soils within the region (MacDougall 1997). This figure

increases when eastern Aroostook County is included, though the exact quantity of suitable habitat there is unknown. This pre-European forest would have been mostly continuously distributed, occupying the well-drained bottomland areas and flat and gently-sloped uplands within the valleys of the region. Only 0.8% of the area deemed suitable for SJRHF actually supports mature hardwood forests. Fifty-five percent of the remaining land base is permanently cleared for farming, settlements, or roads. Most existing forest patches are second growth stands of poplar, white birch, white spruce, and young tolerant hardwood on abandoned farmland or on areas that have been logged. The few locations that still support mature SJRHF tend to be small sized, averaging just over 10 ha, and are isolated.

Further complicating the issue is on-going disturbance of remnant SJRHF stands. A recent assessment of SJRHF patches determined that even though they only occupy a small percentage of the total landscape, 44% of the known sites had been completely or partially clearcut between 1981-1997, and only 6% of the stands showed no evidence of at least some past cutting (MacDougall 1997). If these trends continue, there will soon be little or no mature tolerant hardwood left in the central St. John River Valley.

In New Brunswick's provincial land classification system, the SJRHF corresponds with Ecosites 7L, 7C, and 8C within the St. John River Valley. Currently, the DFA hold around 1500 hectares of these Ecosites within the Meductic Ecodistrict (formerly named St. John River Valley Ecodistrict).

Decision:

- The Saint John River Valley Hardwood Forest and its associated ecosites are considered as possible HCVs when in presence of mature forest conditions and/or key tree species occurs within the stands.

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

Assessment:

Old Forest Communities and Old-forest Wildlife Habitats in New Brunswick

Old Forest Communities (OFC) are the building blocks of the Province's strategy to supply old-forest conditions on Crown land. Eighteen unique communities, within 7 ecoregions, encompass the full range of naturally occurring old-forest conditions.

Old-forest Wildlife Habitats (OFWH) are groups of old forest communities that are further described at the stand level by abundance of woody debris and tree cavities,

and at the landscape level by patch size and inter-patch distance. All mature forest stands meet the composition requirements of one of the Old Forest Communities; however many do not meet the structural ones. The most apparent reasons are that stands are too young to have a sufficient number of large trees, or that they are poorly stocked, either naturally or due to partial harvest.

Maintaining old-forest species through the use of small patches is risky. There is an increased chance of losing the habitat due to windthrow, an increased risk of extirpation of species from a patch caused by reduced colonization through unsuitable areas, and many species are sensitive to the increased light and air flow coming in from the edges.

Old Tolerant Hardwood Forests

Throughout the province's major hardwood regions, extensive, formerly intact forests of Sugar Maple, Yellow Birch and Beech on slopes and uplands have been gridded with new forest-roads and subjected to strip and selection-cutting.

Hardwoods like Poplars and White Birches are relatively intolerant of shade and have shorter lifespans. They dominate early stages of forest succession initiated by larger-scale disturbances such as intensive harvesting or fire. Intolerant hardwoods have increased greatly in abundance in the province over the past few hundred years. In contrast, forests dominated by Sugar Maple have declined in extent and average age through clearance for settlement and agriculture, and ongoing harvesting. At present, they make up about nine percent of the Crown Forest. Although all hardwoods are treated together in general reporting on yields, forest management in the province takes detailed account of the ecological differences between tolerant and intolerant stands and species. The overall objective for tolerant hardwood forests is to maximize the sustainable yield of good quality sawlogs while meeting thresholds for biodiversity conservation and other non-timber values. Achieving this balance is a complex, many-layered challenge.

The threshold for conservation of old tolerant hardwood and other old forest communities in the province is currently set at 12% of their approximate natural occurrence (area). This percentage is based largely on modelling of the habitat requirements of old forest-dependent indicator species of birds and mammals.

Forest Inventory Data of the Freehold

According to the analysis of the forest inventory data of the AVN Freehold, 2.4% of the Forest Units associated with tolerant hardwoods (highlighted in yellow) are considered mature or overmature. Refer to Table 9.

In terms of development stage representativity, 11.4% of the DFA is considered to be at least mature (all forest management units combined). Refer to Table 10.

Table 8. Area represented by Mature and Overmature Forest Units within the Freehold.

Forest Unit Name	Development Stage	
	Mature	Overmature
	(hectare)	
BETH	13	0
BFMX	77	15
BFSP	14	0
BIHW	177	50
BIMX	41	10
BSMX	5	0
ECMX	79	14
ECSW	1249	393
EHMX	59	0
EHSW	188	0
IHHW	288	66
INHW	9	0
INMX	26	11
INSW	3	0
POHW	142	23
POMX	74	52
RMHW	17	6
RMMX	68	0
SMTH	60	0
SPMX	20	4
THHW	142	0
THIH	69	0
THMX	45	0
TLSW	16	1
TOHW	270	0
TOMX	243	62
TOSW	161	16
WPSW	48	0

Table 9. Summary of the area represented by Mature and Overmature Forest Units within the Freehold.

	Development Stage	
	Mature	Overmature
All Forest Unit (ha)	3606	723
All Forest Units (%)	9.5%	1.9%
Forest Unit associated with Tolerant Hardwoods (ha)	842	62
Forest Unit associated with Tolerant Hardwood (%)	2.2%	0.2%
Total Area of the Freehold (ha)	37876	

Decision:

- Old Forest Communities associated with Tolerant Hardwoods are underrepresented at the scale of the Freehold. Therefore, all OFCs identified by the Province's strategy to supply old-forest conditions are considered HCVs as well as any known occurrences of old-growth tolerant hardwoods forest stands.

4.3.3. Question 10) Are large landscape level forests (i.e., large unfragmented forests) rare or absent in the forest or ecoregion?

Assessment:

We believe that the elements relevant to the context of our forest concerning this question were addressed at the questions 6), 7) and 8).

Decision:

- All existing protected areas within and adjacent to the DFA are considered HCVs.
- There is no Intact Forest Landscape in New Brunswick. Therefore, no HCV were assigned for large and intact ecosystem.
- Conservation Area, such as DWA, and Vegetation Communities associated with Old Forest Habitat are considered as HCVs.
- The Saint John River Valley Hardwood Forest and its associated ecosites are considered as HCVs when in presence of mature forest conditions and/or key tree species occurs within the stands.
- No other HCV identified.

4.3.4. Question 11) Are there nationally /regionally significant diverse or unique forest ecosystems or forests associated with unique aquatic ecosystems?

Assessment:

We believe that the elements relevant to the context of our forest concerning this question were addressed at the questions 4) and 9).

Wetlands are defined in federal and provincial policy as land permanently or temporarily submerged or saturated by water near the soil surface, for long enough that the area maintains aquatic processes. These aquatic processes are characterized by plants that are adapted to saturated soil conditions, wet or poorly drained soils, and other biotic conditions found in wet environments (Government of Canada 1991; NBDNRE and NBDELG 2002). Wetlands in New Brunswick are managed by the

New Brunswick Department of Environment and Local Government (NBDELG), and their management is guided by the New Brunswick Wetlands Conservation Policy (NBDNRE 2002). This policy aims to protect wetlands through securement, stewardship, education and awareness, and to maintain wetland function within New Brunswick. Legislation that supports the policy includes the New Brunswick Clean Water Act and associated WAWA Regulation, and the New Brunswick Clean Environment Act and associated EIA Regulation. NBDELG maintains the official map of known wetlands in the province; it is available to the public on the GeoNB website (SNB 2011). As of November 2011, NBDELG considers the GeoNB map to represent the extent of "regulated" wetlands within the province. Any wetlands labelled as "Provincially Significant Wetlands" in this database are subject to a greater level of protection, as outlined in the New Brunswick Wetland Conservation Policy (NBDNRE and NBDELG 2002).

Decision:

- No HCV

4.4. HCV 4 – Critical ecosystem services

4.4.1. Question 12) Does the forest provide a significant source of drinking water?

Assessment:

It is by preserving water quality that forests contribute most significantly to improving the hydrological characteristics of watershed ecosystems. They achieve this by minimizing soil erosion, by reducing the sedimentation of water bodies (wetlands, ponds, lakes, streams, rivers) and by trapping or filtering other water pollutants in forest litter. Water quality can be altered, not only by sediment, but also by various types of pollutants including excessive concentrations of organic matter, hydrocarbons and agricultural or industrial chemicals. Forest is undoubtedly an appropriate plant cover for drinking water supply basins, since silvicultural activities (except for intensively managed plantations) do not require fertilizers or pesticides and avoid pollution by household waste or industrial processes. In addition, the pollution coming from sources like domestic, industrial and agricultural uses can be significantly reduced or eliminated by maintaining adequate buffers of riparian forest along streams. (Calder 2007)

Clean Water Act

The Province of New Brunswick has the responsibility of providing safe drinking water to the public while municipalities usually oversee the regular operation of their treatment facilities. In cities, towns and some villages, a public or municipal water system is used to bring clean water to everyone. Source water may come from groundwater or surface water which is pumped to a water treatment plant where it is made safe for drinking. In areas outside of the municipal water systems, private water wells are used. There are approximately 100,000 domestic water wells in New Brunswick. Municipally and provincially owned and operated water systems are required to sample their water according to the standards outlined in the Clean Water Act. According to the Act, regulations are in place to ensure the respect of the designation of all or any portion of a watershed, aquifer or ground water recharge area as a protected area and the prohibition of, control of, limitation of, allocation of or imposition of terms, conditions or standards respecting any activity, thing or water or land use within the area so designated, for the purpose of protecting the quality or quantity of the water in the protected area (SNB 1989, c C-6.1).

Watercourse buffer zones are the vegetated strips of land found immediately beside all banks of lakes, rivers and streams. They protect watercourses from effects of erosion, soil compaction and siltation caused by timber harvesting and road construction. Timber harvesting is permitted in buffer strips, as long as their protective function is maintained.

Saint John River Watersheds

The Saint John River originates in Somerset County, Maine and empties into the Bay of Fundy. The river drains an area of approximately 55 500 km^2 (about half of which lies in Canada). The principal tributaries of the Saint John River are the Aroostook, Madawaska, Nashwaak, Oromocto, St. Francis, Kennebecasis, Canaan and Tobique rivers. Forested land and agriculture are the predominant land uses in the Saint John River watershed. The lower Saint John watershed has an average summer temperature between 16 and 18°C, while average winter temperatures range from -6 to -9° C. This portion of the watershed receives about 1200 mm of precipitation annually.

There are 30 locations within the watershed area in order to sample and calculate the Water Quality Index (WQI). Based on the WQI, Saint John watershed have 2 sites were rated as excellent, 23 were good, 4 were fair and 1 was marginal. Fair and marginal water quality may be due to industrial discharges which are located at points throughout the watershed. These include a number of food processing plants and pulp and paper mills, numerous non municipal and municipal discharges as well as runoff from urban development. The removal of riparian vegetation (which leads to increased erosion) may have also contributed to the fair and marginal water quality results. For more details, refer to New Brunswick Watersheds Environmental Reporting (2007).

Forested land (83%) and agriculture (6%) are the predominant land uses in the Saint John watershed. Wetlands (5%) and water (2%) represent a major part of the remain.

There are numerous community groups that are involved with maintaining the ecological integrity of the Saint John watershed. These groups include *La Societé d'Aménagement de la Rivière Madawaska et du lac Temiscouata*, Meduxnekeag Watershed Association, the Nashwaak Watershed Association, Canaan-Washademoak Watershed Association and the Kennebecasis Watershed Restoration Committee. Also, the Canadian Rivers Institute of the University of New Brunswick is currently conducting various research projects throughout the watershed.

Watershed Protected Area

Scientists have identified 30 different watersheds in New Brunswick that supply municipal drinking water. These designated watersheds cover only four percent of the province's total land area, but service 21 communities and more than 300,000 residents. Each protected zone is defined under the Watershed Protected Area Designation Order. Standards may vary between each zone of protection.

- Zone 'A' is defined as any watercourse, including lakes, streams, ponds, rivers or brooks designated as protected, within the watershed area.
- Zone 'B', also called the 75-meter setback zone, is an area within a horizontal distance of 75 metres from the bank of watercourses.

- Zone 'C' is defined as the remaining area within the watershed, outside the 75-meter setback but within the watershed boundary. This is also sometimes referred to as the balance of the watershed area.

As demonstrated in Figure 2, there are no legally designated watersheds within the assessment area.

Figure 2. New Brunswick Designated Watersheds Map.

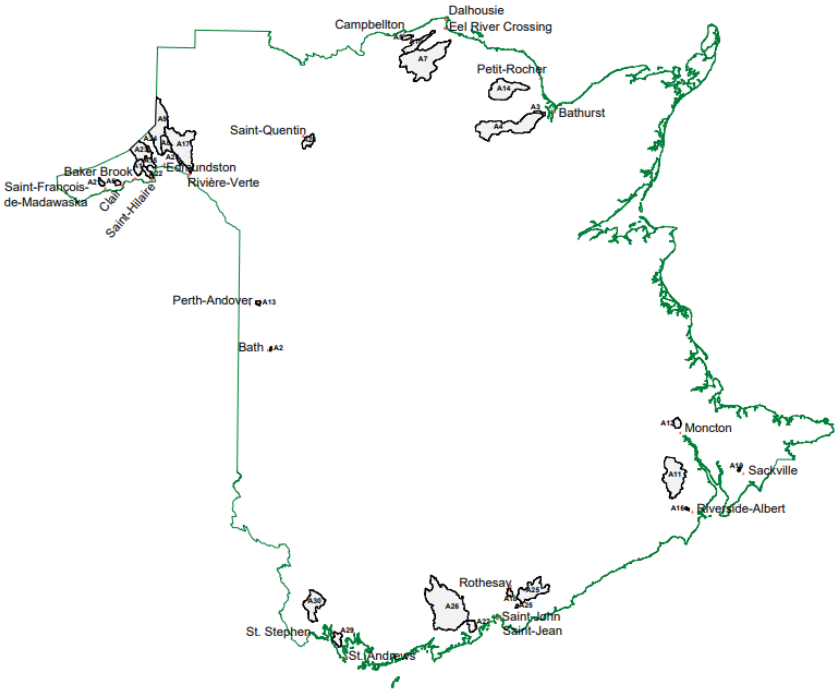


Table 10. Well drillers report from the Online Well Log System of the New Brunswick Department of Environment. This report summarize information of all the wells includes in a radius of 20 km from central point of the DFA surrounding areas.

	Well Use	
Category	Drinking Water	Non-Drinking Water
Abandoned	1	
Domestic	314	
Exploratory		18
Industrial		4
Monitoring		3
Other	2	1
Total	317	26

Decision:

- There are no Designated Watershed Protected Area within or near the Freehold. However, AVN recognized the primary role of the forest maintaining the quality of water. Therefore, as prescribed by the Watercourse and Wetland Buffer Zone Policy all perennial watercourses and wetlands will be protected through buffer zones. Buffer zones will be managed to regulate micro-climate, provide organic matter, maintain aquatic habitat, and act as sediment filters. Refer to Table 1 & 2 of the Forest Management Manual for New Brunswick Crown Lands for the standard to apply depending on the features encountered.
- No HCV

4.4.2. Question 13) Are there forests that provide a significant ecological service in mediating flooding and/or drought, controlling stream flow regulation, and water quality?

In New Brunswick, in the spring, inland flooding can occur with rapid snowmelt and heavy rainfall. Flooding can also be caused by water backing up behind an ice jam. At other times of the year, intense rainfall during major storms can cause flash flooding, particularly in smaller rivers.

Moreover, all of the water that is precipitated over an area covered with vegetation does not go to swell the underground drainage which feeds the springs and the regular flow of streams. A part is intercepted by the branches of trees, or leaves of vegetation, and is evaporated from them, back into the air; another part evaporates from the soil; a third part runs off from the surface of slopes into the valleys below; another portion is absorbed by vegetation and used by it for the building up of tissue and transpiration; finally, the surplus filters through into the ground and goes to supply the streams. (Newman 1939)

<u>NB Flood History Database</u>

This system contains records of flood events in New Brunswick from 1696 to the present. The database has been compiled from multiple sources and is currently maintained by the Department of Environment and Local Government. Each record contains descriptive information on each flood, plus information on causes, magnitude, the areas affected, and (if applicable) the nature and cost of damages. The database is fully searchable, and some records include photos and other supporting information.

Since 1900, 7 notable floods occurred in the vicinity of Nackawic. The highest flood was in 1973, the second highest was in 2008, and the third highest was 2018. Rapid melt in spring and late snowstorms resulted in major flooding along the St. John River and its tributaries.

Also, there are limits to the flood-mitigating effects of forests in this area since that from the DFA location there are dams upstream of the St. John. Those dams have to let go the water accumulation as soon as the water level surpass its containing capacity. When soils are fully saturated, any additional rainfall/snowmelt will run off the land, whether it is forested or not. Thus, forests can reduce peak flows from storms of short duration and lower intensity. They can downright prevent flooding that would otherwise occur in lesser storms and smaller watersheds particularly sensitive to rain events. They can minimize the damage from large storms. But they cannot prevent the major floods produced by storms of high intensity and long duration.

Provincially, the Watercourse and Wetland Alteration Regulation of the Clean Water Act regulates the activities that can be performed around watercourses and wetlands. Any person working in or within 30 metres of a watercourse or a wetland is required to obtain a Watercourse and Wetland Alteration permit prior to doing so.

Crown forestry operations are guided by the Forest Management Manual for New Brunswick, specifically the Watercourse and Wetland Buffer Zone Policy, which details buffer width thresholds around watercourses and wetlands, as well as harvesting restrictions within these buffer zones. Requirements pertaining to water crossing and road building are outlined in the Guidelines for Roads and Watercourse Crossings.

In summary, in New Brunswick regulatory measures exist to minimize the impact of forestry activities on watercourse and wetland functions and quality.

Decision:

- Considering that the Freehold area is relatively small compared to the overall extent of the forest in the St. John River watershed, we believe that the effect of the DFA to mediate flooding event is low. We did not identify high-risk areas for flooding or drought within the FMU. Therefore, no HCV have been assigned under this question.
- No HCV

4.4.3. Question 14) Are there forests critical to erosion control?

Assessment:

On sloping land, due to the force of gravity and the beating of raindrops, there is a risk of soil creep. Natural forest cover provides excellent protection against soil erosion, mainly because of the leaves of the lower canopy and the soil litter that dampens the flow of raindrops. The removal of forests and their replacement by other land-use systems can leads to an increase and an acceleration of erosion.

Good forest cover is more effective than any other type of vegetation in preventing sediment from entering the water. Soil cover, debris and tree roots trap sediments and prevent them from moving along slopes. In addition, the deep roots of trees stabilize slopes and help prevent slippage of the upper soil layer.

Steep sloped areas are particularly sensitive to erosion due to the increased potential velocity of runoff. However, steep slopes are uncommon throughout the Freehold.

Decision:

- We did not identify forest areas where the degree of slope carries high risk of erosion, landslides and avalanche that affect human infrastructure. Watercourse buffer zones protect watercourses from effects of erosion, soil compaction and siltation that can be caused by timber harvesting and road construction. Therefore, regulatory measures exist to minimize the impact of forestry activities on soils disturbances and erosion in New Brunswick. Therefore, no HCV have been assigned under this question.
- No HCV

4.4.4. Question 15) Are there forests that provide a critical barrier to destructive fire (in areas where fire is not a common natural agent of disturbance)?

Assessment:

Fire plays a much less important role in the northern hardwood forests characteristic of the New-England/Acadian forest, where spring and fall seasons are short. Under natural circumstances the tolerant hardwood forest has a fire cycle extended at the order of 800 to 1200 years. The hardwood-dominated landscape may provide some protection from fire, as flames move more readily through coniferous forests. The abundance of hydrological features across the forest landscape, as well as roads and natural stands, all act as barriers to wildfire spread.

New Brunswick Forest Fire Watch do not record any fire in the Fredericton area for the 2011-2020 period.

Burned areas mapped annually from the National Burned Area Composite for 1986 to 2019 do not show any wildfire in the DFA surrounding.

Decision:

- There are no areas where there is a high risk of uncontrolled, destructive fire and in which forest areas or forest types can act as a barrier to the spread of fires within the FMU. Since fire is not a common natural disturbance in the region, no HCV have been assigned under this question.
- No HCV

4.4.5. Question 16) Are there forest landscapes, or regional landscapes, that have a critical impact on agriculture or fisheries?

Assessment:

Forest can mediate wind and microclimate at the scale of ecoregions affect agriculture production. There are no agricultural activities within the boundary of the Freehold.

Also, riparian forests play a critical role in maintaining fisheries by providing bank stability, sediment control, nutrient inputs and microhabitats. Forest management activities in riparian areas on the DFA are implemented in a way to minimize harmful alteration or disruption of fish habitat. Recreational fishing is an important social and economic factor in the province. There are some outdoor establishments nearby the DFA that rely on recreational anglers for part of their business. Streams, brooks, creeks and lakes that cross the Freehold are known to be frequented by anglers.

All qualifying natural watercourses and wetlands encountered during harvesting operations must follow the requirements of the Clean Water Act, its regulations, terms and conditions. In N.B., the water features associated with fishes that apply to the Watercourse and Wetland Buffer Zone Policy are the following:

- Natural watercourse with continuous flow
- Natural watercourse
- Cold water inputs and refuge
- High-use Recreational Waters
- Significant spawning areas
- Brook trout lakes
- Arctic char and Lake trout lakes
- Crown Reserve Angling and Lease Waters

In New Brunswick, provincial/federal agencies and financial partners delivers programs and services to help achieve environmentally sustainable fishing. Collection of fisheries data by the Department of Natural Resources and Energy Development is limited and Fish Survey are completed by hundreds of anglers every year.

Decision:

- There are no agricultural or fisheries production areas in the forest. We believe that adjacency of forests to agriculture and fisheries production may be more relevant in the HCV component regarding meeting basic needs of local communities. Neither agriculture nor subsistence fisheries activities within the DFA are of a significant scale for regional or provincial

conservation interest. Therefore, no HCV have been assigned under this question.

- No HCV

4.5. HCV 5 – Community needs

4.5.1. Question 17) Are there local communities? This should include both people living inside the forest area and those living adjacent to it.

Assessment:

The local communities on and surrounding the AVN Freehold rely on the Forest for many aspects of daily life. As mentioned before, the entire DFA is highly valued by the community, although it is not appropriate to call a whole forest an HCV. The communities' relationship with the Forest is underscored by the communities' and AV Group Nackawic efforts to increase local influence over ERD policy, forest management, and wood flows. The organization makes efforts to expose the public to the forest, forest management and forest operations (such as field trips, presentations, and participation in public sessions) to get more public input.

First Nation communities

According to Indigenous and Northern Affairs Canada's Indian Register System, as of December 31, 2019, there are approximately 16,509 First Nations people in New Brunswick, 9,889 on reserve and 6,620 off reserve. Three of the 15 First Nations communities of New Brunswick are in the vicinity of the DFA.

Woodstock

The Woodstock First Nation are a Maliseet First Nation located near Woodstock N.B. The reserve is identified as Woodstock 23.

Kingsclear

Kingsclear First Nation is located along the Saint John River, approximately 15 km west of the City of Fredericton, New Brunswick. The registered population of the Kingsclear First Nation is approximately 981 members, with 692 members residing on-reserve.

St-Mary's

St. Mary's Band or St. Mary's First Nation is one of six Wolastoqiyik on the Saint John River in Canada. The St. Mary's Band lands comprise two reserves (Saint Mary's # 24, 1 ha; Devon # 30, 131.5 ha). The Saint Mary's reserve, established in 1867, lies on the northeast bank of the Saint John River, opposite to downtown Fredericton. A second, larger reserve, purchased in 1929, lies 3 km NNE of the St. Mary's reservation.

Recent (2002) acquisitions have expanded the reserve lands to 308 ha. Roughly half the members of the St. Mary's First Nation reside on the reserve lands.

Municipal areas:

Benton
The Village of Benton is located on the Eel River, with a population of 83.

Canterbury
Canterbury perish occupies a total of 533 hectares with 336 residents. Canterbury is located west of Fredericton, approximately 95 km, with neighbouring communities of Benton and Meductic. Canterbury perish includes Skiff Lake and Eel River Lake. AVG has culturally appropriate meetings when operations are in the area, with several groups; Skiff Lake Committee, Second Eel Lake Road Committee, Forest City Lake Committee, and the ATV/Snowmobile subcommittee. The Canterbury area would be where most of the AVG Freehold lands are located.

Fredericton
Provincial capital Fredericton has a population 58,220 of and a metro population of 111,024. AVG has culturally appropriate meetings with the Fish and Game Club and Ducks Unlimited. Through the Ducks Unlimited partnership, AVG has several wetland projects, which encompasses 3,500 acres of protected land.

Hanwell
Community of Hanwell, is in the greater metro population of Fredericton located on Route 640 southwest of Fredericton with a population of 4,700.

Hartland
The Town of Hartland is located at the mouth of Becaguimec Stream, 124 km upriver from Fredericton on the Saint John River. Population of 957.

Harvey
Harvey is situated at the southeastern end of Harvey Lake, the village is approximately 35 km southwest of Fredericton with a population of 356. AVG has culturally appropriate meetings with the Oromocto Lake Committee

Meductic
Meductic is a small village of 173 people, located along the Saint John River in southern New Brunswick, approximately 26 kilometres northwest of Nackawic. Meductic's mayor is Lance Graham, a silviculture contractor, AVG has culturally appropriate meetings with the town hall, mayor and council.

Millville
Village of Millville has a population of 273 centered on the intersection of Route 104 and Route 605, approximately 18 km North of Nackawic.

Nackawic
Nackawic is a town located 65 km west of the city of Fredericton on the east bank of

the Saint John River with a population of 941 people. AV Nackawic is located off route 605. AV Group directly interacts with the town hall, mayor and council, and has culturally appropriate meetings with members of the ATV and Snowmobile Club and Crosscounty Ski Club. It's also the location of the Pokiok nature trails that's managed by AVG. The Pokiok Nature Park located just outside Nackawic is a part of the Ducks Unlimited partnership.

New Maryland

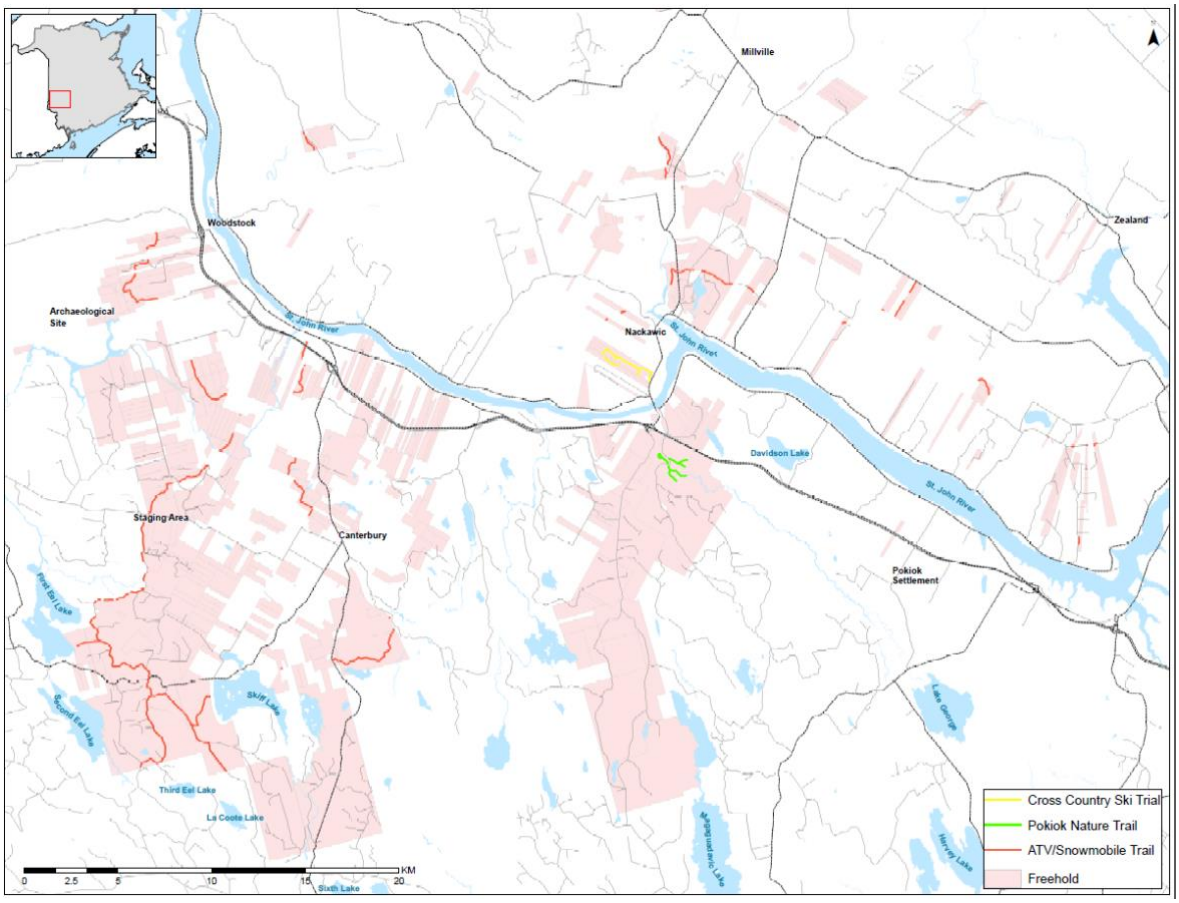
The Village of New Maryland is located directly south of Fredericton, with a population of 4,174.

Stanley

Stanley has a population of 412 and is situated on the Nashwaak River, 30 km north of Fredericton.

Woodstock

The community of Woodstock is located on the Saint John River, 103 km upriver from Fredericton at the mouth of the Meduxnekeag River, with a population of 5,228.



Decision:

Operational meetings/plans are held with community members to discuss potential HVCs. These are important consultations for AV Group and members of the public. Once an area is identified appropriate measures can be taken to ensure its protection if deemed HCV. These include hiking trails, Pokiok Sugary, Nackawic ski trails and Nature parks. For example the Skiff Lake salmon spawning ground was identified through this process. The Skiff Lake salmon spawning ground is the only land locked salmon spawning area, to ensure its protection the area around the zone became a no touch buffer zone. Moreover, through community engagement, the Skiff Lake warming shack was also put into place for the use of ATV and Snowmobile Clubs.

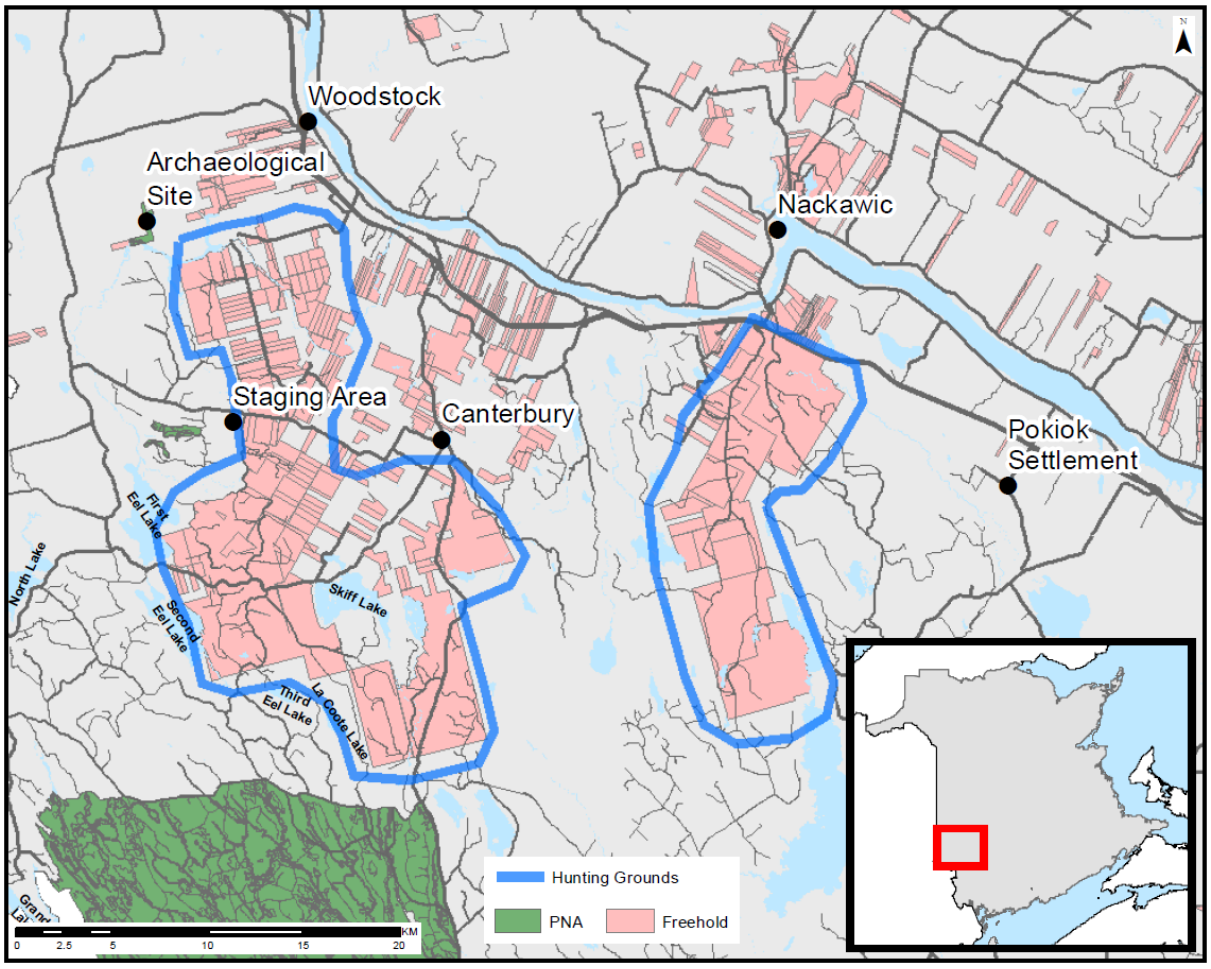
Assessment:

Current condition is assessed annually by reviewing operating plan with groups and townships within local vicinity of to determine possible HCVs. Refer to notes from annual meetings.

4.6. HCV 6 – Cultural values

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

Culturally significant hunting sites indicated by First Nations groups were identified as local areas around Canterbury, Skiff Lake, Burnt Knoll and Pokiok Road. All areas have open, unrestricted access to the public for recreational purposes. Adjacent to the DFA is a moose hunting staging area located on the Hartin Settlement road in Canterbury perish. Archaeological site is adjacent to FDA and has been removed from future operating plan.



Decision:

Although there is public access for recreational activities, for workers safety there are operational no hunting signs posted at all road access points within a 1 km radius around active operations. Active operations include but is not limited to: silviculture and harvest blocks. Archaeological site and moose hunting sites are considered HCV

due to their ecological and cultural heritage significant with First Nation Groups. Constructive discussions are ongoing.

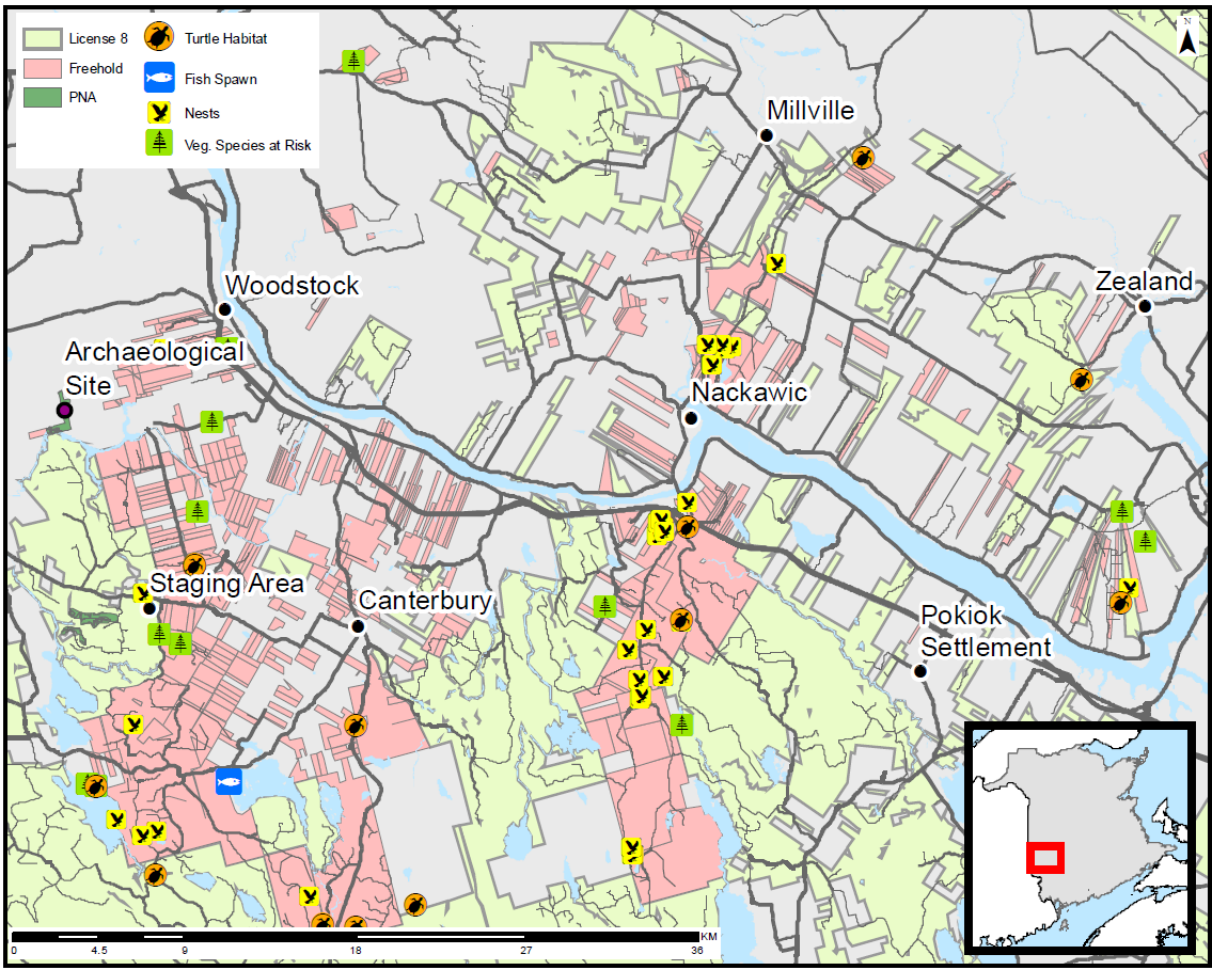
Assessment:
Current condition of values are assessed through ongoing discussions with representatives of First Nation Communities.

No hunting signs are posted regardless of HCVs in order to keep workers safe. No hunting signs are place on all access routes the day the block becomes active and are removed as soon as the block becomes inactive.

Pokiok Stream. Through discussions, a request was made to keep wider buffers along Pokiok Stream. No further information provided at this time.

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

Currently there are First Nations staging areas and an archeological site on the DFA. Information sharing and consultation is in its infancy with local First Nation communities to determine land use and values. These will be regularly updated in reports as relationships strengthen and information sharing continues. There are also SAR located within the DFA, these are managed on a case by case basis by the species requirements.



Decision:

Operationally AV Group has decided against any harvest near the archeological site to protect the area. The hunting area is open to use with minor limitations, as is the DFA for recreational purposes. Ground vegetation is treated with a no-touch buffer depending on species. Raptor nests are protected with DERD suggested buffer

guidelines, varying by species. Turtle nest sites are protected if found along roads, but a turtle sighting itself may not require protection.

Assessment:

Current condition of values are assessed through ongoing discussions with representatives of First Nation Communities. Values are known to evolve through time, therefore are difficult to identify in a static manner.

Assessed annually if values overlap to determine if more appropriate HCV candidate than what currently exists.

5. MANAGEMENT AND MONITORING STRATEGIES FOR HCVS AND HCVFS

Table 11. Management and Monitoring Strategies for HCVs and HCVFs on AV Group Nackawic Freehold Land.

HCV	Attribute	Prescription or Management strategy	Monitoring of the effectiveness of the management strategy	Monitoring of the condition of the HCV
	Bald eagle	Stop and move operations at least 200 m away when nests are observed. Report observed nest to Area Supervisors immediately (provide GPS point and/or location on block map). Respect buffer around nests, nesting season no-activity zones and no road zones.	EMS/Compliance monitoring. Using known occurances.	At 5 year interval during the revision of the HCVF assessment report. Monitoring could occur sooner if there are changes to the status of the species at risk.
	Snapping turtle	Leave adequate buffers of vegetation around important turtle habitat. Female wood turtle can wander up to 300 m from streams during the nesting season. Minimize the amounts of roads that linearly parallels a water course.	EMS/Compliance monitoring. Using known occurances.	At 5 year interval during the revision of the HCVF assessment report. Monitoring could occur sooner if there are changes to the status of the species at risk.

		Never build roads below the high water mark of water courses. Implementation of riparian buffer zone management.		
	Black Ash	Found in wet areas. Implementation of riparian buffer zone management. Minimize disturbance to these stands.	EMS/Compliance monitoring. Using known occurances.	At 5 year interval during the revision of the HCVF assessment report. Monitoring could occur sooner if there are changes to the status of the species at risk.
	All existing protected areas within and adjacent to the DFA are considered HCVs.	No management activities within these areas. Areas are to be maintained ion their current, natural condition.	EMS/compliance monitoring. Consultation with stakeholders.	At 5 year interval during the revision of the HCVF assessment report. Monitoring could occur sooner if there are changes to the condition of these areas.
	Old Forest Communities associated with Tolerant Hardwoods are underrepresented at the scale of the Freehold. Therefore, all OFCs identified by the Province's strategy to supply old-forest conditions are considered HCVs as well as any known occurrences of old-growth tolerant hardwoods forest stands.	TH stands.	EMS/Compliance monitoring. Management activities to promote TH composition in stands.	At 5 year interval during the revision of the HCVF assessment report. Monitoring could occur sooner if there are changes to the condition of these areas.
	Oak Mountain (93.07 ha) Mill Stream-Mactaquac (394.2 ha)	No management activities within these areas.	Monitoring through consultation with stakeholders.	At 5 year interval during the revision of the HCVF assessment report. Monitoring could occur sooner if there are changes to

	Risteen Brook (247.9 ha) Skiff Lake (479.2) Woodman (776.7) Pokiok Park (252.3 ha) Flat Top Mountain (68.3 ha) Nackawic Cross Country Trails (176.5 ha)	Areas are to be maintained ion their current, natural condition.		the condition of these areas. Determined through consultation.
	Operational meetings/plans are held with community members to discuss potential HVCs. These are important consultations for AV Group and members of the public. Once an area is identified appropriate measures can be taken to ensure its protection if deemed HCV. These include hiking trails, Pokiok Sugary, Nackawic ski trails and Nature parks. For example the Skiff Lake salmon spawning ground was identified through this process. The Skiff Lake salmon spawning ground is the only land locked salmon spawning area, to ensure its protection the area around the zone became a no touch buffer zone. Moreover, through community engagement, the Skiff Lake warming shack was also put	No management activities within these areas. Areas are to be maintained ion their current, natural condition.	Current condition is assessed annually by reviewing operating plan with groups and townships within local vicinity of to determine possible HCVs. Refer to notes from annual meetings.	Current condition is assessed annually by reviewing operating plan with groups and townships within local vicinity of to determine possible HCVs. Refer to notes from annual meetings.

	into place for the use of ATV and Snowmobile Clubs.			
	First Nations' values	No management activities within these areas. Areas are to be maintained ion their current, natural condition.	Monitoring through direct consultation	Current condition of values are assessed through ongoing discussions with representatives of First Nation Communities.

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High Conservation Value Forest Assessment

Peer Review Summary Report

Prepared for: AV Nackawic Inc.

Reviewed by: Silva Consulting

Reviewer: Andrea Doucette, MES

Date submitted: September 29, 2021

1. Introduction

The peer review of the High Conservation Values Assessment Report prepared by Abies Consultants for AV Nackawic was completed by Silva Consulting. The review process was based on the peer review procedure and checklist developed by the High Conservation Value Resource Network (Home - HCV (hcvnetwork.org). Any questions about this peer review report can be directed to Andrea Doucette at adoucette.silva@gmail.com.

Findings during the peer review were identified as either major, minor, recommendations, or none/not applicable. These categories are defined as:

- Major – the absence or failure to meet a fundamental requirement of the HCV assessment process
- Minor – an observed lapse that affects the clarity of the assessment process or report
- Recommendations – suggested improvements to the report
- None – no identified finding observed

Findings are provided by the peer reviewer to help improve the quality of the HCVF assessment report. It is expected that the findings will be addressed by AV Nackawic as part of the peer review process. It must also be noted that the required assessment of values under HCV categories 5 and 6 are missing in the report. These along with other noted missing sections are significant pieces of work that must be completed to ensure AV Nackawic's HCVF assessment meets all FSC certification requirements.

The amount of work thus far in the HCVF assessment is significant, however, there are significant sections incomplete or missing. Since an HCVF assessment can be quite large and daunting, it is always helpful to have as many summary tables and maps as possible for the reader to refer to when looking for specific information. A template could also be used in the report that clearly separates out HCV identification, management and monitoring to make it more understandable and clearer to the reader.

2. Summary Findings

HCV Identification, Management and Monitoring
Project name: HCVF Assessment Report, AV Nackawic Inc. **Reviewer: Andrea Doucette, Silva Consulting** **Date of review: Sep 28-29, 2021**
DESCRIPTION OF DOCUMENT CONTENT
1. Executive summary of the document
This section is evaluated by the below guiding questions: - Are the key findings clearly presented and summarized? - Does the summary accurately reflect the findings and recommendations of the main document? - If no summary exists, is it still possible to use the document easily?
Reviewer comments: **Finding – Minor** Recommend adding an Executive Summary with a summary table of identified HCVs and their total hectares, if applicable, for each of the 6 categories in the HCVF assessment report. An executive summary will provide the reader with a brief synopsis of the entire report which allows them to better understand the assessment results.
2. Scope of the Assessment
This section is evaluated by the below guiding questions: - Is the assessment area and surrounding landscape clearly defined? - Is there a basic summary of the company and its operations in the area? - Are the impact and scale of proposed operations adequately described? - Is the purpose of the HCV assessment clear?
Reviewer comments: Finding – None with recommendation

The sections on Forest Management Plan, Management Strategies, and Adaptive Management were not provided in report, but it is expected that the impact and scale of operations would be provided within these sections. AV Nackawic also has a website that outlines 2-year and 10-year spatial management plans along with detailed maps (Home - AV Group (av-group.ca)). The purpose of the assessment is provided in the report.

Recommend adding the company's website address in report.

3. Wider landscape context and significance of the assessed area

This section is evaluated by the below guiding questions:

- Is the wider landscape convincingly and adequately described?
- Are the key social and biological features of the wider landscape clearly described?

Reviewer comments: Finding – Minor

Although the report identifies conservation areas surrounding AV Nackawic's FMA, a description of how the broader landscape context was considered in the assessment relating to social and biological features is not provided. Other biological and social features may be present on the broader landscape such as hydrological processes and recreational activities.

Define a finite area with defined boundaries for which HCVs can be assessed at the broader landscape scale.

4. HCV assessment process including consultation process

For *each* of the sub- topics, was the process or effort proportionate and adequate relative to the likely impact and scale of operations?

4.1 Composition and qualifications of the assessment team

a) Did the team include or have adequate access to relevant expertise to assess biological and social values?

Reviewer comments: Finding – Minor

The HCVF report does not identify the names and affiliations of the assessment team so it is difficult to assess the qualifications of the team to assess biological and social values. Provide an appendix or in the Methodology section of report what relevant expertise was used to assess biological and social values (ie, stakeholder consultation, data sources, reports, government agencies, etc). Under section 2.1

Purpose, it is mentioned that the assessment included an internal review of the 19 questions. Expand on who was involved in the internal review of the assessment.

4.2 Data sources and data collection methodologies

a) Are data sources and data collection methodologies clearly described or referenced and summarized (and presented in annexes if appropriate), and are they adequate to identify HCVs?

b) Were reasonable efforts made to fill gaps in the data proportion to the impact and scale of the operations?

Reviewer comments – Finding - Major

HCV 1 – Secondary data sources along with known threats, habitat requirements, and current management provided for HCV1 Species Diversity are well laid out in the many tables provided for HCV1. Although there is no primary data provided in the report for HCV1, the information presented is sufficient to identify HCV. Recommend that data from the Atlantic Canada Data Conservation Centre be acquired to further validate decisions made on HCV status.

HCV 2 – Global Forest Watch is identified as the only source for identifying whether landscape-level ecosystems and mosaics are present on the landscape. Although this is an important piece of information, other internal analyses should be conducted to identify whether there are smaller intact forest landscapes that support populations of most native species and sufficient habitat. These smaller forest landscapes are also important for the long-term conservation of biodiversity in the Acadian forest region. Protected or conservation areas already established on the landscape should also be provided under HCV2. Supporting maps are also required.

HCV 3 – A more detailed analysis of naturally rare ecosites needs to be provided along with their HCV status, total hectares and supporting maps.

HCV 4 – Good background information is provided regarding drinking water sources in the study area. The report can make clearer whether the provincial Watercourse and Wetland Buffer Zone Policy is considered an HCV in protecting drinking water sources.

HCV 5 – This section of the assessment report is incomplete, so a peer review is not possible at this time.

HCV 6 – This section of the assessment report is incomplete, so a peer review is not possible at this time.

4.3 Consultation Process

a) Was there an appropriate consultation process for:

- Identification of HCVs
- Management of HCVs
- Monitoring of HCVs

b) Were appropriate existing initiatives engaged wherever possible (including existing local or international social, ecological or biological conservation initiatives)?

Reviewer comments – Finding – Major

At the time of the peer review, an appropriate consultation process for the HCVF assessment was being undertaken by AV Nackawic. No consultation had been summarized in the report at the time of when this peer review was completed.

Consultation is a significant requirement of the HCVF assessment process and the FSC National Standard. Work that must be completed related to consultation needs to be incorporated into the HCVF assessment report when finalized. A table summarizing which stakeholders were consulted, what information or comments were provided, and how that information was incorporated (or not) into the report is a very important component of Principle 9 of the FSC National standard.

5. Identification, location and status of each HCV

For all HCVs, are the following points addressed, and was the process or effort proportionate and adequate relative to the likely impact and scale of operations?

5.1 <u>Addressing all six HCV categories</u>

a) Are all six HCVs addressed in the report?

b) If one or more HCVs are not addressed, is there adequate justification for not doing so (eg. the HCV is absent beyond reasonable doubt?)

Reviewer comments – Finding – Major

HCV categories 5 and 6 are incomplete and are required to fulfill a complete HCVF assessment for FSC certification.

5.2 <u>Data Quality</u>

a) Are data detailed, recent and complete enough to make informed decisions on presence/status/location of the HCV?

b) Is the precautionary principle appropriately invoked in the use of data?

c) Were maps, reports and other previously existing data up to date and adequate?

d) Is there an understanding of the spatial accuracy of the data used?

e) Should further data be collected before decisions are made?

Reviewer comments – Finding – Minor HCV 1 through 4; Major HCV 5 and 6

HCV 1 through HCV 4 – Secondary data sources such as reports, policies, and regulations were used for the HCVF assessment. However, primary data sources such as provincial GIS data layers, ACCDC data, and other GIS data sources should be used to fill in gaps as needed. These primary data sources are also important in the develop of maps for identified HCVs. Some data sources are perhaps outdated, so expanding the search on more recent data sources and through stakeholder consultation will help strengthen HCV decisions. Some decisions are made based on no known occurrences on the freehold land-base, however, with primary data sources and maps, these decisions would be better supported.

HCV 5 – This section of the assessment report is incomplete, so a peer review is not possible at this time.

HCV 6 – This section of the assessment report is incomplete, so a peer review is not possible at this time.

5.3 Reference to HCV toolkits

a) Has a national interpretation of HCVs been used, or in absence of a national interpretation, have the generic HCVF toolkit guidelines been appropriately interpreted?

Reviewer comments – Finding – None

The framework used to conduct the HCVF assessment follows the 19 questions provided in Appendix D of the FSC National Forest Stewardship Standard of Canada.

5.4 Decision on HCV status

a) Is the HCV present, potentially present or absent in the assessed area?

b) Has the presence of the HCV in the wider landscape and nationally, regionally or globally been addressed?

c) Is the HCV (and its components) clearly defined and described?

d) Is the description sufficient for responsible parties reliably to identify the HCV?

e) Was the precautionary principle appropriately invoked in making the decision on HCV status?

Reviewer comments – Finding – Minor HCV 1 through 4; Major HCV 5 and 6

HCV 1 through HCV 4 – similar to the previous section on data quality, the use of primary data sources will help further verify whether an HCV is present, potentially present or absent in the assessed area. A more detailed analysis for why the three listed lichens in the report are not considered HCV should be provided since they are all species that rely on forest stands and found on specific tree species. The decision provided on page 71 of the report is not clear as to what that decision applies to (ie. specific species), nor the items listed for addressing the potential HCV are not clearly outlined in relation to specific species. A paragraph about the precautionary approach and if or where it was used in the identification of HCVs should be included in the report. This is especially important for biological HVs where assumptions about species distribution and ecosystems have to be made.

HCV 5 – This section of the assessment report is incomplete, so a peer review is not possible at this time.

HCV 6 – This section of the assessment report is incomplete, so a peer review is not possible at this time.

5.5 Mapping Decisions

a) Are maps of HCV occurrence clear, accurate and useful?

b) Are maps of HCV occurrence presented at an adequate level of resolution and sufficient completeness for management decisions?

Reviewer comments – Finding – Major

Detailed maps showing HCV occurrence on the landscape is missing throughout the report. Although there are some maps (eg. Identified Endemic Species, page 75), the lack of maps throughout the report is noticeable. Where possible, high resolution maps need to be completed for all HCVs with the HCVF area clearly displayed.

6. Management of HCVs

For each HCV, either individually or collectively, were the following points addressed appropriately, relative to the likely impact and scale of operations?

6.1 Assessment of threats or risks to each HCV within the landscape context

a) Are threats or risks from current or planned management activities to each HCV within the assessment area identified?

b) Have HCV management areas and management prescriptions been defined for each HCV, wherever those HCVs occur?

c) Are threats from external factors to each HCV within the assessment area identified?

d) Are aspects which might help to preserve the HCVs outside the assessment area identified (e.g. protected areas, inaccessible areas, favourable land use, active conservation programmes etc)?

e) Are aspects which would tend to threaten the HCVs outside the assessment area
identified (e.g. unfavourable land use, hunting pressures etc.)

Reviewer comments – Finding - Major

HCV 1 though to HCV 4 - Threats to species and their habitat, along with current management by either AV Nackawic or other organizations are provided. Specific management prescriptions for identified HCVs have not been clearly stated to ensure that the value is either maintained or enhanced. Management areas for HCVs have not been defined for most since maps are often absent. Internal threats from AV Nackawic have not been provided, which would be needed to develop effective management prescriptions.

Maps, as feasible, of all HCV management areas (HCVFs) are needed to help support management prescriptions.

HCV 5 – This section of the assessment report is incomplete, so a peer review is not possible at this time.

HCV 6 – This section of the assessment report is incomplete, so a peer review is not possible at this time.

6.2 Are HCV management plans adequate?

a) Are management objectives clearly described and appropriate?

b) Are management prescriptions clearly described and appropriate to meet stated objectives?

Reviewer comments – Finding - Major

HCV 1 through HCV 4 – Management objectives are not stated in the report. Management prescriptions are not described to meet stated objectives.

Management objectives and prescriptions need to be developed and relevant to maintaining and/or enhancing the HCVs. Management recommendations should be described in detail and cross-referenced with stakeholder input or publications that show stated recommendations are suitable in achieving the management objectives.

HCV 5 – This section of the assessment report is incomplete, so a peer review is not possible at this time.

HCV 6 – This section of the assessment report is incomplete, so a peer review is not possible at this time.

6.3 Protection of HCVs from land use conversion

a) Has each HCV been appropriately identified and mapped, within the wider context, prior to any land use conversion activity?
b) Have appropriately scaled maps of HCV management areas been presented, prior to any land use conversion activity?
c) For each HCV management area, are appropriate management prescriptions clearly described?
d) Will HCV management areas adequately maintain or enhance HCVs at the site and landscape level, given known plans for surrounding areas?

Reviewer comments – Finding - None

There are no identified land use conversion activities stated for HCV areas.

7. Monitoring of HCVs

For each HCV, either individually or collectively, were the following points addressed appropriately, relative to the likely impact and scale of operations?

7.1 Monitoring plans clearly described

a) Are monitoring objectives clearly described and appropriate?
b) Are methodologies clearly described and appropriate to meet stated objectives?

Reviewer comments – Finding - Major

HCV 1 through HCV 4 – Monitoring plans or strategies were not provided in the assessment report. Table 12 under section 5 of the report outlines the necessary elements of a monitoring strategy (identified HCV, management objective, management strategy, indicator and threshold, operational monitoring, and strategic monitoring). However, the table has not yet been completed with the necessary information to form a monitoring strategy.

A monitoring strategy is a key element of the HCVF assessment process and FSC certification. Include a monitoring recommendation for every management recommendation to measure its effectiveness. The methodology used for monitoring should also be described.

HCV 5 – This section of the assessment report is incomplete, so a peer review is not possible at this time.

HCV 6 – This section of the assessment report is incomplete, so a peer review is not possible at this time.

7.2 Monitoring plans adequate

a) Does the monitoring plan adequately deal with significant changes arising from proposed management operations, or known or likely external threats to HCVs?

Reviewer comments – Finding - Major

See comments under 7.1

7.3 Plans for a regular review of data in the management and monitoring plan

a) Is there a clear line of responsibility?
b) Is the monitoring system review process adequate for capturing effects of likely threats/risks to HCVs?

Reviewer comments – Finding - Major

A clear line of responsibility for an on-going review process has not been identified in the assessment report. An overview of how the monitoring system review process will be conducted is needed. It is advisable to describe how the results of monitoring will be reviewed by AV Nackawic and acted upon as needed, especially if HCVs are being negatively impacted forest management activities.