

Lower Churchill Management Corporation



LCP Avifauna Management Plan

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1 PURPOSE

Avifauna in Newfoundland and Labrador are managed by both federal and provincial regulatory agencies. For certain species, there are policies and regulations governing development activities on the landscape. As there is a risk that activities associated with the Lower Churchill Hydroelectric Generation Project and the Labrador-Island Transmission Link may cause disturbance to bird species, the Lower Churchill Project (LCP) has developed this Avifauna Management Plan (AMP) to manage the potential effects and maintain compliance with applicable legislation.

2 SCOPE

This plan addresses the required aspects of avifauna management for the construction phases of the LCP including Muskrat Falls Generation, Labrador Transmission Assets, and the Labrador-Island Transmission Link (described in Section 6.0). This AMP supersedes the 2012 Avifauna Management Plan (LCP-SC-CD-0000-EV-RP-0002-01).

3 ACRONYMS AND ABBREVIATIONS

CEAA	CANADIAN ENVIRONMENTAL ASSESSMENT ACT
COSEWIC	COMMITTEE ON THE STATUS OF ENDANGERED WILDLIFE IN CANADA
CWS	CANADIAN WILDLIFE SERVICE
EA	ENVIRONMENTAL ASSESSMENT
EMP	ENVIRONMENTAL MANAGEMENT PLAN
EPP	ENVIRONMENTAL PROTECTION PLAN
EMS	ENVIRONMENTAL MANAGEMENT SYSTEM
ERC	ENVIRONMENT AND REGULATORY COMPLIANCE
GEN	GENERATION
HSE	HEALTH SAFETY AND ENVIRONMENT
HVAC	HIGH VOLTAGE ALTERNATING CURRENT
HVDC	HIGH VOLTAGE DIRECT CURRENT

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LTA	LABRADOR TRANSMISSION ASSET
LCP	LOWER CHURCHILL PROJECT
NE	NALCOR ENERGY
NLDEC	NEWFOUNDLAND AND LABRADOR DEPARTMENT OF ENVIRONMENT AND CONSERVATION
OSEM	ON-SITE ENVIRONMENTAL MONITOR
PEEMP	PROTECTION AND ENVIRONMENTAL EFFECTS MONITORING PLAN
RCP	REGULATORY COMPLIANCE PLAN
RP	REHABILITATION PLAN
SARA	SPECIES AT RISK ACT

4 DEFINITIONS

Environmental Assessment: An evaluation of a project's potential environmental risks and effects before it is carried out and identification of ways to improve project design and implementation to prevent, minimize, mitigate, or compensate for adverse environmental effects and to enhance positive effects. Reminder

Environmental Management: The management of human interactions with the environment (air, water and land and all species that occupy these habitats including humans).

Environmental Management System: Part of an organization's management system used to develop and implement its environmental policy and manage its environmental aspects.

Environmental Protection Plan: Document outlining the specific mitigation measures, contingency plans and emergency response procedures to be implemented during the construction or operations of a facility.

Environmental Effects Monitoring: Monitoring of overall Project effects to confirm the predictions of EA and to fulfill EA commitments.

Environmental Compliance Monitoring: Monitoring of Project activities to confirm compliance with regulatory requirements and commitments made through the EA process.

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5 REFERENCES

LCP-PT-MD-0000-PM-PL-0001-01 - LCP PROJECT EXECUTION PLAN

LCP-PT-MD-0000-PM-CH-0001-01 - LCP PROJECT CHARTER

LCP-PT-MD-0000-RT-PL-0001-01 - REGULATORY COMPLIANCE PLAN

LCP-PT-MD-0000-HS-PL-0001-01 - HEALTH AND SAFETY PLAN

LCP-PT-MD-0000-HS-PL-0004-01 - LCP EMERGENCY RESPONSE PLAN

LCP-PT-MD-0000-IM-PL-0003-01 - INFORMATION MANAGEMENT PLAN

LCP-PT-MD-0000-CO-PL-0001-01 - COMMUNICATIONS AND STAKEHOLDER RELATIONS PLAN

LCP-PT-MD-0000-EV-PL-0002-01 - LCP INTEGRATED ENVIRONMENTAL MANAGEMENT PLAN

6 EXTERNAL REFERENCES

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Government of Canada. 2012. Species at Risk public Registry: Schedule 1 – List of Wildlife Species at Risk. Available at: http://www.sararegistry.gc.ca/species/schedules_e.cfm?id=1s. Accessed on: 16 April 2012.

NLDEC (Newfoundland and Labrador Department of Environment and Conservation). 2012a. Species at Risk: Birds. Available at: <http://www.env.gov.nl.ca/env/wildlife/endangeredspecies/birds.html>. Accessed on: 13 April 2012.

Personal Communication

Gahbauer, M. Senior Wildlife Biologist, Stantec Consulting Ltd. Correspondence with Environment Canada in 2009.

7 PROJECT DESCRIPTION

7.1 MUSKRAT FALLS GENERATION

The Muskrat Falls Generation Project will include the following sub-components which are broken down under the five principal areas of the development:

- 22 km of access roads, including upgrading and new construction, and temporary bridges;
- A 1,500 person accommodations complex (for the construction period);
- A north roller compacted concrete overflow dam;
- A south rockfill dam;
- River diversion during construction via the spillway;

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- 5 vertical gate spillway;
- Reservoir preparation and reservoir clearing;
- Replacement of fish and terrestrial habitat; North spur stabilization works;
- A close coupled intake and powerhouse, including:
- 4 intakes with gates and trash racks;
- 4 turbine/generator units at approximately 206 MW each with associated ancillary electrical/mechanical and protection/control equipment;
- 5 power transformers (includes 1 spare), located on the draft tube deck of the powerhouse;
- 2 overhead cranes each rated at 450 Tonnes.

7.2 LABRADOR-ISLAND LINK (LIL)

The LITL consists of the overland high voltage direct current (HVdc) Transmission system and associated HVdc converter station systems, the Strait of Belle Isle (SOBI) Marine Crossing and the new synchronous condenser facility. Specifically it includes:

- HVdc Specialties
- Converter Stations at Muskrat Falls and Soldiers Pond;
- Transition Compounds at Forteau and Shoal Cove;
- AC Substations at Churchill Falls, Muskrat Falls and Soldiers Pond;
- Electrode Sites at L'Anse au Diable and Dowden's Point;
- Repeater Sites at Three Rocks, Hampden and White Hills; and
- Synchronous Condensers at Soldiers Pond.

7.3 HVAC AND HVDC OVERLAND TRANSMISSION

- Overland HVac transmission line from Muskrat Falls to Churchill Falls (approximately 247km);
- Overhead HVdc transmission line from Muskrat Falls to the Strait of Belle Isle (approximately 383 km);

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- Overhead electrode line from the HVdc transmission line to L' Anse au Diable (approximately 22 km);
- Overhead HVdc transmission line from the Strait of Belle Isle to Soldiers Pond on the Island's Avalon Peninsula (approximately 695 km); and
- Overhead electrode line from Soldiers Pond to Dowden's Point (approximately 12 km).

7.4 STRAIT OF BELLE ISLE (SOBI) MARINE CROSSING

- The SOBI marine crossing comprises a 350 kV, 900 megawatt (MW) submarine cable system that extends from Forteau to Shoal Cove. This component of the LCP includes:
- Six (6) Horizontal Direct Drilling (HDD) boreholes, three (3) on each side of the SOBI, all lined with conduits that penetrate the seabed at 60 to 80 m water depth;
- Installing three (3) land based cables in Forteau and Shoal Cove;
- Three (3) submarine HVdc Mass Impregnated (MI) cables laid on the seafloor and transition from sea to land through the lined HDD boreholes over a 34 km corridor; and
- Installing rock protection over the three (3) submarine cables.

8 REGULATORY CONTEXT

8.1 MIGRATORY BIRDS CONVENTION ACT

The Migratory Birds Convention Act (MBCA) was designed to protect and conserve migratory birds, both as populations and individual birds, and their nests (internet site: Government of Canada 1994a). In Canada, the MBCA and associated Migratory Birds Regulations (internet site: Government of Canada 1994b) are administered through Environment Canada by the Canadian Wildlife Service (CWS) (internet site: Government of Canada 1994a). Coverage of the MBCA includes landbirds (e.g., warblers, thrushes, and sparrows, waterfowl (e.g., ducks, loons and geese), and waterbirds (e.g., gulls and terns) but does not include grouse, ptarmigan, hawks, eagles, owls, crows or jays (Environment Canada 1991).

The Migratory Birds Regulations prohibit the disturbance, destruction, or taking of a nest, nest shelter, eider duck shelter or duck box of a migratory bird, or the possession of a live migratory bird, or a carcass, skin, nest or egg of a migratory bird (internet site: Government of Canada 1994b). Permits for these activities cannot be issued by CWS or Environment Canada (Joint Review Panel 2011, pg. 140).

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8.2 SPECIES AT RISK ACT

The Species at Risk Act, 2002 (SARA) was established to provide wildlife species additional protection against extirpation, extinction or endangerment (internet site: Government of Canada 2002). This includes protection from human activity. Species at risk are classified by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) as extirpated, endangered, threatened or of special concern depending on the level of risk. Like the MBCA, this affords protection at a federal level by prohibiting the killing, harming, harassment, capture or taking, or collection of a listed species, and the damage or destruction of a residence of a listed species (internet site: Government of Canada 2002).

8.3 NEWFOUNDLAND AND LABRADOR ENDANGERED SPECIES ACT

Provincially, wildlife species at risk are managed under the Newfoundland and Labrador Endangered Species Act, 2004 (NLESA), designed to complement federal SARA legislation. The NLESA protects wildlife species, subspecies or populations within the province that are considered endangered, threatened or vulnerable based on recommendations from COSEWIC or the provincial Species Status Advisory Committee (SSAC) (internet site: Government of Newfoundland and Labrador 2004). Under NLESA it is prohibited to disturb, harass, injure or kill any individual of a listed species, disturb or destroy the residence of listed species, or be in possession of individuals of a listed species (internet site: Government of Newfoundland and Labrador 2004). There are currently 14 bird species listed under NLESA (NLDEC 2012a).

9 BASELINE INFORMATION

9.1 KEY AVIFAUNA SPECIES

The majority of migratory species, which are protected under federal and / or provincial legislation, can be grouped into four categories:

- Landbirds;
- Waterfowl;
- Waterbirds; and
- Shorebirds.

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Of particular concern are the species at risk. The species at risk known to occur within the lower Churchill River valley include the Olive-sided flycatcher (*Contopus cooperi*), Common Nighthawk (*Chordeiles minor*), Rusty Blackbird (*Euphagus carolinus*), Harlequin Duck (*Histrionicus histrionicus*), and Gray-cheeked Thrush (*Catharus minimus*). Although raptors are not covered under the MBCA, they are subject to provincial regulations.

Surveys were conducted to determine the presence and in some cases, relative abundance, of each category of avifauna species within the lower Churchill River valley (Minaskuat Inc. 2008a). Breeding forest landbird surveys were completed by surveying ground transects at different locations and in different habitat types. The most commonly observed landbird species included Ruby Crowned Kinglet (*Regulus calendula*), Dark-eyed Junco (*Junco hyemalis*), Swainson's Thrush (*Catharus ustulatus*), Tennessee Warbler (*Oreothlypis peregrina*), White-throated Sparrow (*Zonotrichia albicollis*), Yellow Warbler (*Setophagus petechia*), Boreal Chickadee (*Poecile hudsonicus*) and Black-throated Green Warbler (*Setophagus virens*).

Waterfowl presence and abundance was determined from aerial and water based surveys of rivers and wetlands (LGL 2008). The activity, productivity and success of raptor nests within the lower Churchill River valley was determined by surveying known nest sites and searching for others within areas of future disturbance (Minaskuat Inc. 2008b).

9.2 HABITAT WITHIN PROJECT AREA

9.2.1 Ecological Land Classification

An Ecological Land Classification (ELC) of the Project Area was completed along the lower Churchill River valley (Minaskuat Inc. 2008b). Thirteen ecotypes were combined into habitat types based on similar characteristics (Table 8-1).

Table 8-1 Summary of ELC Ecotypes for the Lower Churchill River Valley

Ecotype	General Description
Black Spruce/Lichen Woodland	Open black spruce/lichen complex; small patches of mostly stunted black spruce surrounded by large areas of <i>Cladina</i> spp. Lichens
Black Spruce/Sphagnum Woodland	Open canopy of stunted black spruce with understory of <i>Sphagnum</i> spp. mosses, forbes, sedges and other mosses; often at the margin of wetlands such as between bogs and fens, and coniferous forest

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Ecotype	General Description
Marsh	Exists along the banks of the Churchill river and its tributaries; flooding and scouring by ice limit vegetative growth; no tree cover and sparse ground cover including bulrushes, rushes, sedges and grasses
Black Spruce on Outcropping	Exists on exposed bedrock typically on crests of hill and ridges; due to exposure in these areas, shrub cover is sparse and tree cover consists of black spruce growing in small sheltered areas; ground cover may include <i>Cladina</i> spp. lichens and feathermoss
Fen	Ground cover includes sphagnum mosses, sedges and grasses with sparse shrub cover; trees are balsam fir and American larch; fens may be ribbed fens or unpatterned
Low Shrub Bog	Peat lands that support sparse tree cover (black spruce or American larch) and stunted patchy shrub cover; sphagnum mosses and sedges form the ground cover; bogs may also be patterned and unpatterned; most common wetland ecotype
Riparian Meadow	Exist along the shores of long rivers with large flood plains; due to ice scouring and flooding, vegetation is maintained at an early stage of succession; meadows consist primarily of blue-joint reedgrass, tall meadow-rue and dwarf red raspberry mixed with patches of shrubs, generally less than 2 m tall; there is no tree cover
Black Spruce/Feathermoss	Dense black spruce tree canopy; shrub layer consists of Labrador tea, velvetleaf blueberry and small black spruce; ground vegetation includes feathermoss and <i>Cladina</i> spp; occurs in river valley and surrounding upland areas
Mixedwood Forest	Occurs along the Churchill River valley and the valleys of tributaries; dense tree canopy includes heart-leaved paper birch, balsam fir and black spruce; shrub layer includes green alder, squashberry and young black spruce and balsam fir; ground vegetation consists of mosses intermixed with forbes and pteridophytes
Fir-White Spruce Woodland	Dense tree canopy of balsam fir and white spruce that may include heart-leaved paper birch; shrub cover primarily composed of regenerating balsam fir and speckled alder and squashberry; ground cover includes mosses mixed with forest forbs
Hardwood	On upland slopes mostly north of Gull Island; dense canopy includes heart-leaved paper birch, paper birch, quaking aspen, balsam poplar, balsam fir and black or white spruce;

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Ecotype	General Description
	shrub layer may be green or speckled alder, squashberry and regenerating balsam fir, black spruce and heart-leaved paper birch; ground cover includes forest forbs
Spruce-Fir Feathermoss	Churchill River valley and the larger tributaries; moderately dense canopy consisting of black spruce and balsam fir; shrub layer includes regenerating canopy tree species; ground cover of moss carpet and may include other species such as mountain cranberry
Riparian Thicket	Along shores of large rivers where sediments have accumulated at bends and on river islands; are a successional stage between Riparian Meadow and other forest ecotypes; shrub cover includes alder and willow spp.; tree cover is sparse and may include heart-leaved paper birch, white spruce and balsam fir with sparse ground cover
Notes: Source: Minaskuat Inc. 2008b	

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9.2.2 Avifauna Associated with Habitat Types

Of the avifauna species that may be breeding within the lower Churchill River valley, many have specialized habitat requirements and therefore are associated with particular habitat types (Table 8-2).

Table 8-2 Most Abundant Breeding Land Birds; Species at Risk (SARA) and Newfoundland and Labrador Endangered Species and Naturally Rare Occurring Species by Habitat Type in Lower Churchill River Valley

Habitat	Most Abundant Breeding Landbirds	Species at Risk (SARA/COSEWIC) and Newfoundland and Labrador Endangered Species (NLESA)
Riparian	Yellow Warbler, Northern Waterthrush, Cedar Waxwing, Alder Flycatcher, Magnolia Warbler, Lincoln's Sparrow, White-throated Sparrow	Harlequin Duck
Wetland	Lincoln's Sparrow, Northern Waterthrush, White-throated Sparrow, Wilson's Warbler, Swamp Sparrow, Yellow Warbler	Rusty Blackbird
Dry Spruce	Dark-eyed Junco, Ruby-crowned Kinglet, Yellow-rumped Warbler, Boreal Chickadee, White-throated Sparrow, Fox Sparrow	N/A
Wet Spruce	Dark-eyed Junco, Ruby-crowned Kinglet, Yellow-rumped Warbler, Swainson's Thrush, Boreal Chickadee, Tennessee Warbler	N/A
White Spruce	Tennessee Warbler, Magnolia Warbler, Yellow-rumped Warbler, Swainson's Thrush, Ruby-crowned Kinglet, Black-throated Green Warbler, White-throated Sparrow	N/A
Fir/Spruce	Swainson's Thrush, Ruby-crowned Kinglet, Tennessee Warbler, Dark-eyed Junco, Yellow-rumped Warbler, White-throated Sparrow	N/A
Mixed Fir	Black-throated Green Warbler, Tennessee Warbler,	N/A

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Habitat	Most Abundant Breeding Landbirds	Species at Risk (SARA/COSEWIC) and Newfoundland and Labrador Endangered Species (NLESA)
	Swainson's Thrush, Boreal Chickadee, Yellow-rumped Warbler, Ruby-crowned Kinglet	
Mixed Spruce	Dark-eyed Junco, Ruby-crowned Kinglet, Swainson's Thrush, Tennessee Warbler, Black-throated Green Warbler, Boreal Chickadee, Yellow-rumped Warbler	Gray-cheeked Thrush
Hardwood	White-throated Sparrow, Tennessee Warbler, Black-throated Green Warbler, Least Flycatcher, Swainson's Thrush, Northern Waterthrush, Orange-crowned Warbler	N/A
Burn	White-throated Sparrow, Dark-eyed Junco, Hermit Thrush, Boreal Chickadee, Swainson's Thrush, Yellow-bellied Flycatcher, American Robin	Olive-sided Flycatcher
Open Areas	N/A	Common Nighthawk
Source: Avifauna Species Observed in the Churchill River Valley, 2006-2007 (Minaskuat Inc. 2008a)		

10 PROPOSED MITIGATION MEASURES

There are three levels of mitigation measures to be implemented with this Avifauna Management Plan:

Level I - designed to reduce the likelihood of interaction during clearing and other construction activities;

Level II - considerations personnel should be aware of that may identify an active nest; and

Level III – protocols for aerial and ground avifauna surveys that are completed by surveyors in areas of potential habitat within and near the Project footprint.

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10.1 LEVEL 1 PROTECTION – GENERAL MITIGATION MEASURES

There are a number of general mitigation measures that will be implemented to reduce the effects of construction on all species of avifauna:

- Avoid disturbance and / or clearing of sensitive wildlife areas;
- Implement no harvesting policy and other harassment of wildlife, and no possession of firearms or pets by Project personnel;
- Implement environmental awareness training and conduct regular briefings for all personnel;
- Employ trained and experienced environmental monitors to implement the EPP;
- Use existing roads, quarries and other disturbed areas, where possible;
- Restrict public access to temporary roads and work areas;
- Post and enforce speed limits;
- Locate construction roads within the reservoirs where possible;
- Rehabilitate work areas and access roads no longer required in accordance with the EPP to encourage re-formation of natural conditions;
- Undertake blasting in accordance with permits and standard procedures;
- Use existing right-of-way corridors for construction of transmission lines where possible;
- Schedule activities related to transmission line construction around sensitive periods or areas, to the extent practical;
- Create conditions for establishing formation of hardwood forest at selected locations; and
- Encourage the formation of riparian marsh wetland.

10.2 LEVEL 2 PROTECTION – GENERAL AWARENESS MITIGATION MEASURES

The disturbance footprint for the Project will include potential nesting habitat for many migratory bird species (ground, tree and shrub nesters). The presence of natural upland and wetland habitat in the disturbance footprint increases the chances of the presence of a nesting migratory bird species onsite.

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Nests could be located in trees or shrubs or on the ground. An active nest can be identified by:

- the presence of birds or eggs in a nest;
- adult birds carrying food or nesting materials to a specific location; and/or
- adult birds defending territory through singing, screeching, or diving.

When one or more of these indicators are noted, measures will be undertaken to identify if the potential location of the nest is in the disturbance footprint or within a recommended setback buffer. If the nest is not physically detected, the area will be considered a potentially active nest and have a recommended setback buffer.

See Appendix B for the Avifauna Management Field Guide.

10.3 LEVEL 3 PROTECTION – DIRECTED SURVEY PROTOCOLS

Additional avifauna mitigation measures include surveys of the construction areas prior to activity including activity surveys of known raptor nests, aerial search for additional nests (either previously unknown raptor nests or nest of other species), and ground surveys to identify breeding migratory bird species within the areas.

10.3.1 Ariel Surveys

Helicopter surveys for active raptors (Landbirds) nests will be completed during late May through early June of the area of interest. Results will be reported to LCP Avifauna coordination personnel, and Construction Managers who will communicate findings to the On-site Environmental Monitors. Line transects are to be flown along 3 transect lines covering 100% of the area to be cleared.

10.3.2 Ground Surveys

Trained surveyors will complete ground searches for avifauna nests approximately from 15 May to 31 July, though this is dependent on regional conditions and could change season to season. The surveys will be conducted <7 days prior to clearing activities. This may be adjusted later in the nesting season. The census techniques will vary according to habitat but will be based on 100% coverage of the area of

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interest. Crews of varying sizes will walk transects, approximately 10m apart, based on vegetation type and terrain.

Active and potentially active nests will be identified using the criteria identified in Section 8.2 according to species with information collected based on Maritime Bird Breeding Atlas Nest Record Card (Bird Studies Canada, 2006). The area of interest will only be cut after the survey team has cleared the area after completing their search. No cutting will be permitted within established setbacks until the survey team has returned to the setback area to confirm fledging within the appropriate timeframe for the species in question found at the active nest. An experienced avifauna biologist will be on each survey team and available for assistance and consultation following the initial surveys and throughout the identified period for the project.

In addition, avifauna survey personnel and construction personnel will be instructed in the identification of nests that may not be readily visible or well concealed. This includes awareness of behavioural cues that suggest the presence of an active nest, even if it cannot be seen. These include singing males, pairs observed together (including courtship and copulation), adult birds repeatedly carrying nest materials or foods to a specific location, aggressive defense of a location (against other birds or people), or the presence of recently fledged birds (often with some tufts of down feathers remaining, or begging persistently for food). Shorebirds may also attempt to lure intruders away from an active nest with a broken-wing display. Table 9-1 provides an overview of the types of nests that may be expected within the Project area.

Table 9-1 Identification of Active Avifauna Nests

Nest Type	Location	Typical Species	Notes
Open cup – small nests woven from coarse plant fibres such as grass stems, leaves and bark strips	Usually in shrubs or trees, but can be on the ground; depends on foraging and shelter preferences of species	Flycatchers, vireos, thrushes, warblers, sparrows, finches, blackbirds	Often concealed in forks of trees, within shrubs, or under overhanging forbs or other dense vegetation; difficult to see in trees
Domed - ground nests	Ground	Some warblers and	Often well camouflaged and difficult

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Nest Type	Location	Typical Species	Notes
with grasses or other vegetation used to cover the nest, leaving an entrance hole on one side		sparrows	to detect; best found through behavioural cues
Bank – burrows in sandy slopes	Sand banks, especially along rivers	Bank Swallow, Belted Kingfisher	Usually the nest holes can be seen from a distance; bird activity is easy to monitor from a distance
Cavity – excavated inside a rotting trunk or stump	On the main trunk of living or dead trees	Woodpeckers, chickadees, nuthatches, Tree Swallow	Used by different species over time; look for woodpecker activity (holes and missing bark) on nearby trees
Stick – large nest made of small to large sticks, lined with bark and grasses	On or near the top of large trees	Osprey, Bald Eagle, Red-tailed Hawk, Great Horned Owl, Common Raven	Visible from the air, difficult to detect from below; nest may be built by one species and then adopted by another; often used for several years
Scrape – lightly excavated depression on the ground, often lined with grasses, down, or other material from nearby	Wetland edges	Dabbling ducks, geese, shorebirds	Well concealed; females may remain on nest hoping that their plumage provides good camouflage (better than allowing the eggs to be visible)
Floating – clumps of aquatic vegetation upon which a loose cup platform is built	Over water, often in sheltered part of a wetland	Waterfowl	Relatively poorly constructed and can look like a naturally occurring clump of vegetation

Source: The Cornell Lab of Ornithology 2012 Available: <http://www.allaboutbirds.org/Page.aspx?pid=1189>

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11 RECORDS

If a potentially active nest has been identified during surveys, the setback buffer needs to be established around the nest site to ensure no further disturbance of the nesting species occurs. The size of the buffer is based on the nest setback guidelines recommended by Environment Canada (M. Gahbauer, pers. comm.) or the Government of Newfoundland and Labrador for species of management concern (NLDEC 2012a). Setback distance for nests of species not of management concern is 30 m for passerine nests and 100 m for waterfowl/waterbird nests. Any adjustments to the recommended setback buffers need to be discussed with the LCP on-site environmental monitor.

In forested and non-forested habitats, conspicuous flagging or other suitable marking will be used to mark the buffers with appropriate direction and bearing recorded in the field notes. If an occupied nest is discovered on or adjacent to the disturbance footprint during construction, activities within a minimum of 30 m from the nest should not occur until the Environmental Inspector has been notified by the Construction Manager. Once the Environmental Inspector is notified, a wildlife monitor will be dispatched to the site (if not already present) to identify the nest or bird species and determine the appropriate mitigation in consultation with the Construction Manager and appropriate LCP personnel. If a nest is found adjacent to an existing trail, vehicles will be allowed to continue using the trail but will be prohibited from stopping within the recommended setback buffer.

11.1 AVOIDANCE OF ACTIVE RAPTOR NESTS

Buffers for known active raptor nests include:

- Replace physically disturbed Osprey or Bald Eagle nests with artificial platforms;
- Restrict activities within 200 m of active raptor nests; and
- Restrict clearing within 800 m of active raptor nest.

11.2 PROTOCOL FOR REMOVING EXCLUSION AREAS

In order to reduce the potential for nest abandonment or failure, monitoring or rechecking of an identified active nest will occur after the estimated completion of the fledging period (or when the young have left the nest). Depending on the nesting stage (i.e., incubating or fledging) observed during the nest search, the timing of follow-up nest checks will be determined using literature-based estimates of the species-specific incubation and

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fledging periods (i.e., approximate number days for incubation and/or fledging to be completed). Inactive raptor nests will be relocated, as required, to support construction activities.

12 REPORTING

LCP will institute a series of reporting and documentation initiatives regarding activities and results related to the scope of this Avifauna Management Plan. On a daily basis a suitable form would be completed by the On-Site Environmental Monitor and/or on-site survey team member during approximately 1 May to 31 July (and as appropriate thereafter regarding avifauna) documenting the following:

- Instance of personnel briefing and training;
- Results of dedicated aerial survey for tree-nesting raptors or ground surveys for other nesting avifauna;
- Locations of any active nests and mitigation measures implemented to address potential incidental take;
- Documentation that such nests are no longer active (i.e., post-fledging) before proceeding with construction activities; and
- Documentation of all communications with appropriate federal and provincial authorities.

These daily reports will be kept onsite with active nests identified in subsequent daily briefings and other notifications regarding stated avoidance measures.

An annual report detailing the implementation of this plan will be compiled and posted to the LCP website.

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APPENDIX A: NEST PROTECTION PROCEDURES

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The LCP Environmental Protection Plan indicates the following measures for raptor nests:

- Replace physically disturbed nests with artificial platforms;
- Restrict activities within 200 m of active raptor nests; and
- Restrict clearing within 800 m of active raptor nest.

Clearing and access plans for the Labrador-Island Link limit the ability to maintain these buffers or relocate nests prior to nesting season largely due to remote locations of the nests (i.e. there is no access to the nest locations to relocate prior to LCP access construction).

Raptor Nests

The following measures are proposed to limit the impact of construction on raptor nests:

Active raptor nest within RoW at accessible location

1. Create bypass trail with a 100 m buffer on the nest. This bypass should be expedited to limit interaction with the nest within the 800 m buffer.
2. Constant monitoring of the nest is required during bypass construction. If the bird appears to be in danger of vacating the nest, construction should be delayed until bird settles on the nest.
3. Nest can be relocated and the tree and buffer can be cleared following the nesting season, as per conditions of the Wildlife Act permit and procedures discussed with Nalcor Energy environmental personnel.

Active raptor nest within RoW at remote location or where bypass is not feasible

1. Clear up to nest with constant monitoring. If the bird is in danger of vacating the nest construction should be delayed until bird re-settles on the nest.
2. Nest will have to be relocated with consultation of ornithologist to a nearby location accessible by appropriate equipment (i.e., excavator). Relocation to utilize active relocation procedures as discussed with Nalcor Energy environmental personnel.
3. Nest can then be cleared with constant monitoring of the relocated nest. This clearing should be expedited to limit interaction with nest and increase probability of successful relocation.
4. Follow up and monitoring protocol to be implemented to confirm successful relocation.

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SONGBIRD AND WATERFOWL NESTS

This procedure will not change from the Avifauna Management Plan.

Setback distance for nests of species of management concern is 75 m, 30 m for passerine nests and 100 m for waterfowl/waterbird nests. Any adjustments to the recommended setback buffers need to be discussed with the appropriate regulatory body.

In forested and non-forested habitats, flagging is used to mark the buffers with appropriate direction and bearing recorded in the field notes. If an occupied nest is discovered on or adjacent to the disturbance footprint during construction, activities within a minimum of 30 m from the nest should not occur until the OSEM has been notified by the Construction Manager. Once the OSEM is notified, a wildlife monitor will be dispatched to the site (if not already present) to identify the nest or bird species and determine the appropriate mitigation in consultation with the Construction Manager and appropriate LCP personnel. If a nest is found adjacent to an existing trail, vehicles will be allowed to continue using the trail but will be prohibited from stopping within the recommended setback buffer.

Protocol for Removing Exclusion Areas

In order to reduce the potential for nest abandonment or failure, monitoring or rechecking of an identified active nest will occur after the estimated completion of the fledging period (or when the young have left the nest). Depending on the nesting stage (i.e., incubating or fledging) observed during the nest search, the timing of follow-up nest checks will be determined using literature-based estimates of the species-specific incubation and fledging periods (i.e., approximate number days for incubation and/or fledging to be completed). Inactive raptor nests will be relocated, as required, to support construction activities.

Protocol for Songbird Nests in Areas of Critical Infrastructure

If a nest exists in an area in which the nest buffer cannot be avoided during the nesting season the following protocol will apply:

1. On-site construction management will contact On-Site Environmental Monitor to confirm the necessity of interacting with the identified buffer.
2. Avifauna teams will be directed to return to the nest location and confirm the exact location of the nest.

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3. The following options will be confirmed by Regulatory Compliance Lead (or designate), Clearing and Access Construction Manager (or designate) and On-Site Environmental Representative (OSEM or Avifauna Rep) depending on certain factors (e.g. species, time of year, egg presence):

- a. Reduce buffer
- b. Maintain buffer
- c. Attempt relocation

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APPENDIX B: AMP GUIDE QUICK REFERENCE

Avifauna Management Plan Field Guide for Nalcor Energy's Lower Churchill Generation Project

Nalcor Energy developed an Avifauna Management Plan (AMP) to mitigate potential disturbance to migratory and resident avifauna (i.e. incidental take) based on federal and provincial legislation. A component of the AMP includes directed surveys. Ground nest surveys are to be conducted prior to any vegetation clearing during the sensitive breeding season. Setbacks are established when active nests are encountered during surveys based on the following decision framework (Figure 1) and approximate bird breeding periods (Figure 2-4).

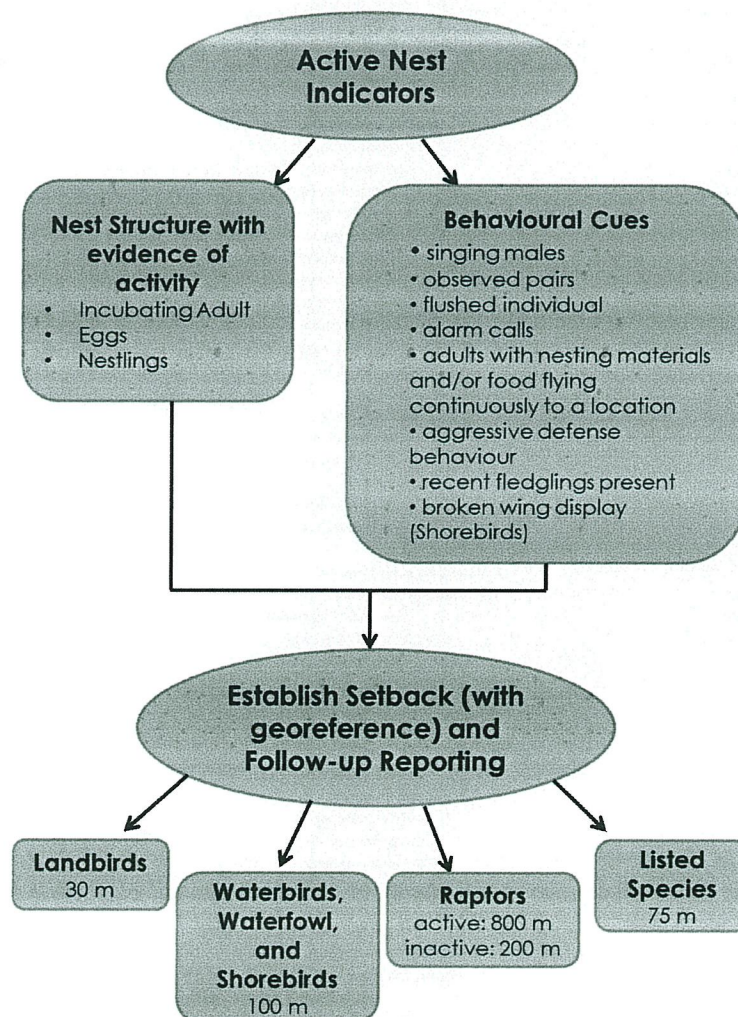


Figure 1 Decision Framework for Establishing an Active Nest Setback

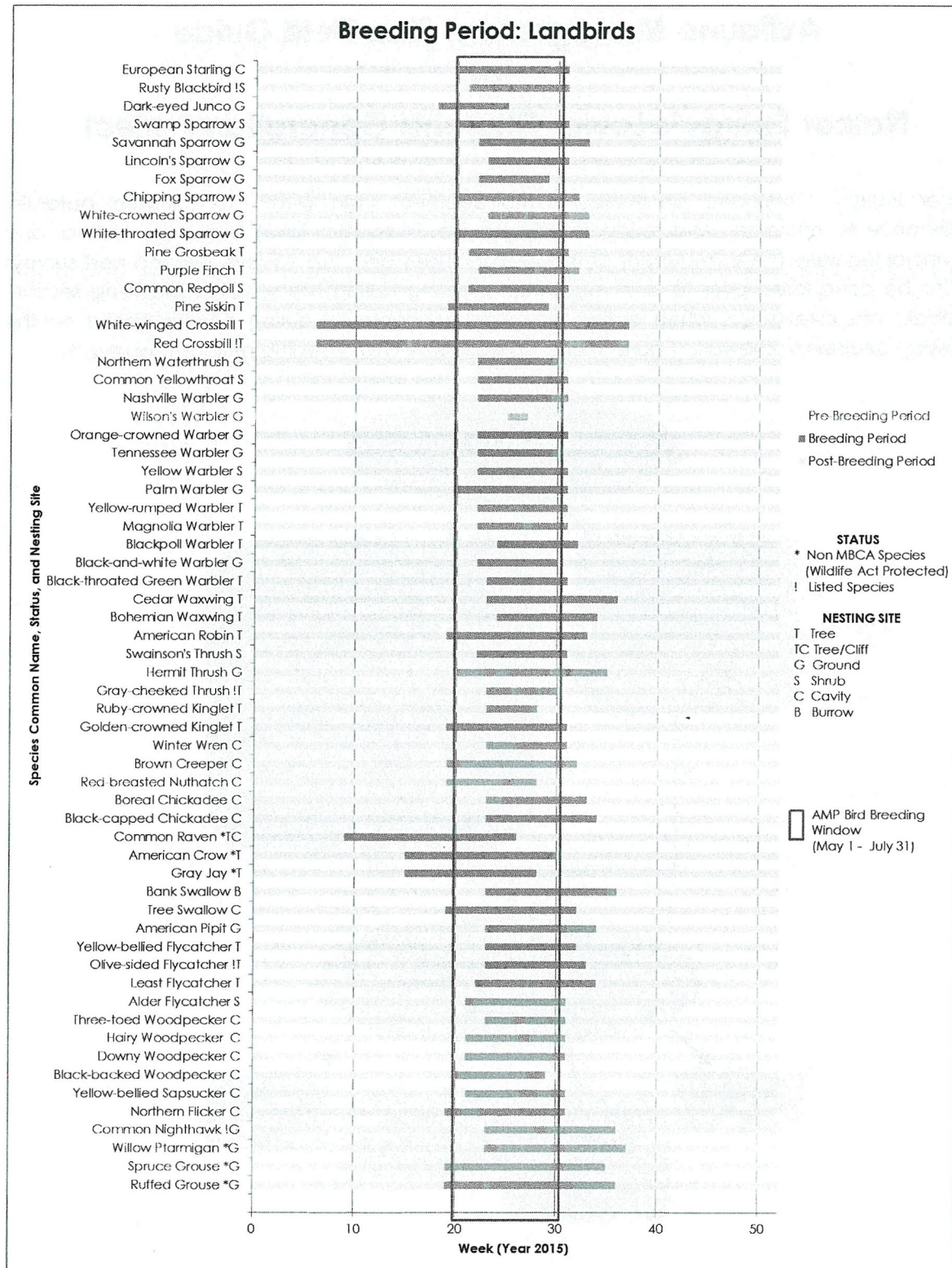


Figure 2 Approximate Breeding Period for Landbirds Based on the Avifauna Management Plan Mitigation Window

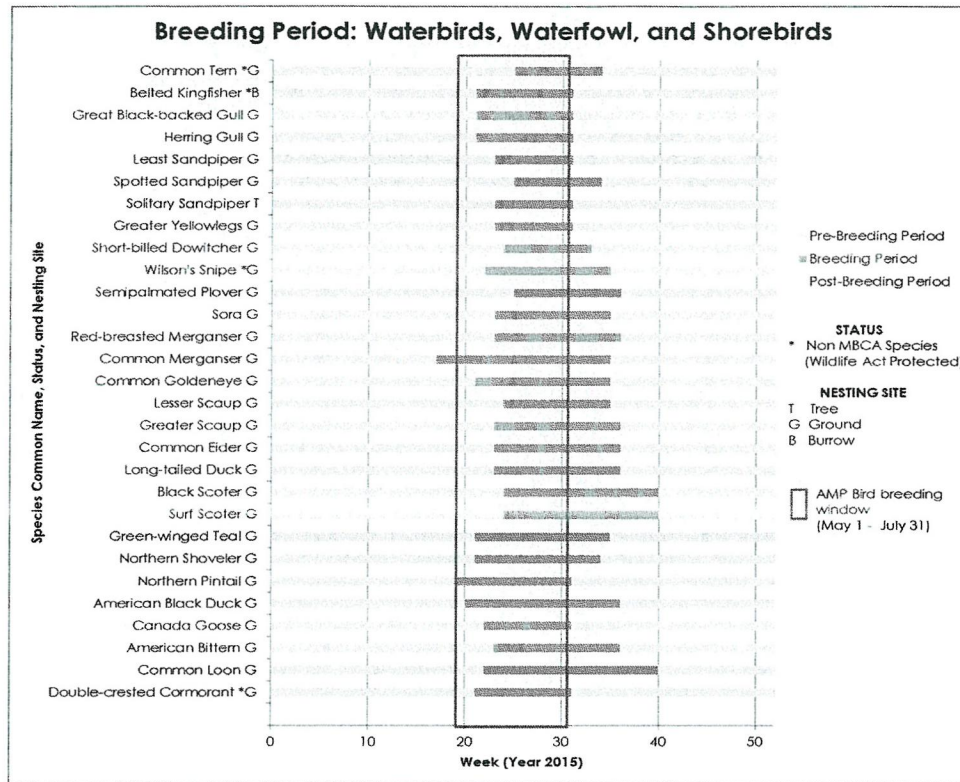


Figure 3 Approximate Breeding Period for Waterbirds, Waterfowl, and Shorebirds Based on the Avifauna Management Plan Mitigation Window

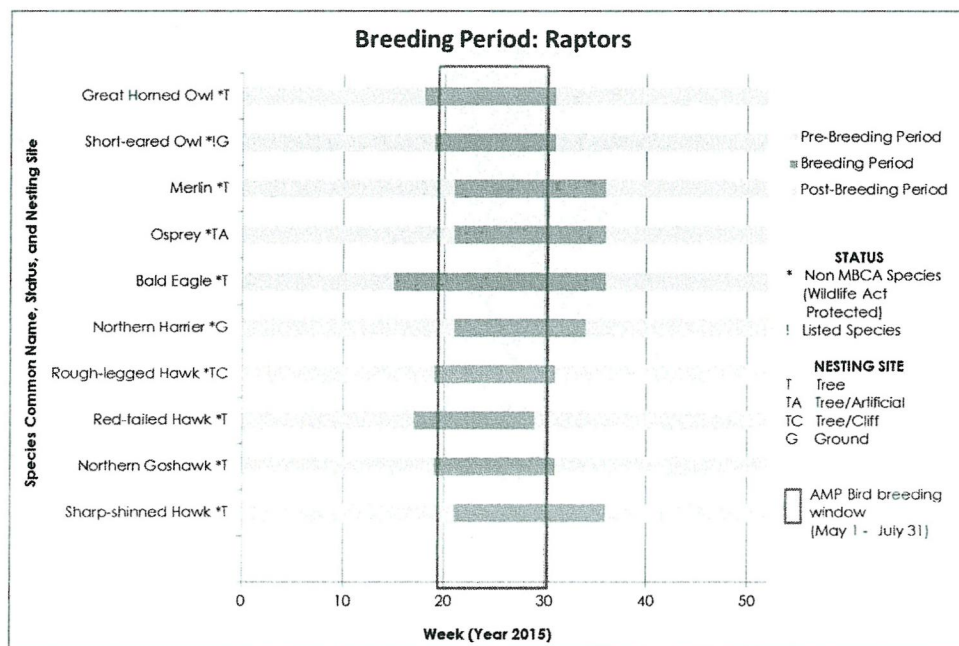


Figure 4 Approximate Breeding Period for Raptors Based on the Avifauna Management Plan Mitigation Window