Applying Beneficial Management Practices for At-Risk Birds

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DALHOUSIE UNIVERSITY
Inspiring Minds

Five focal Species at Risk (SAR)

Wet forests

Canada Warbler

Mixed-wood Swamps with tall shrub layer

Olive-sided Flycatcher

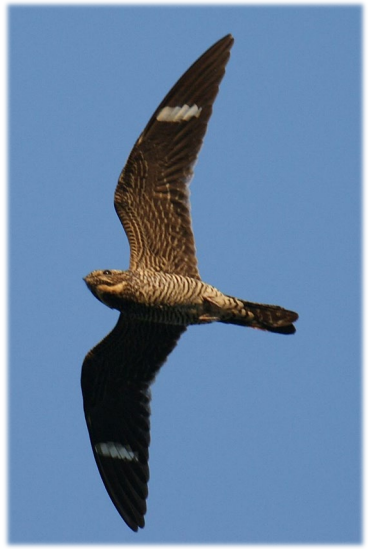
Mature, moist/wet spruce forest, burns

Rusty Blackbird

Wetland-stream-forest complexes

Eastern Wood-Pewee

Mature upland mixedwood



Common Nighthawk

Harvested, burned, sparsely vegetated areas, barrens, gravel

Project rationale

- Recovery of SAR bird populations depends on access to quality breeding habitat
- The bulk of the breeding populations of our five target SAR are dispersed across working forest landscapes in Nova Scotia
- Thus protected areas are insufficient – recovery depends on breeding habitat conservation within working forests

Project Goal and Objective

- Goal:
  - To work together to find solutions that benefit both the birds and forestry.
- Objective:
  - To develop and test, in a collaborative and iterative process, a set of Operational Guidelines for Beneficial Management Practices (BMPs) for five landbird Species at Risk (SAR) in Nova Scotia.

Olive-sided Flycatcher perched on a snag in a coniferous swamp / open wetland complex

Draft BMPs for SAR in Nova Scotia – Forestry Series

NS Beneficial Management Practices Series

- Series of 2-page Fact Sheets for SAR
- Development led by Katie McLean, CARP
- Based on literature review and local knowledge
- Approved by DNRR and ECCC for use as working drafts for this project
- We also distributed these to forestry professionals and the public starting June 2021

Nova Scotia Species At Risk Beneficial Management Practices Series

Version 1, November 2021

Canada Warbler
Cardellina canadensis

STATUS: Threatened, Endangered

FORESTRY

Occurs throughout Nova Scotia. Winters in Venezuela, Columbia, Ecuador, Peru and Brazil. Declined by 85% over the last 40 years.

Population Range

© SIMON D'ENTREMONT

Adult male with a visible necklace of black streaks across the breast

© RONNIE ENTREMONT

Adult female

© CLARA FERRARI

An example of suitable breeding habitat for Canada Warbler

SPECIES DESCRIPTION

- The Canada Warbler is a small songbird (12-15 cm long) with a thin pointed bill.
- Males and females have bluish-grey upperparts, black markings on the head, and a prominent necklace of black streaks across the yellow breast. On females and juveniles, these markings are less distinct, and juveniles are duller in colour in comparison to adults.
- The Canada Warbler primarily feeds on insects, including beetles, mosquitoes, flies, moths, caterpillars and spiders.

HABITAT DESCRIPTION

- Found in moist/wet forests with a broken canopy and well-developed deciduous shrub layer.
- In Nova Scotia, most often found in swamps with red maple, spruce, cinnamon fern, and sphagnum moss.
- Breeds in Nova Scotia from late May to mid-August.
- Nests are well-concealed by vegetation, placed on uneven forest floors, among downed woody material (logs, branches, stumps, and root masses) covering >10% of the ground.

THREATS

- Overwintering and breeding habitat loss and degradation due to urban development, agriculture, forestry, and wetland drainage.
- Habitat fragmentation caused by forestry activities and road development.
- Over-browsing of the understory, reducing cover needed for nesting.
- Reduced availability of insect prey.
- Collisions with windows and vehicles.

KEY TERMS

Habitat fragmentation:
Habitat fragmentation is the process during which a large expanse is transformed into a number of smaller patches of smaller total area separated from each other. Fragmentation also leads to an increase in the proportion of habitat edges in relation to total area.

Wetland hydrology:
Wetland hydrology is the science of how water moves into and out of a wetland. These processes can take place on the surface or underground. For example, forests help slow-down the movement of surface water from rain or snowmelt, which allows the water to absorb into the soil and prevent erosion.

HOW YOU CAN HELP (BENEFICIAL PRACTICES)

- Learn to identify Canada Warbler and report all observations (see "Report Sightings").
- To reduce risks to breeding Canada Warbler and their nests, avoid harvesting and silvicultural activities during the nesting season (June 1-August 15), if possible.
- Learn to recognize preferred habitat for Canada Warbler on your property. Forested wetlands may not have visible water, but will have water-saturated soils and wetland adapted plants like sphagnum moss. Mark these areas so that activities can be planned around them.
- Minimize compaction of soil and removal of ground vegetation, moss cover, downed woody material, stumps, hummocks, and root masses of ferns and trees. These are important habitat features that are used to conceal nests and offer protection to nesting birds.
- Harvest on frozen ground to minimize rutting and compaction which negatively impacts soil health and can alter hydrology.
- Avoid harvesting or road building activities within wetlands and wet forest sites. If possible, leave a buffer of at least 50 metres around wetland edges.
- Avoid activities that will alter wetland hydrology. For more guidance on this topic, see "Resource Roads and Wetlands: A Guide for Planning, Construction and Maintenance." https://boreal.ducks.ca/publications/resource-roads-and-wetlands-a-guide-for-planning-construction-and-maintenance/
- If possible, use uneven aged management systems. Retain some mid-story trees scattered within openings. An uneven forest stand is one that has intermingling trees that differ markedly in age. An uneven-aged stand contains at least three well-defined age classes.
- Plan blocks to minimize the amount of edge created which helps reduce "edge effects" such as nest predation.
- Maintain a mix of hardwoods and softwoods at stand and landscape levels by allowing natural regeneration and limiting hardwood herbicide use on softwood sites.
- Implement thinning and/or crop-tree release after the stand height exceeds 4.5-6 metres to open the canopy and enhance understory structure.
- In harvest areas >1 hectare, retain trees that can be used as singing/visual display centres. This can be done by retaining at least 12 standing trees/hectare that reach at least 1 m above the sub-canopy and range from large saplings to trees <15 metres in height. These display centres can be dispersed individually or grouped in 5-10 clumps (depending on conditions and tree species), with at least 4.5 metres of space between them.
- Protect patches of advanced regeneration and woody material by minimizing travel within harvest blocks and maximizing trails pacing and machine reach. Patches of about 0.1-0.2 hectares can mature into future territory cores.
- If practical, leave tree tops and limbs on site to enhance woody debris and forest floor structure.
- Limit beaver trapping where they are not damaging roads or high value timber, as they create irregular wet habitats used by Canada Warblers.
- To learn more about reducing risk to migratory birds review Environment and Climate Change Canada's "Guidelines to reduce risk to migratory birds."
- Avoid or limit the use of pesticides that may negatively affect non-pest

REPORT SIGHTINGS

When possible, report any of your observations of species at risk. Details such as time, date, location (Geographic or UTM coordinates) as well as photos are valuable additions to all reports.

Contact: 1-866-727-3447, *sightings@speciesatrisk.ca* AND the Nova Scotia Department of Natural Resources and Renewables, *biodiversity@novascotia.ca*.

Project Partners:

Mersey Tobeatic Research Institute; Clean Annapolis River Project; Nova Scotia; NSFA

Examples of suitable breeding habitat for Canada Warbler

TO LEARN MORE

To learn more about the Canada Warbler or other species at risk view the **Species at Risk in Nova Scotia, Identification and Information Guide** available online at *http://www.sarguide.speciesatrisk.ca*

Landbird species at risk in forested wetlands website: *http://landbirdsar.merseytobeatic.ca/*

Additional Resources for woodlots with Canada Warbler:

Westwood, A., C. Harding, L. Reitsma, & D. Lambert. (2017). Guidelines for Managing Canada Warbler Habitat in the Atlantic Northern Forest of Canada. High Branch Conservation Services, Hartland, VT.

Lambert, D., & S. Fraccio. (2005). Canada Warbler Population Status, Habitat Use, and Stewardship Guidelines for Northeastern Forests. VINS, Woodstock, VT.

Content and design from the **Species at Risk in Nova Scotia, Identification & Information Guide, 2nd Edition** used with permission of Mersey Tobeatic Research Institute.

This project was undertaken with the financial support of:
Ce projet a été réalisé avec l'appui financier de :

Environment and Climate Change Canada / Environnement et Changement climatique Canada

Examples of BMPs

All SAR:

- Avoid silviculture during the nesting season
  - Dates are different for each species - see nesting calendars (ECCC and Birds Canada)
- Avoid use of insecticides and herbicides

Canada Warbler female nesting on the ground

Wet Forest SAR:

- Leave a 50 m buffer around streams, wet forest and open wetlands
- Avoid activities that alter wetland hydrology, like road building
- Harvest on snow or frozen ground
- Avoid harvesting in forested wetlands

Additional BMPs in common for the forested wetland SAR

- Avoid activities that may alter wetland hydrology
- Avoid harvesting and road building in wetlands
- If harvesting, do so only on frozen ground
- Leave a 50 m buffer around wetlands, open wet areas, and streams

Olive-sided Flycatcher

Canada Warbler

Rusty Blackbird

Treed bogs

Swamps

Streams, wet areas

Operationalizing the BMPs

- Draft BMPs intended as a guide when planning harvesting <u>without needing to know that the SAR is present</u>
  - ➢ Ways to maintain or promote habitat for a particular SAR
- Our project aimed to test the BMPs at sites with known SAR
  - ➢ Do the BMPs retain habitat elements needed to support a specific SAR?
- Operational protocols were developed with forestry partners
  - ➢ Incorporated into revised harvest plans

SAR Protocols

- If SAR not found spontaneously in suitable habitat, used 30 s of conspecific playback to increase detection rates
- Determined SAR locations by adjusting observer location for distance and direction to bird
- Deployed Autonomous Recording Units (ARUs) to detect additional SAR
- Also monitored control sites (no harvest planned) where SAR were known to breed

AudioMoth ARU (Autonomous Recording Unit) deployed on a tree

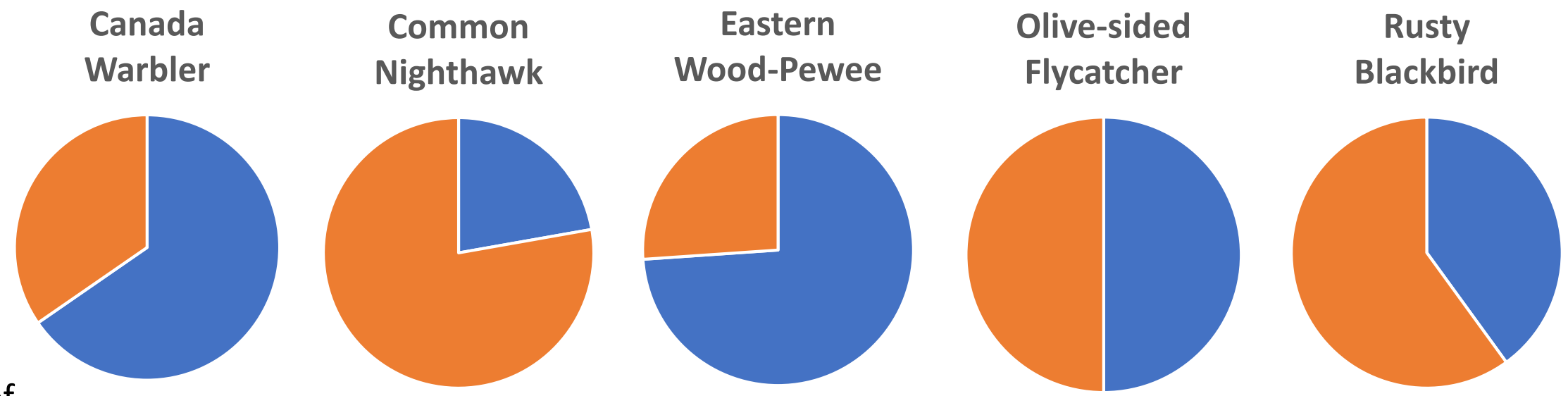
https://www.openacousticdevices.info/

ARUs are useful for detecting SAR

Overall, 54% of the individual SAR birds found on crown lands were detected only in ARU recordings

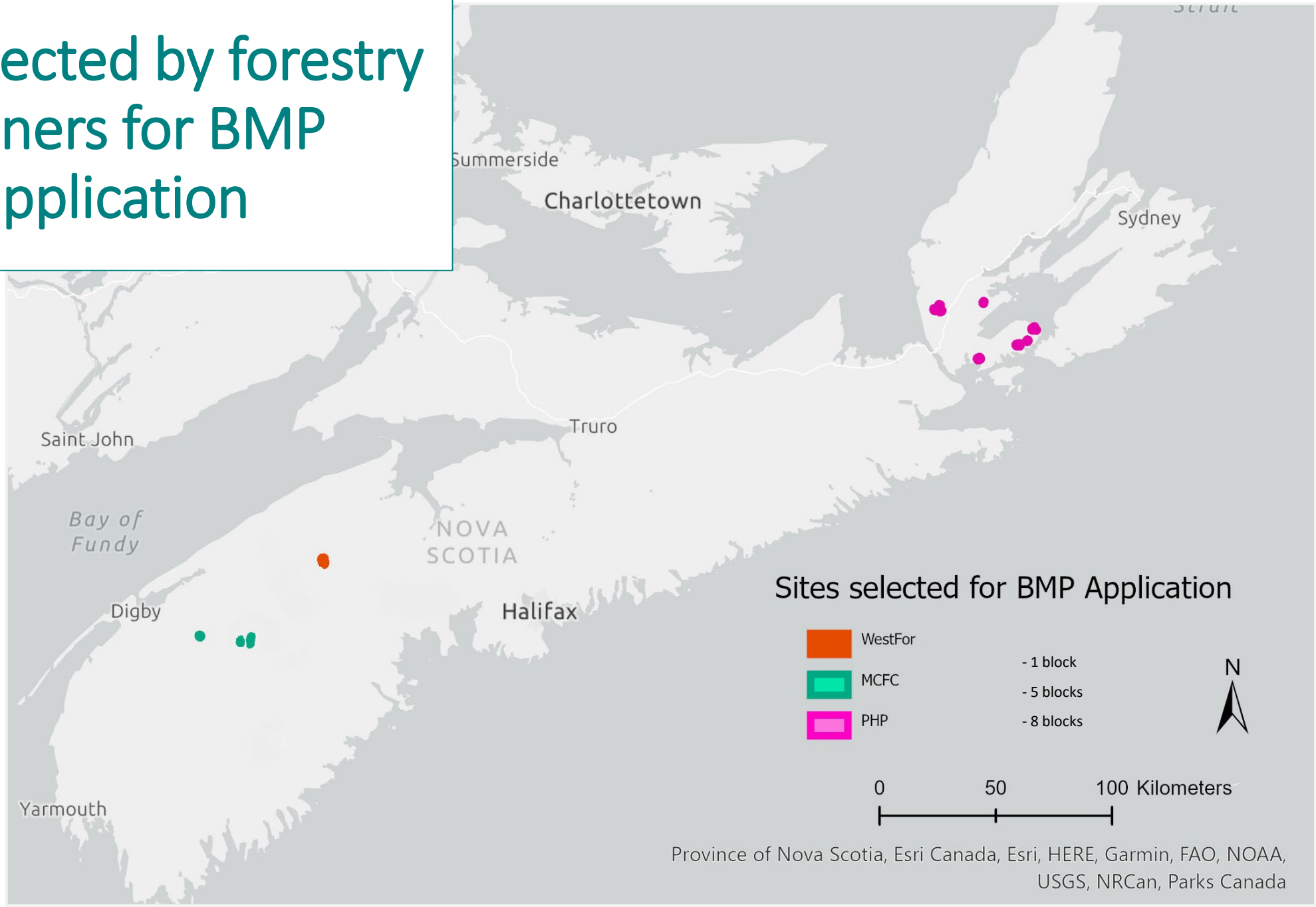
Detected in field surveys

Detected only in ARU recordings



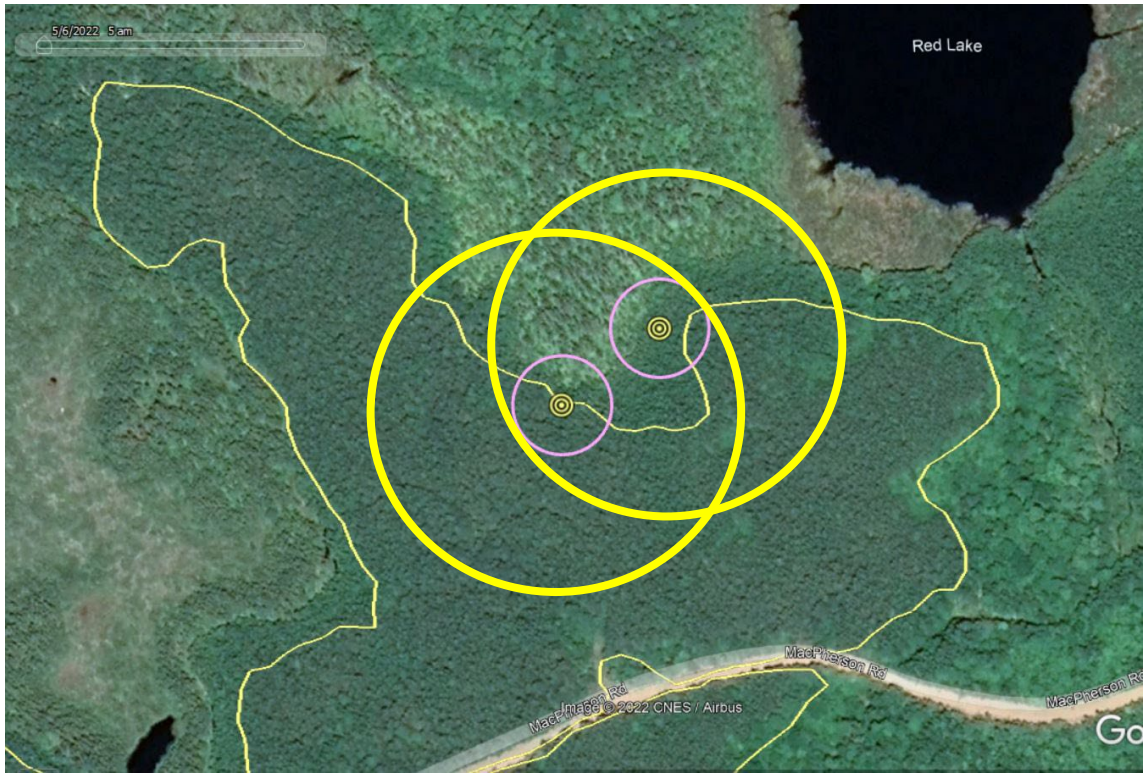
No. of Individuals:	26	54	23	50	10

Sites selected by forestry partners for BMP application

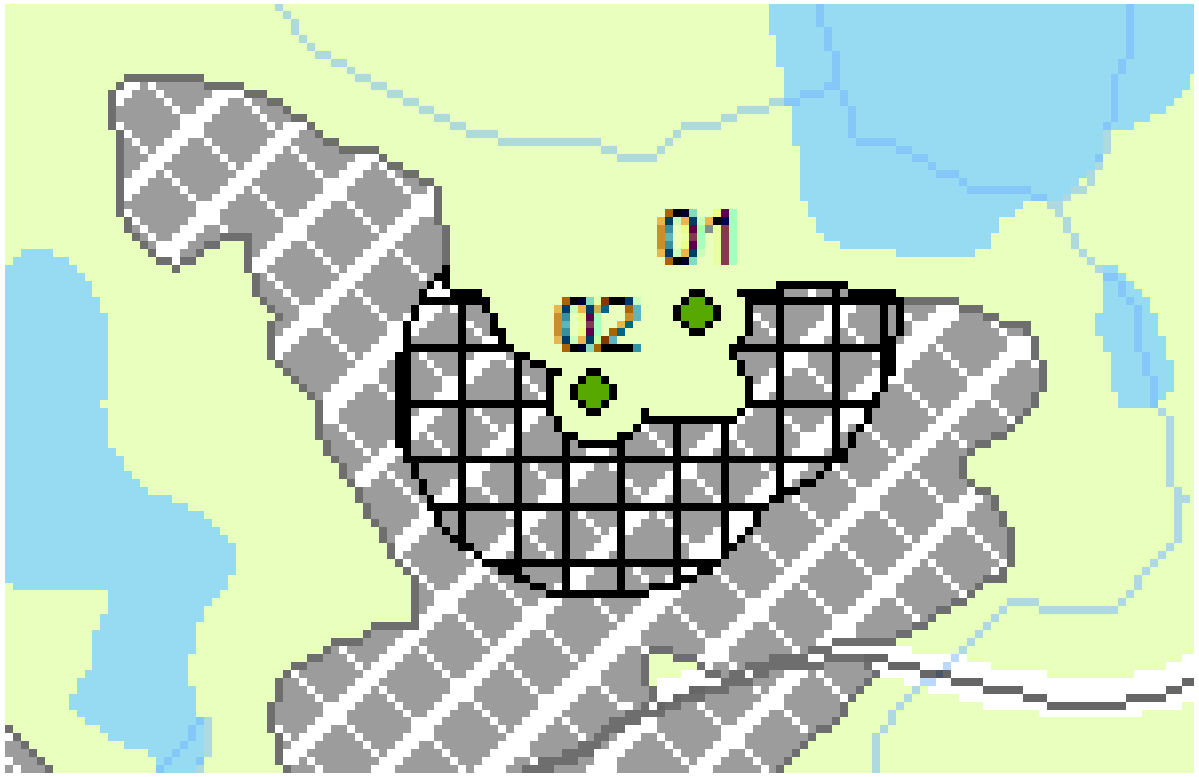


Locating the BMP for Canada Warblers at Urquhart Rd

Map from field survey



Map in modified harvest plan

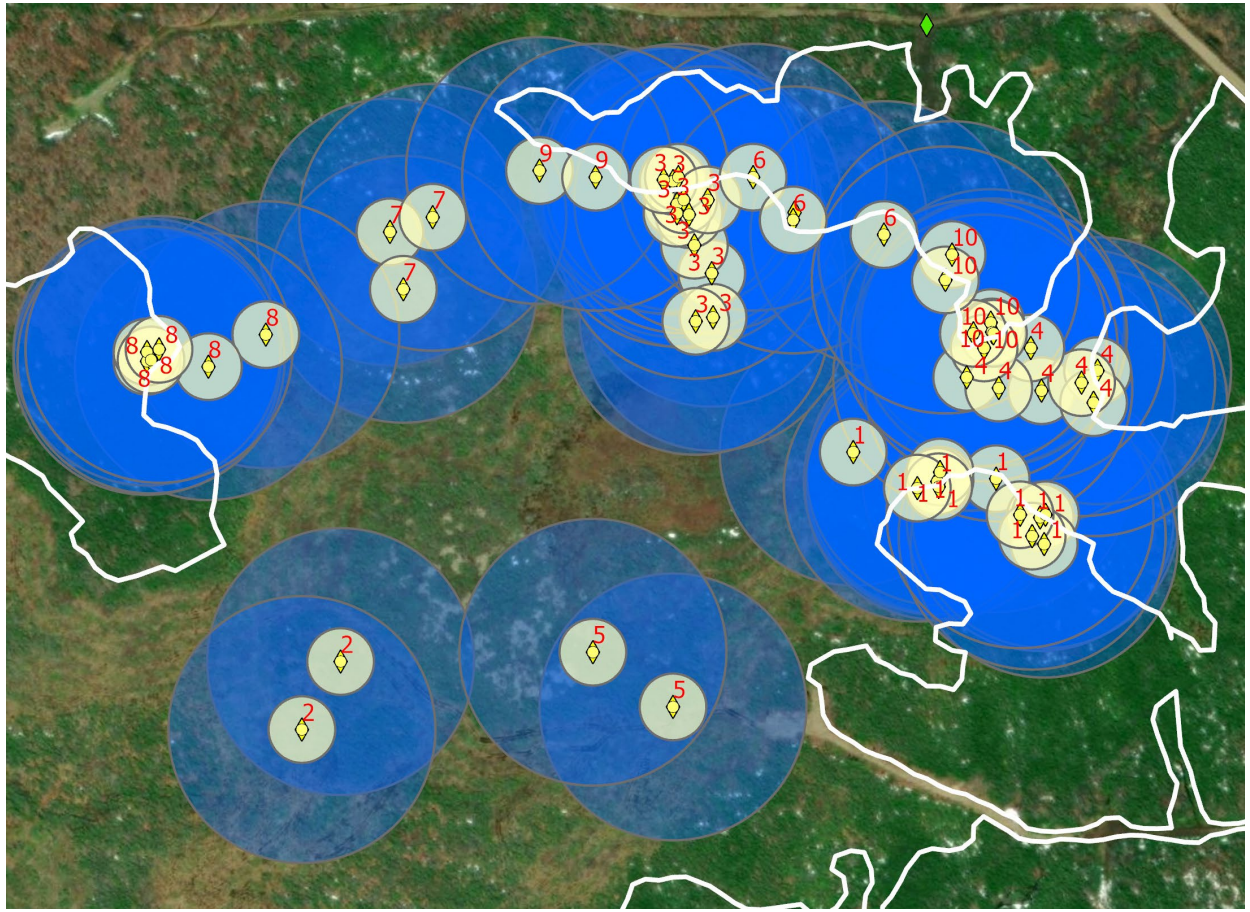


Pink circles: 25 m buffers around bird locations (no-harvest buffers)

Yellow circles: 100 m buffer (Apply BMPs in the 25-100 m beyond the no-harvest buffer)

Canada Warbler BMP recommendations

25-m no harvest buffers (small beige circles)



MacIntyre Mountain Rd site

Within the Canada Warbler BMP buffers (blue circles, 25-100 m around the birds):

- Retain trees for use as song perches: at least 12 standing trees/ha dispersed individually or in small clumps, 4.5 m apart and at least 3 m above the subcanopy.
- Minimize disturbance to ground vegetation, moss cover, downed woody material, stumps, hummocks, and root masses of ferns and trees.
- Leave tree-tops and limbs on site to enhance woody debris and forest floor structure.
- Avoid the use of pesticides that negatively impact insect prey and herbicides that reduce the shrub component.
- Locate trails a distance from the no-harvest buffer equal to boom length of the harvester.

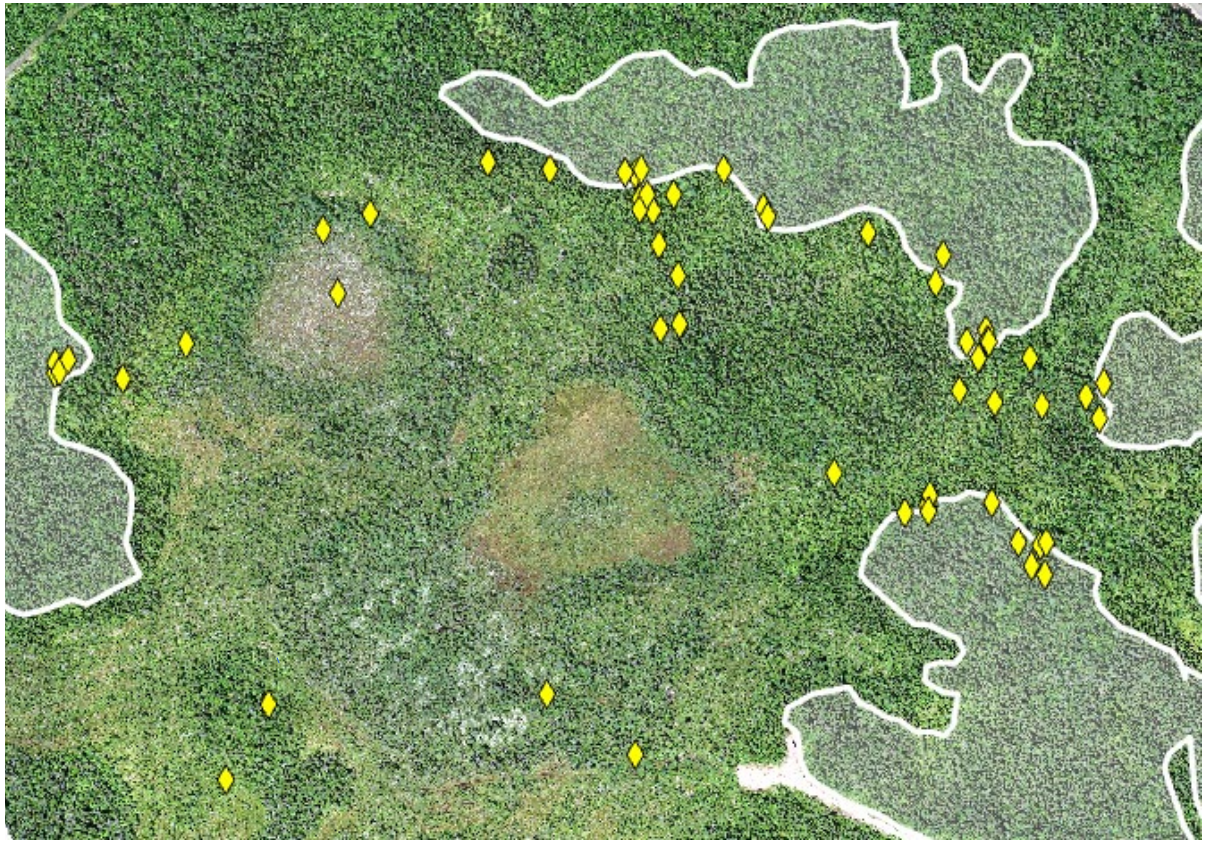
Canada Warblers are typically found in wet forest, often near wetlands, but their territories often extend into upland forest

Canada Warbler locations

Harvest blocks

100 m

Drone image



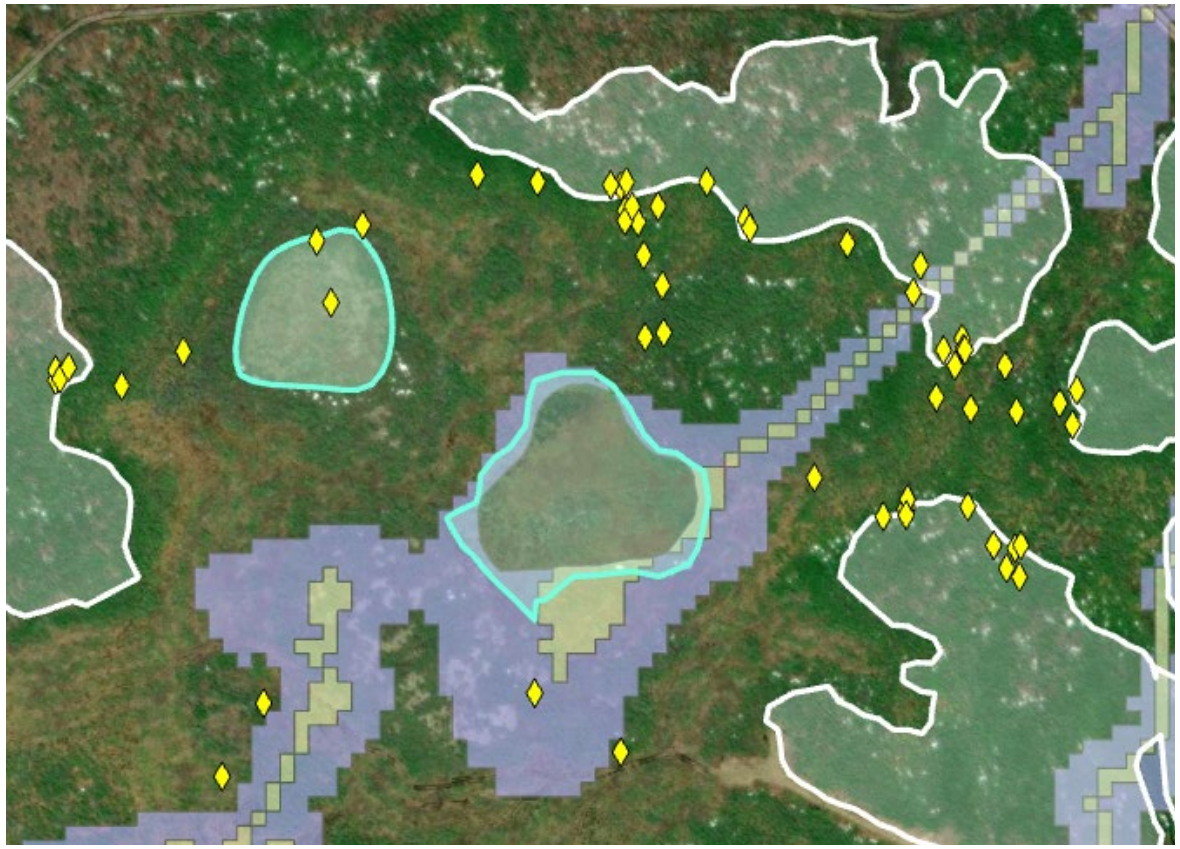
Open wetlands (forest inventory)

Depth to water table

Less than 10 cm

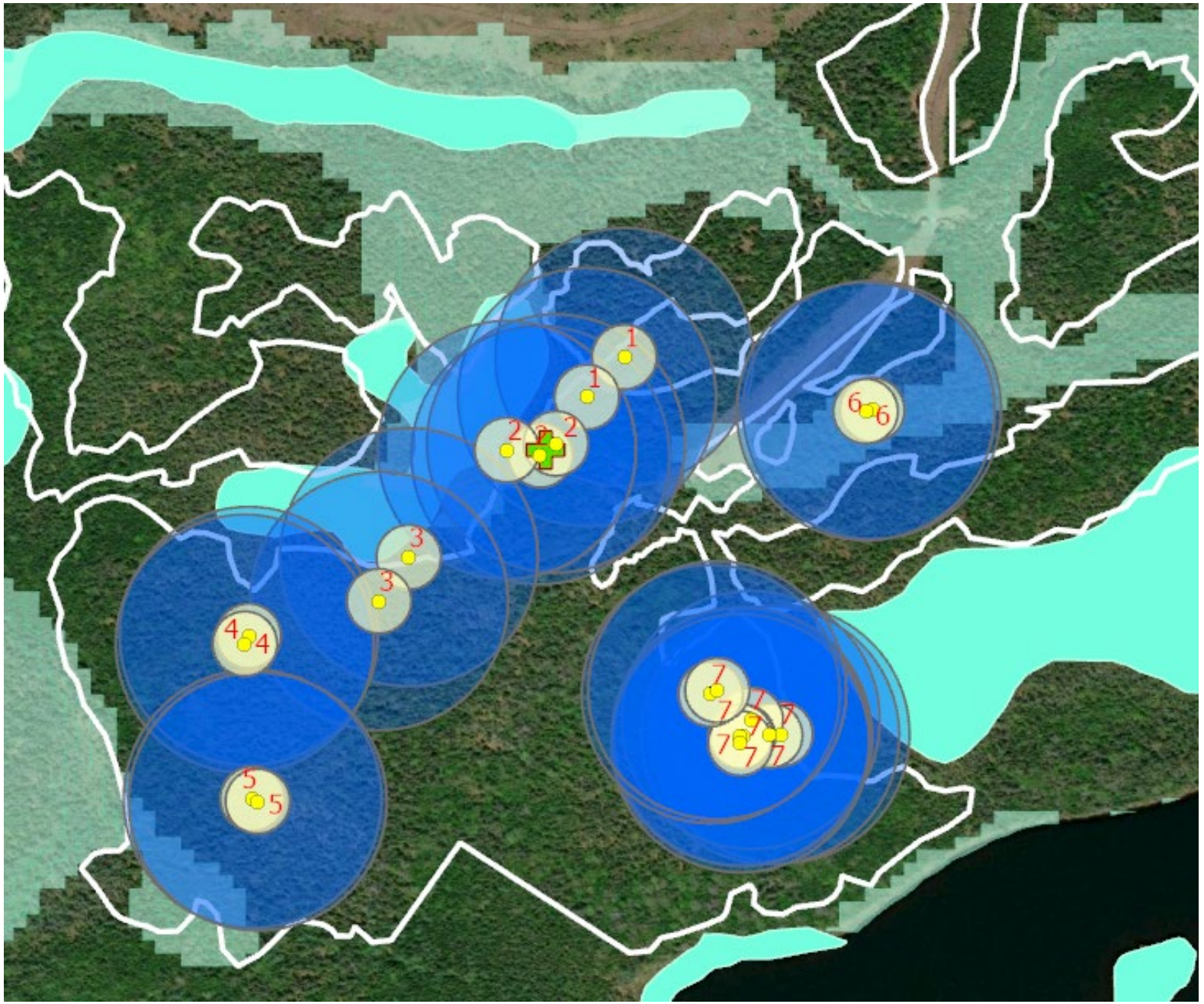
Less than 50 cm

Satellite image



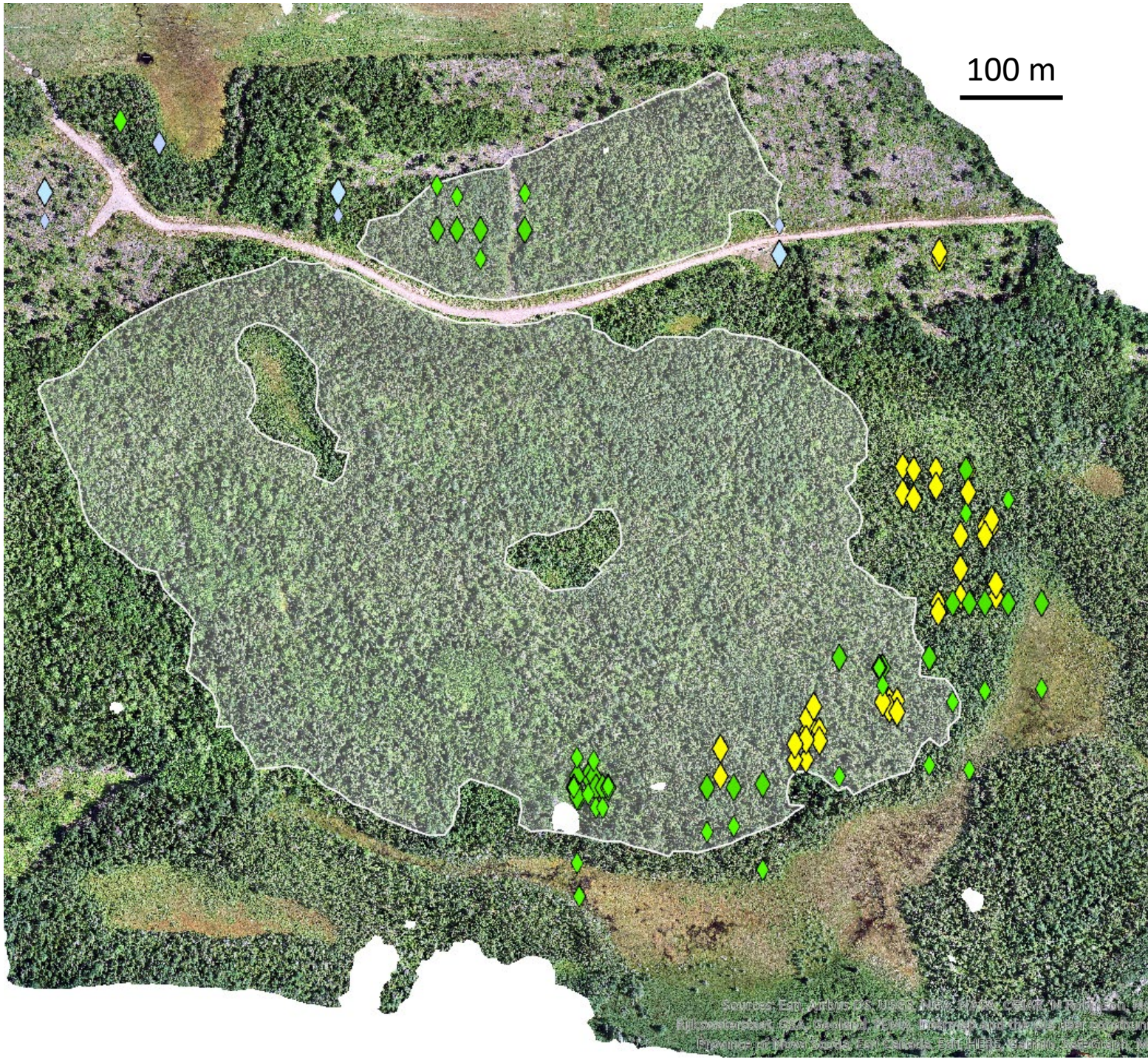
Whites Lake

- GIS indicated site was surrounded by wetlands and poorly drained areas
- Found 7 singing male Canada Warblers, all in wet forest (Sphagnum moss)
- Wet Areas Mapping did not identify most of the area as wet
- Made similar BMP recommendations for Canada Warbler



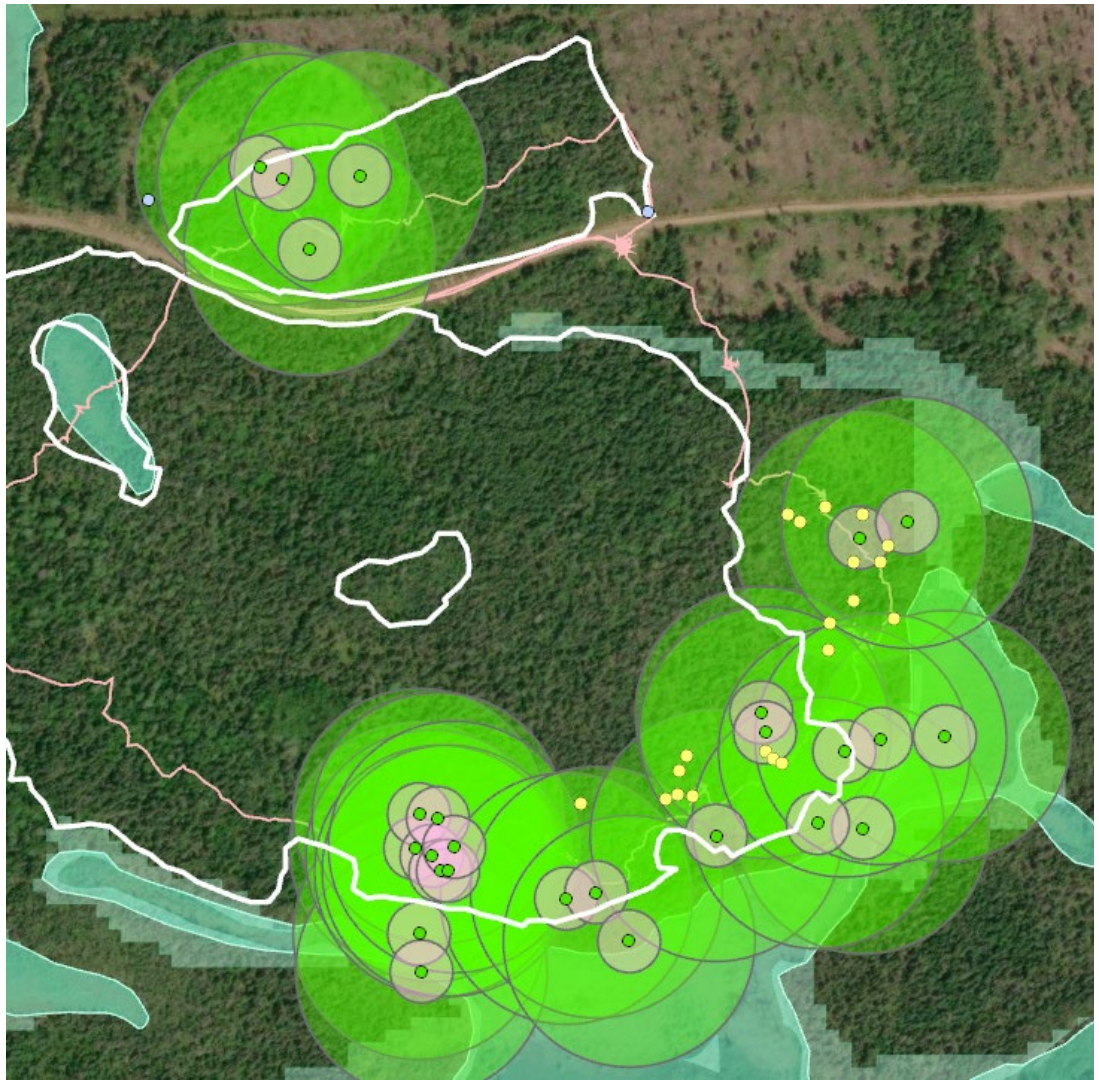
River Tillard West

- Near extensive wetlands.
- 3 Olive-sided Flycatcher territories on the block.
- 3 Canada Warbler territories on the block.
- Recommend BMPs for both SAR
- One or more pair of Common Nighthawks likely breeding in open areas adjacent to block.



Olive-sided Flycatcher BMP buffers

25-m no harvest buffers (small beige circles)



Within the Olive-sided Flycatcher BMP buffers (green; 25-100 m around bird locations):

- Use uneven-aged forest management systems when possible.
- Leave clumps of tall trees, esp. mature black spruce, standing in cutover areas.
  - Nest in mature spruce clumps. Hunt from the tops of tall trees.
- Leave all snags that are not a safety threat.
  - ➢ Taller snags are used as hunting perches.
- Avoid use of pesticides and herbicides.
  - ➢ Bees are a preferred food; they pollinate deciduous flowering shrubs; applying herbicides kills the shrubs, removing the bees' food source.

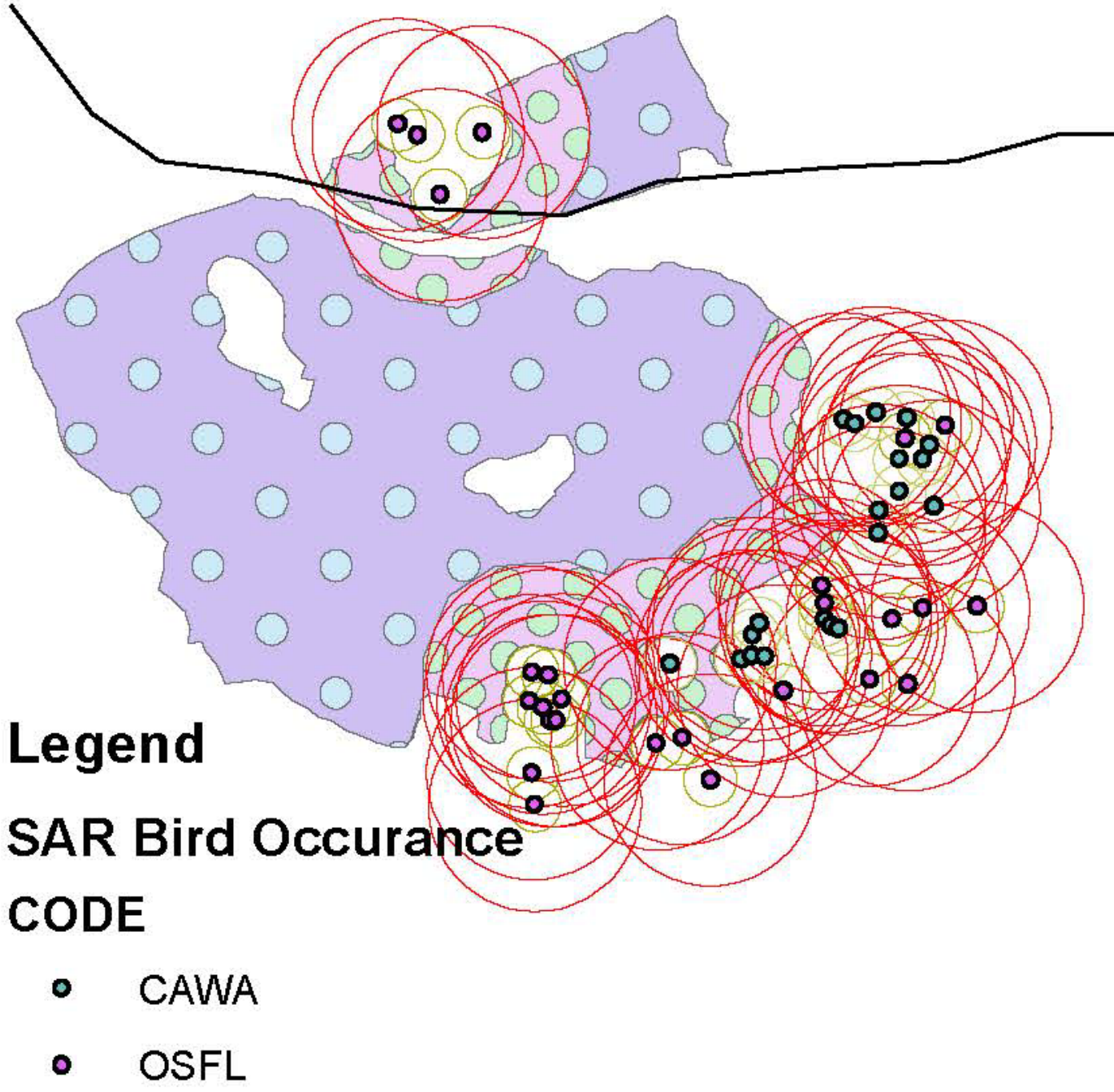
River Tillard West

Harvested with BMPs over the winter

Map courtesy of Nathan Rankin, PHP

Buffers and retention prescription

- SAR Bird Occurance - CAWA - 100m Buffer
- SAR Bird Occurance - CAWA - 25m Buffer
- SAR Bird Occurance - OSFL - 100m Buffer
- SAR Bird Occurance - OSFL - 25m Buffer
- RiverTillardWest_SAR-SMZ_30%RetentionClumps
- RiverTillardWest_NonSAR-SMZ_10%RetentionClumps
- RiverTillardWest_Harvested_NonSAR-SMZ
- RiverTillardWest_Harvested_SAR-SMZ



Common Nighthawk BMPs

- Retain large, dead and imminently declining trees as future source of large woody debris: ≥12 cavity trees/ha, half with a DBH of ≥25 cm
- Skid back onto block large cull pieces ≥25 cm DBH x ≥2 m long
- Create suitable nesting conditions by leaving areas of old/deactivated roads, turnarounds, other open areas undisturbed during the breeding season
- Avoid/limit pesticide/herbicide use
- In case of natural disturbance, leave ≥25% of the areas unsalvaged

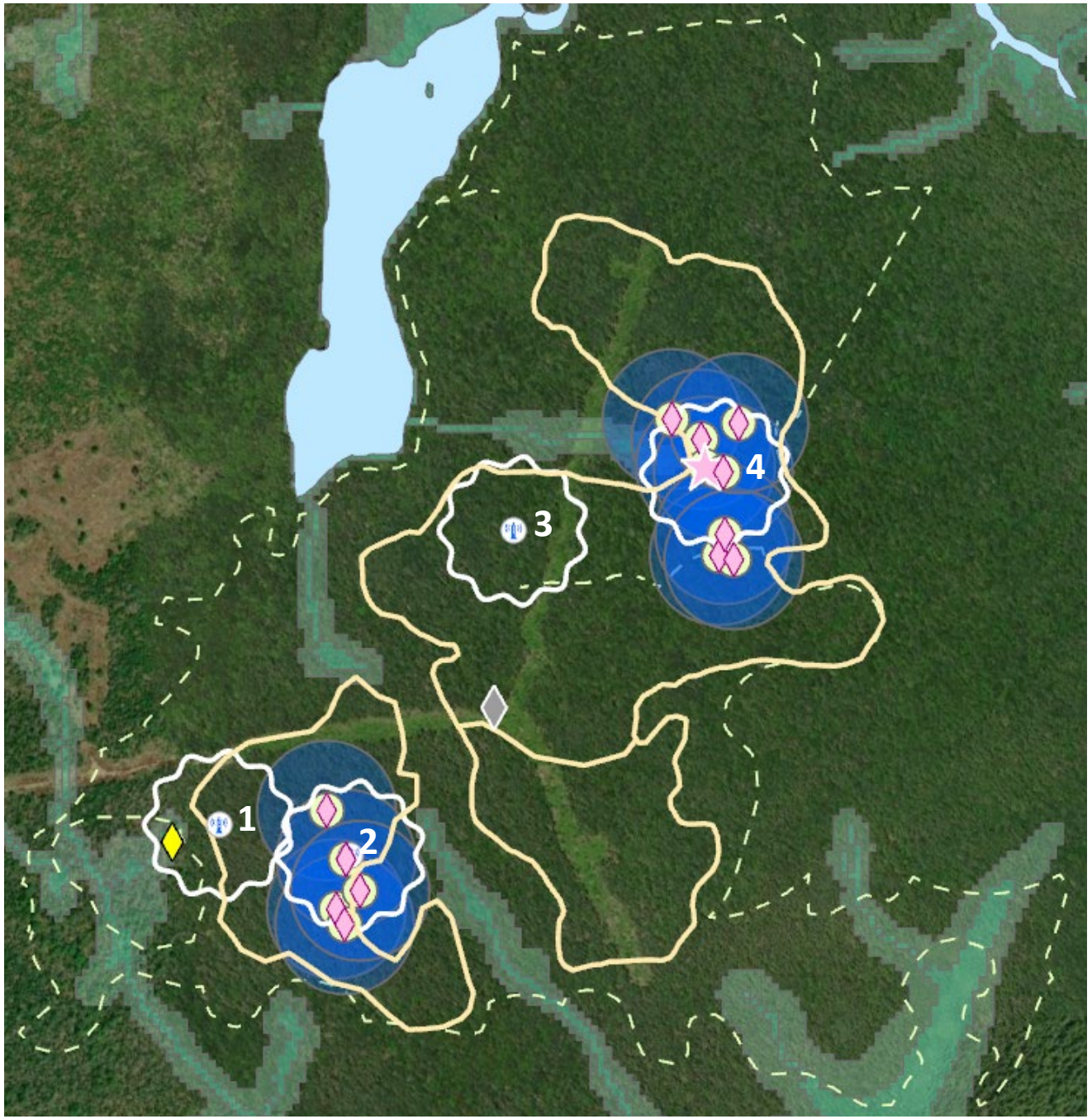
MCFC AP190003

2 pairs of Eastern Wood-Pewees, one with nest (pink star, near ARU 4)

4 ARUs deployed - all detected:

- Eastern Wood-Pewee
- Common Nighthawk
- Chimney Swift
- Evening Grosbeak

ARU 1 detected Canada Warbler in adjacent swamp



ARU with 100 m detection radius

Eastern Wood-Pewee with 25 m buffer

100 m buffer

Canada Warbler

Chimney Swift

Eastern Wood-Pewee BMPs

- In the 75 m buffer, the following silvicultural practices are recommended:
- Maintain large, mature trees:
  - >30 cm DBH in deciduous stands
  - >35 cm DBH in conifer/mixedwood stands
- Maintain a total basal area of 22 m/ha.
- Maintain gap dynamics of small scale, incremental disturbances to support development of uneven-aged stand structure.
- Research on NS forest retention and gap size recommendations

Stand with Eastern Wood-Pewee nest

Documenting BMP effectiveness

- Plan to resurvey the harvest blocks where BMPs were applied
    - Are the SAR birds documented the previous summer present? Are they using same area?
    - If so, evidence that the BMPs worked to retain habitat elements SAR needed
- Partners obtain post-harvest stand data
- Obtain drone images to document the habitat after harvesting
    - Analyse forest metrics, compare with data from drone images obtained before harvest

Also surveyed Contol sites (not being harvested during project) – e.g., Otter Ponds Demonstration Forest

Common Nighthawks

Strategies for incorporating BMPs into private woodlot management

- Apply BMPs for the SAR most likely to be present
- Learn to identify the preferred habitat of each SAR
- Use SAR records (AC CDC) and habitat models to identify areas more likely to have suitable habitat
- Apply 50 m buffer around wetlands, wet forest, streams, vernal pools
- Use uneven-age management techniques to increase diversity in the vertical and horizontal structure within stands

Prioritization and scheduling silvicultural work

"What if I can't stop harvesting for 2-3 months?"

Can still plan to do the least harm

- Prioritize sites, stands or areas for work *outside* of the nesting season:
  - Sites that have SAR or SAR habitat
  - Sites that support mature forest birds, most of which are declining
  - Sites with wet forest or adjacent to wetlands
    - Forested wetlands and more open wetlands are more productive sites, have more bird species, more individuals, more SAR than upland sites

Acknowledgements

Thanks to our partners in the BMP project:

- Medway Community Forest Co-op
- Port Hawkesbury Paper (PHP)
- WestFor
- CARP
- MTRI
- Biodiversity office, NS DNRR
- Terry Power, DNRR, Eastern Region

Thanks to my students and field assistants:

- Caleb Gibbons
- Kylie Santella
- Emilie McBeath
- Linda Hutchinson
- Joe Schell
- Tllie Shaver
- Alicia Kirkwood
- Ada Clarke
- Larissa Schinkel
- Stephanie Zuo

This project was undertaken with the financial support of:
Ce projet a été réalisé avec l'appui financier de :

Environment and Climate Change Canada
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Thanks to our funders:

- Federal: ECCC
- Provincial: NS DNRR
- Industry: PHP
- Dalhousie University

Dalhousie University – Inspiring Minds
Nova Scotia Habitat Conservation Fund – Contributions from Hunters and Trappers
Port Hawkesbury Paper
Medway Community Forest Cooperative
Mersey Tobeatic Research Institute
Clean Annapolis River Project – Enhancing the ecological health of the Annapolis River watershed through science, leadership, and community engagement
Nova Scotia Canada