Final Report: *Conservation Planning for Species at Risk and their Habitats in Nova Scotia.*

Habitat Conservation Fund Grant to Nature Conservancy of Canada, Atlantic Region

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PROJECT SUMMARY

NCC staff compiled, assessed, analyzed and mapped data and information relevant to identifying priority land for protection in three areas – the River Philip, and Wallace River in northern Nova Scotia and Lobster Bay in the southwestern part of the province. These areas are priority sites identified in NCC's Natural Areas Conservation Plans, and NCC has specific land securement goals for each area. To inform decision making, landowner contact and the effectiveness of our land securement work, NCC undertakes parcel-level assessments such as these, incorporating them into our Conservation Plans, the primary drivers of our conservation work.

Broadly, the results reveal a dearth of ecologically intact and unconverted land along both the River Philip and Wallace River. Biodiversity along these rivers has suffered from a long and ongoing settlement pattern that involved clearing of forests for agriculture and wood harvesting which is still very present upon the landscape today. In Lobster Bay, significant opportunity to protect important island and salt marsh habitats exist.

1. PROJECT GOALS and OBJECTIVES

The goal of this project was to contribute to NCC's efforts to protect important wildlife habitat, particularly habitat important to COSEWIC-listed species in three NCC 'focal areas'. The central objective was to complete a GIS-based spatial analysis of a variety of data to prioritize property for land securement. Supporting this would be the development of a database of owner contact information. In addition, NCC has engaged partner groups and individuals in the refinement of this work, strengthening partnerships and relationships in the process.

2. DESCRIPTION of WORK COMPLETED

We prioritized lands for securement in three NCC 'focal areas' identified through our Natural Areas Conservation Planning process. The methods for each are comparable but varied slightly to accommodate for regional considerations, and data quality and quantity issues.

In our analysis, we accepted as priority, without reservation, all properties included in the "A list" developed by the Science Advisory Committee of the Crown Share Land Legacy Trust and included them as 'Priority 1'. This is justified based on the focus of the 'A-list' on rare species values, as well as the knowledge and credibility of the people involved in creating it.

All results are summarized in map form later in this report.

Lobster Bay and Tusket Islands

Colonial Seabirds Occurrences
Using data provided by the Canadian Wildlife Service, islands with confirmed seabird colonies or species at risk occurrences (observation date 1990 or later) were immediately considered a 'Priority 1', unless they had been developed (see below). Islands with no confirmed colonies were still considered in the prioritization as recognition that the datasets used are incomplete, that islands are valuable habitat, and that birds and colonies move around over time. Islands without colonies were ranked based on size, larger islands receiving a higher score, smaller islands receiving a lower score. Scores were between '0' and '1'.

Ecological Condition
The ecological condition of each island in Lobster Bay was examined using the most recent imagery available through Google Earth. The vast majority of islands within the area have not been developed and do not contain any structures visible using this imagery. If structures indicating habitation were visible, then the parcel was eliminated from the analysis or downgraded to a 'Priority 3' if it contained a species at risk, which was, in practice, isolated to one historical occurrence of roseate tern in the Tusket Islands.

Prioritization Ranking
Priority 1 - High = Seabird colony present; no development.
Priority 2 – Medium = No seabird colony; no development; larger island.
Priority 3 – Low = No seabird colony; no development; smaller island.

Lobster Bay Salt Marshes

The objective here was to capture properties with a significant salt marsh component located within a large, contiguous salt marsh complex, and where occurring – ones that support rare species.

In order to identify the largest contiguous tracts of salt marsh, we examined Google Earth imagery, and polygons from the provincial wetland inventory were split or merged based upon our interpretation of on-the-ground features. For example, if a salt marsh appeared to be separated by anthropogenic structures (i.e. road), it was considered two separate salt marshes. Conversely, separate marsh polygons were merged if there appeared to be no anthropogenic feature separating them. The result was a much clearer indication of where the largest contiguous salt marshes are located.

The assumption made here is that larger salt marshes in this area provide more habitat, support greater species diversity and may have more interior habitat unaffected by surrounding human activity. These assumptions require ground-truthing, however, for this analysis properties found either wholly or partially within a larger marsh complex, were given a higher score, while properties found wholly or partially within a smaller marsh complex were given a lower score. The scale ranged from '0' (smaller marsh complex) to '1' (larger marsh complex).

Marsh - Other Habitat Ratio
Properties were coded categorically according to the ratio of salt marsh – 'other habitat' (other habitat generally refers to uplands containing forests) found within the parcel's boundaries. Properties with greater than approximately 2/3 (>65%) of their total area in salt marsh were ranked highest, while those with less than 1/3 (<34%) of their total area in salt marsh were ranked lowest. This will help NCC pursue acquisition of properties with a larger marsh component as opposed to larger components of upland buffer.

Rare Species Occurrences (COSEWIC listed/S1-S3)
Given the highly unique botanical elements found in Lobster Bay salt marshes, 6 rare species were included as targets in the analysis. The species included are listed below. A continuous weighting scale ranging from 0-1 was used. A score of '0' representing no occurrences of the species listed, '0.5' representing 3 occurrences, and a score of '1' representing a density of six rare species occurrences (highest density in the analysis). Due to concerns regarding precision, all records from before 1990 were eliminated.

Species included as targets:
Olney's Bulrush – *Schoenoplectus americanus* (S3)
Beaked Spikerush – *Eleocharis rostellata* (S3)
Saltmarsh agalinis - *Agalinis maritima* (S1S2)
Eastern baccharis – *Baccharis halmifolia* (S1; N-Threatened)
Triglochin gaspensis - *Gaspe arrowgrass* (S1)
Big-leaved marsh elder - *Ira frutescens ssp. oraria* (S2)

Prioritization Ranking
Scores from the individual analyses of the three targets were rolled up to provide one measure of priority. Each target was given equal weighting, and scores were summed. We then used the GIS to identify the 'natural breaks' in the scores, separating them into 'Priority - High1, 'Priority 2 - Medium' and 'Priority 3' - Low.

Note: at the advice of Sean Blaney, botanist with the Atlantic Canada Conservation Data Centre, several parcels at the north end of Morris Island were added based on his local knowledge of the region and indication that these marshes host rare species occurrences. Upon investigation, it seems that the point records in the CDC data layer for these properties were mapped outside of the property boundary and associated 30 metre buffer we allowed, resulting in their initial exclusion.

River Philip and Wallace River

The River Phillip and Wallace River were targeted in the Nova Scotia Northumberland Strait Natural Area Conservation Plan for the presence of rare or uncommon tree species associated with floodplain forest communities. Due to the highly fragmented landscape along the rivers edge in this region, a more manual, interpretation-based approach was taken to prioritizing properties along these two waterways. Conservation targets considered were the presence/absence of intact floodplain or riparian forest and the presence absence/abundance of rare species occurrences.

Intact Floodplain/Riparian Forest

To establish the location of floodplain, we established a range of 0 - 15 metres above the level of each river as mapped in a digital elevation model. While admittedly not perfect, this method , we believe, gives us a workable understanding of areas likely to flood during seasonally high water or major storm events. Using black and white orthophotos (1:2000 scale), the condition of the forest habitat within each property along the two rivers (and within the NCC area of focus) was reviewed. Any properties severely altered by forest harvesting, agriculture or development were not a priority. Properties deemed to be priority were those displaying intact forest cover with an apparent typical diverse Acadian species composition. Forest inventory data was consulted to gain indication of species composition; however, this data was regarded with a high level of skepticism, and was only useful in some instances, due to broad coding schemes (i.e. tolerant hardwoods) and known high rate of error. Stand height was used as a rough surrogate for a later stage of structural development. Stands greater than 15 metres, with a potentially desirable species composition were included.

All properties selected for forest value alone were regarded as Priority 2.

Field verification will be required on properties with apparently intact floodplain forest to investigate for the target communities containing species such as black cherry (*Prunus serotina*), American elm (*Ulmus americana*), black ash (*Fraxinus nigra*) and silver maple (*Acer saccharinum*).

Properties less than 10 acres in size were examined and only included if they held significant biodiversity value or if they had potential to contribute to a larger assembly of high priority properties.

Rare Species Occurrences (COSEWIC listed/S1-S2)

The element occurrence records of all S1-S2 species as well as any federally listed species at risk were considered. Only data from 1990 and forward was used. Each element occurrence was buffered 30 metres to encompass properties that were in close proximity to the species location. Properties containing intact forest habitat and buffering occurrences of federally listed species and S1-S2 ranked species were considered Priority 1 – High.

Properties containing an S1-S2 or federally listed species occurrence, but with highly degraded habitat, or without intact riparian or floodplain forest habitat, were not considered priorities.

Prioritization Ranking

Priority 1- High = Intact floodplain/riparian forest*; federally listed species at risk occurrence (30 m buffer applies).
Priority 2 – Medium = Intact floodplain/riparian forest*
** subject to ground-truthing*

3. RESULTS

Results of analyses for all three areas are summarized in map form below.

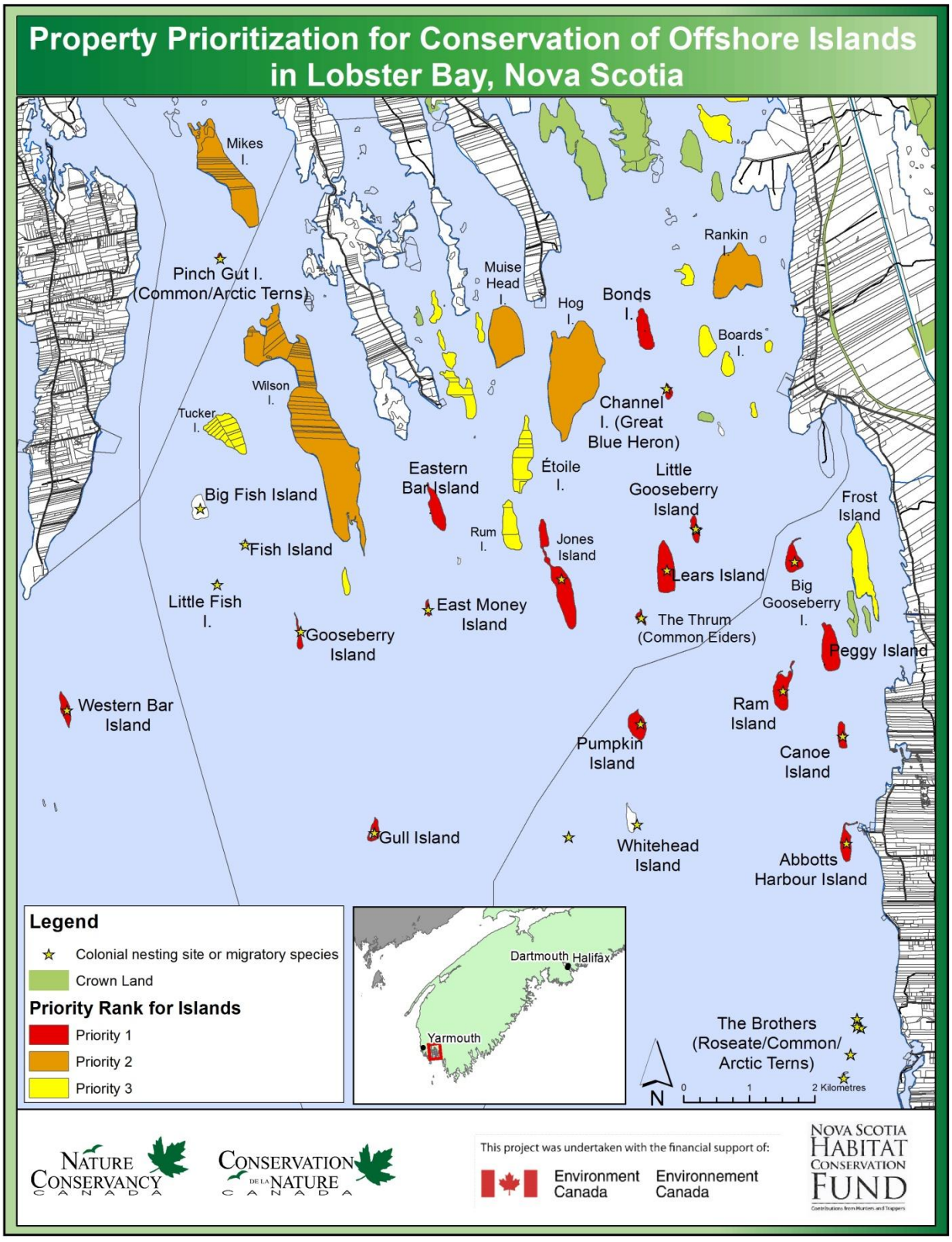

Figure 1a. Mapped results of prioritization of coastal islands for securement in Lobster Bay.

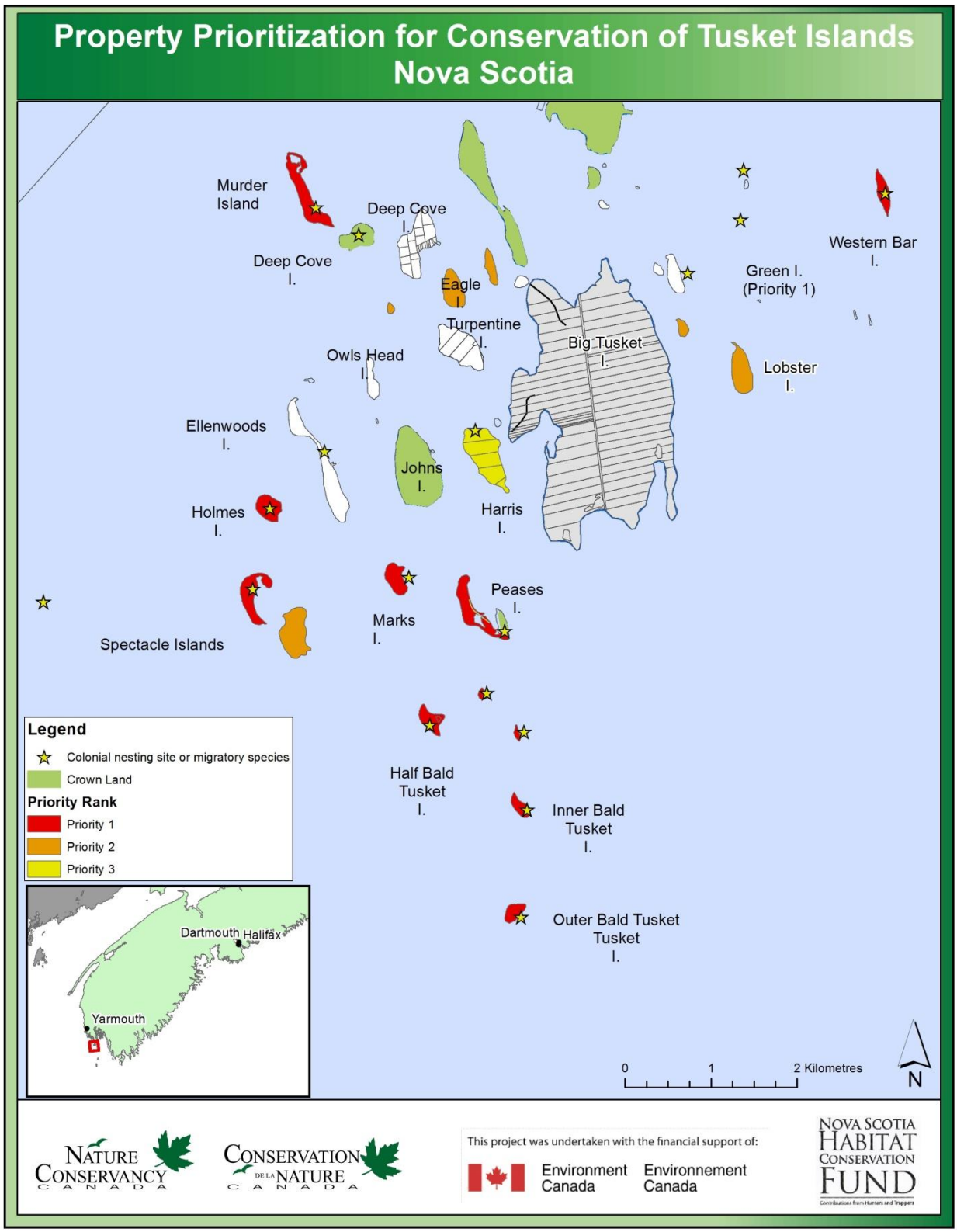

Figure 1b. Mapped results of prioritization of coastal islands for securement in Lobster Bay – Tusket island portion.

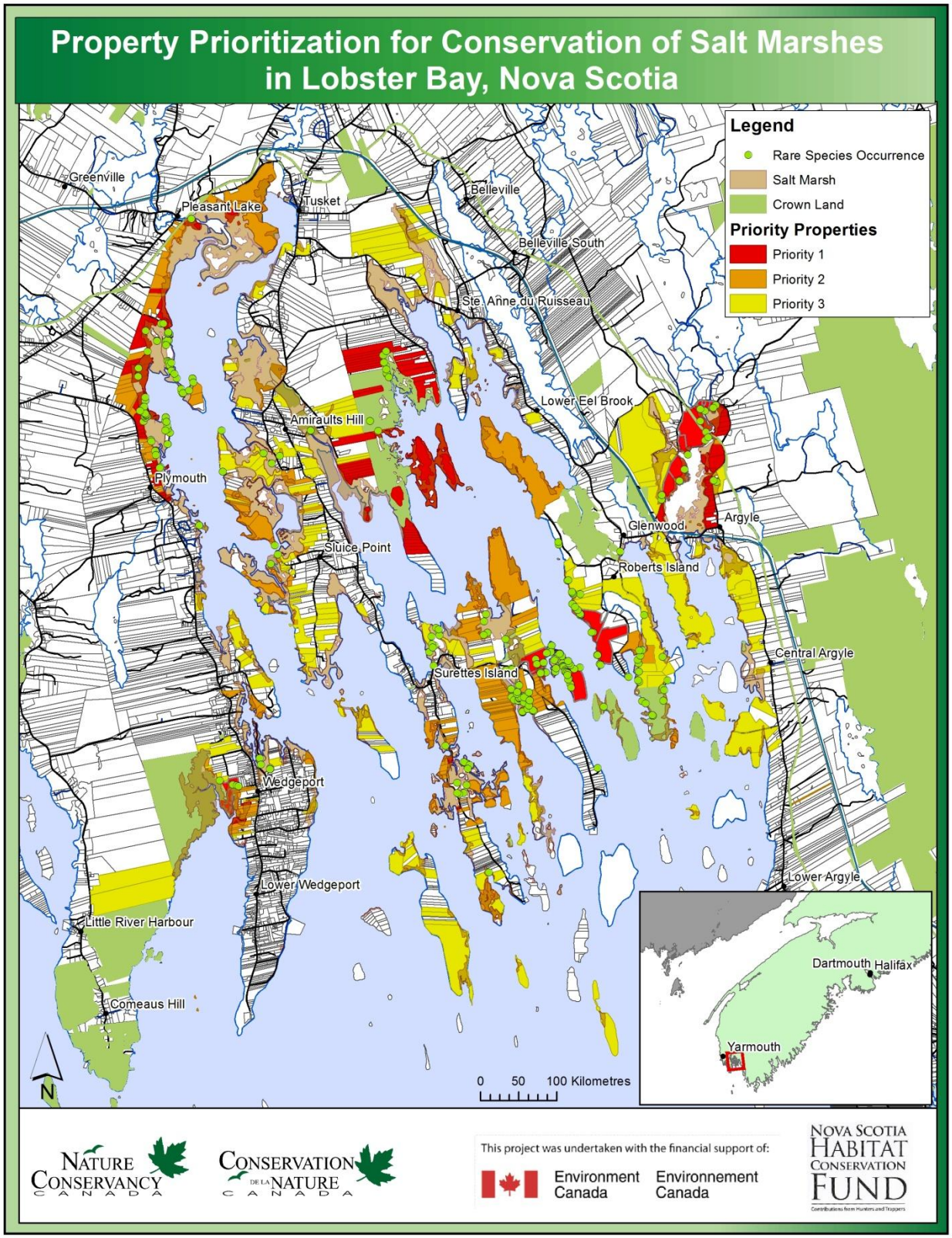

Figure 2. Mapped results of prioritization of salt marsh for securement in Lobster Bay.

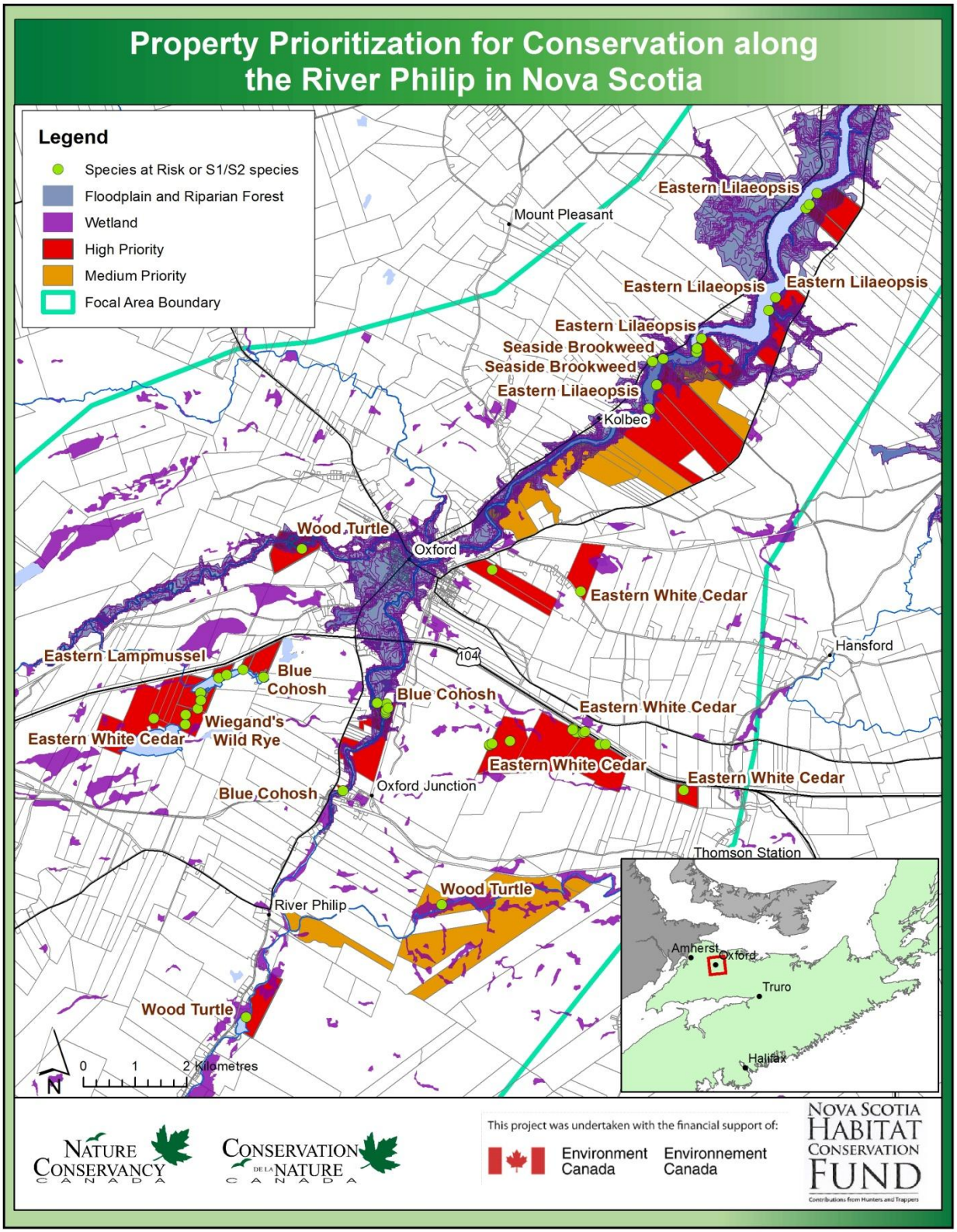

Figure 3a. Mapped results of prioritization of riparian properties containing floodplain forest and rare species occurrences in River Philip and associated tributaries.

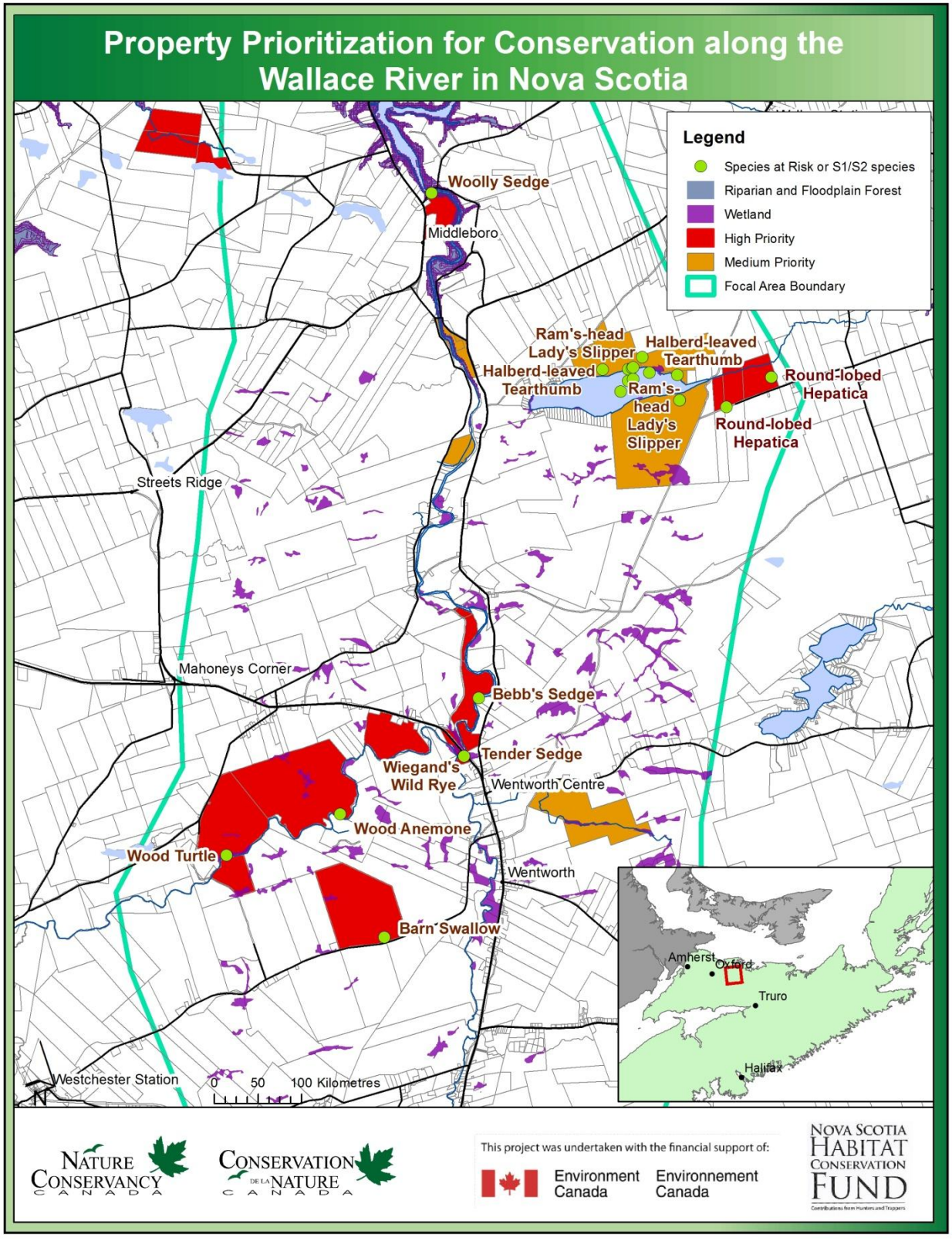

Figure 3b. Mapped results of prioritization of riparian properties containing floodplain forest and rare species occurrences in Wallace River and associated tributaries/nearby waterbodies.

4. ACHIEVEMENTS, LESSONS LEARNED, RECOGNITION

This work is a portion of the greater effort to protect important wildlife habitat and known occurrences of species at risk in the River Philip, Wallace River and Lobster Bay areas. As a critical step to guiding NCC's land securement work, this project has been a great success. NCC now has a clear, defensible and scientifically sound basis for justifying pursuit and acquisition of certain land parcels in the three focal area. As a charitable organization with a responsibility to use funds wisely, NCC takes this type of work very seriously.

As expected, the data available to undertake the exercise was not as complete as it could potentially be to maximize the accuracy of the prioritization. This was understood prior to undertaking the analysis however, so no major surprises were encountered. The datasets maintained by Nova Scotia Department of Natural Resources – Wetlands Inventory and Forest inventory, were of tremendous utility, as were the provincial black and white 1:2,000 series orthophotos.

5. Next Steps

This work will require ground truthing. NCC staff plan to spend several days conducting field work in each focal area to test the results of the analysis. This may result in further refinement.

Following ground truthing, NCC will move towards the initiation of land securement efforts, working towards the goals as outlined in our conservation plans for each area.

RECOGNITION

The Habitat Conservation Fund will be recognized for their contributions to NCC's work in several ways. All maps to be shared with partners contain (as above) the logo of the Habitat Conservation Fund. In addition, the Department has been listed as a partner on NCC's website, and will be listed in our 2011-12 annual report due in fall 2012 as well as our annual donor recognition within the Ark, NCC's national newsletter. In addition, NCC will offer the Department an opportunity to develop materials for a story highlighting the Fund's ongoing support for NCC projects to be placed on the NCC's website.

The following people assisted in the review of this work. We are grateful for their contribution.

Karel Allard, Andrew Boyne – Canadian Wildlife Service
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