Aoyama, Haruka

From: Mancini, Tony
Sent: Monday, November 22, 2021 4:47 PM
To: Aoyama, Haruka
Subject: FW: Next ESSC meeting - presentation request
Attachments: Wildlife Corridor Charrette_Halifax_SummaryReport_Mar2021_Final_NSCSLLT.pdf

---

From: Karen McKendry
Sent: Monday, November 22, 2021 2:33 PM
To: Mancini, Tony <mancint@halifax.ca>; Morse, Kathryn <morsek@halifax.ca>
Subject: [External Email] Next ESSC meeting - presentation request

[This email has been received from an external person or system]

Hello Councillors Mancini and Morse. I would like to make a presentation at the December ESSC meeting. I'd like to share information with the committee about the Wildlife Corridor Landscape Design Charette Report (attached). This report was produced 1 year ago by many conservation partners and community groups, with 2 HRM staff as observers to the process. The results have yet to be incorporated by HRM in any way, which is something that could be discussed by the committee.

I've requested before to present to the committee on this topic but I think the response was that the Report applied mostly to certain districts, and that presenting to North West Community Council was a better fit. I still think that a presentation to the ESSC is a better fit, for the following reasons:

- It can be quite helpful to have the Report presented to a group of interested and informed people. In a presentation I can delve into certain maps and answer questions, drawing connections to relevant HRM policies and plans. This can be more efficient and insightful for councillors than just reading the Report.

- Councillors on the ESSC are familiar with other environment-related issues and plans that the Report could integrate with, including the Halifax Green Network Plan, and current efforts to consider biodiversity and wetlands in city planning and city work. The ESSC is the perfect audience to examine how the report connects with other HRM work.

- The Report, like the Halifax Green Network Plan, has implication for all of HRM, not just western districts.

- **The Report has important insights that could be used in planning large housing developments**, such as those that may be approved by the provincial task force on housing. From discussion at the

November ESSC meeting it sounds like the provincial Minister of EEC (Tim Halman) will be at your December ESSC meeting. *I would very much like to present in the same meeting that the Minister will be a part of.* It could be helpful to get the Report and presentation about it in his mind as the idea of the housing task force gets fleshed out.

I'm ready, willing, and able to present at the December meeting, and would share the report in a way that makes it relevant to all those present in the meeting, and for HRM staff working on related issues.

Karen :)

Karen McKendry (she/her), Wilderness Outreach Coordinator
Ecology Action Centre
Kjipuktuk, Unceded Mi'kmaw Territory

2705 Fern Lane, Halifax, NS, B3K 4L3
ecologyaction.ca

Become an **EAC Member** | Follow us on **Facebook**, **Twitter** & **Instagram**

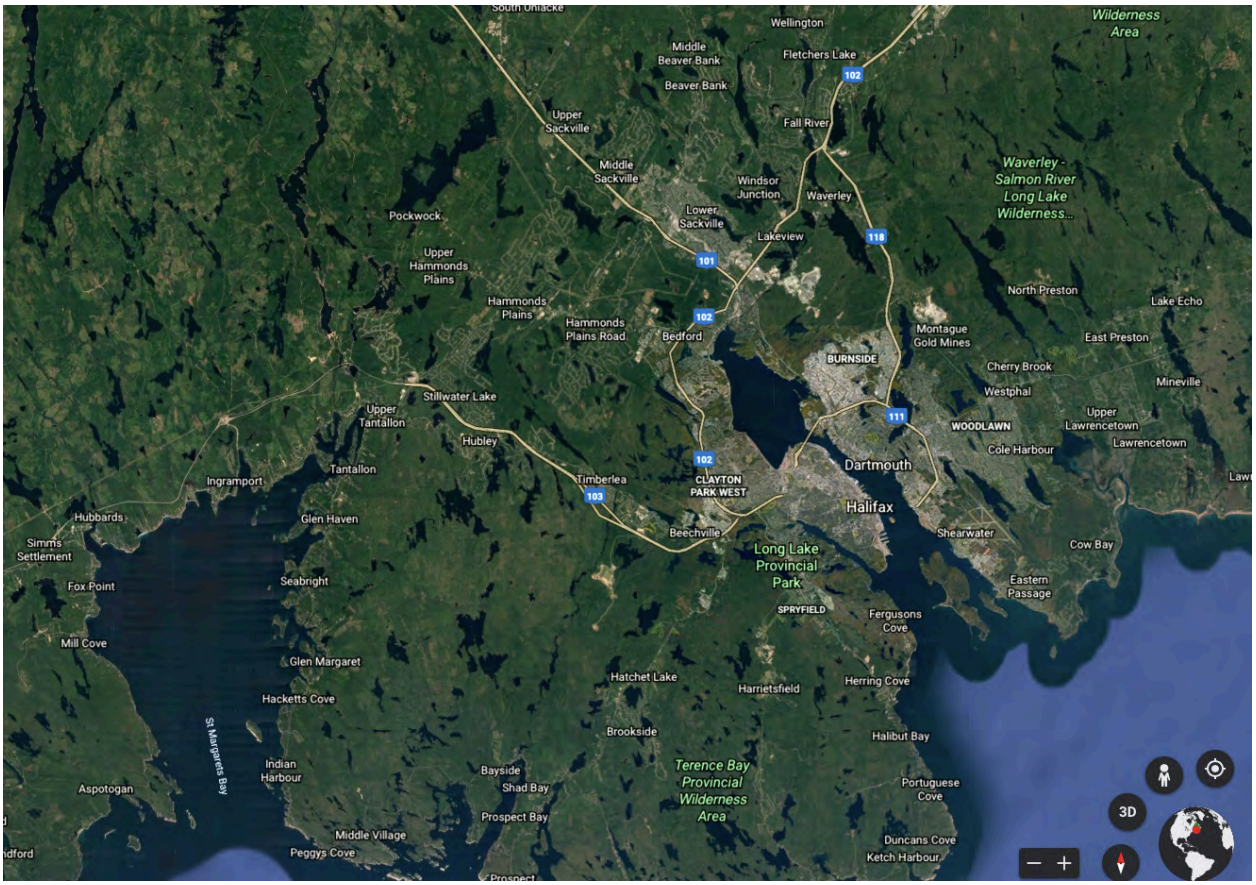
WILDLIFE CORRIDOR LANDSCAPE DESIGN CHARRETTE

Chebucto-Timberlea-Sandy Lake area of Halifax, NS

Summary Document

NOVA SCOTIA CROWN SHARE LAND LEGACY TRUST

Halifax, NS, March 2021



Source: Google Earth

Cite report as:

Nova Scotia Crown Share Land Legacy Trust. 2021. Wildlife Corridor Landscape Design Charrette: Chebucto-Timberlea-Sandy Lake area of Halifax, NS. Summary Document. Nova Scotia Crown Share Land Legacy Trust, Halifax, NS. Canada. 55pgs.

Cover photo: Five Bridge Lakes, K. Beazley

Halifax is located in Mi'kma'ki, the ancestral and unceded territory of the Mi'kmaq.

We are all Treaty people.

INTRODUCTION AND CONTEXT

Halifax Regional Municipality's initial regional plan (2006) and the regional plan update (2014) highlight the importance of ecological connectivity between natural areas so as to enable and facilitate the movement of species across intervening landscapes that are becoming increasingly occupied by a continuously expanding pattern of urban development. The 2006 and 2014 plans (Map 4, in each case) identify connectivity priorities at a macro scale; however, although useful in identifying the importance of planning for the protection and maintenance of ecological corridors, both plans lack detail in regard to providing explicit direction for on-the-ground implementation.

The 2014 plan therefore calls for the preparation of "a greenbelting and open space priorities plan to protect and preserve connectivity between natural areas and open space lands …". The resulting Green Network Plan (2018) provides direction for land management and community design "to maintain ecologically and culturally important land and aquatic systems" and "to identify, define and plan land suited for parks [and protected areas] and corridors". A particular focus of the Green Network Plan (Map 9) is emphasis on the preservation and creation of natural connections between the Chebucto Peninsula and the greater Mainland.

As the Green Network Plan remained largely a 'desktop' effort based on available GIS information, the charrette approach reported on herein attempted to move the process a step forward, by bringing GIS experts together with other participants having scientific and local area knowledge, to map significant corridor opportunities and options relative to the Chebucto Peninsula and existing and proposed protected areas on the Peninsula and nearby greater Mainland, generally extending from Ingrams River to the Peninsula to the Sandy Lake area.

OVERVIEW

Ecological connectivity is "the degree to which the landscape facilitates or impedes movement among resource patches" (Taylor et al., 1993, p. 571). It has both structural (based on the spatial structure of the landscape) and functional (based on how a particular organism reacts to the spatial structure of the landscape) elements, but the two are not mutually exclusive, with each informing the other (Brooks, 2003). At the landscape level, connectivity is often modelled through a core-corridor model, where large, vegetated areas serve as the core areas which are connected to one another by corridors.

Corridors are linear connections that facilitate through-movement across the landscape between core areas. Some corridors are contiguous, providing continuous physical connection between core habitat areas, while other are stepping stones, a linear series of smaller pieces of habitat linking two core habitat areas. Ideally, corridors should be as wide as possible to mitigate the edge effects that result from development on either side of a corridor and extend into the corridor, creating the zone of influence of human activity. For example, the zone of influence for black bears is 5 km in residential areas (Ford et al., 2020). To account for this zone of influence and to have a 1 km wide effective corridor for black bear, the corridor needs to be at least 6 km wide.

In Halifax Regional Municipality (HRM), the Halifax Green Network Plan was approved by Council in 2018. The Plan includes a framework to define an interconnected open space system, describes the benefits of such a system, and recommends actions to implement the Plan. To map the current state of connectivity of natural areas in HRM, the Plan used a core-corridor model, identifying 'Important Corridors' (the loss of which would impact local connectivity, but likely not regional

connectivity) and 'Essential Corridors' (those that provide critical or unique connections between core areas and are crucial to regional connectivity). According to the Plan, Essential Corridors should be at least 1 km wide (though the width should increase in proportion to the corridor's length), and Important Corridors should be at least 100 m wide. Where these widths are not possible, the Plan calls for as wide of an area to be maintained as possible and for restoration activities to be undertaken to restore disturbed habitats and to mitigate the impacts of nearby human activity(Halifax Regional Municipality & O2 Planning and Design, 2018, p. 36).

While the Halifax Green Network Plan provides a good basis for regional level planning, there are opportunities to build on the Plan's modeling and identify critical areas for connectivity at a finer scale, especially within and around the city's urban core, where there is pressure from urban development, road construction and forestry. Ultimately, more refined corridor mapping and rationale is needed to inform Action 32 in the Plan: "Amend the Regional Plan and Municipal Planning Strategies to prioritize the preservation and creation of natural connections to the Chebucto Peninsula (Map 9) from the Mainland when reviewing development proposals and updating planning policies and zoning in the area."

THE CHARRETTE PROCESS

On November 25, 2020, the Nova Scotia Crown Share Land Legacy Trust (NSCSLLT) hosted a virtual charrette to bring together scientists, planning experts and community advocate groups (for a full list of participants see Appendix I) with specific local area knowledge to create a conceptual map for wildlife corridors extending from the Backlands to the Ingram River Wilderness Area and the Sandy Lake-Sackville River Area. These are the main areas that provide habitat connectivity for wildlife on the Mainland moving to and from the Chebucto Peninsula.

Participants were divided into four groups, each looking at connections between different core areas (Figure 1):

a) Sackville River- Sandy Lake to Blue Mountain Birch Cove Lakes Wilderness Area (BMBCL);
b) BMBCL to the proposed Ingram River Wilderness Area;
c) BMBCL to the Five Bridge Lakes Wilderness Area; and,
d) Five Bridge Lakes Wilderness Area to Long Lake Provincial Park and the Backlands.

Each group worked together to identify the critical connections in their core area, considering both terrestrial and aquatic connectivity, as well as both structural and functional elements of connectivity. The goal of this charette was to create a series of maps (and their supporting rationale) that would build on the Plan's corridors mapping and would also identify areas not currently being considered in connectivity planning which should be considered.

The objectives were to: 1) stimulate thinking about possible solutions and collaboration amongst knowledgeable individuals; 2) create a series of conceptual maps that could be used for future refinements and work in the area; 3) identify areas not currently being considered in connectivity planning, but that should be considered in the future; and, 4) advance the work of O2 in the HGNP in identifying potential wildlife corridors by utilizing the extensive local knowledge of participants.

Each group presented their mapped outputs to the larger group. The maps were then compiled and refined for consistent symbology for presentation in this summary report. The four separate maps were overlaid and combined to form a composite map of the larger region. The following sections provide overviews of each of the four group maps, as well as a summary and composite map.

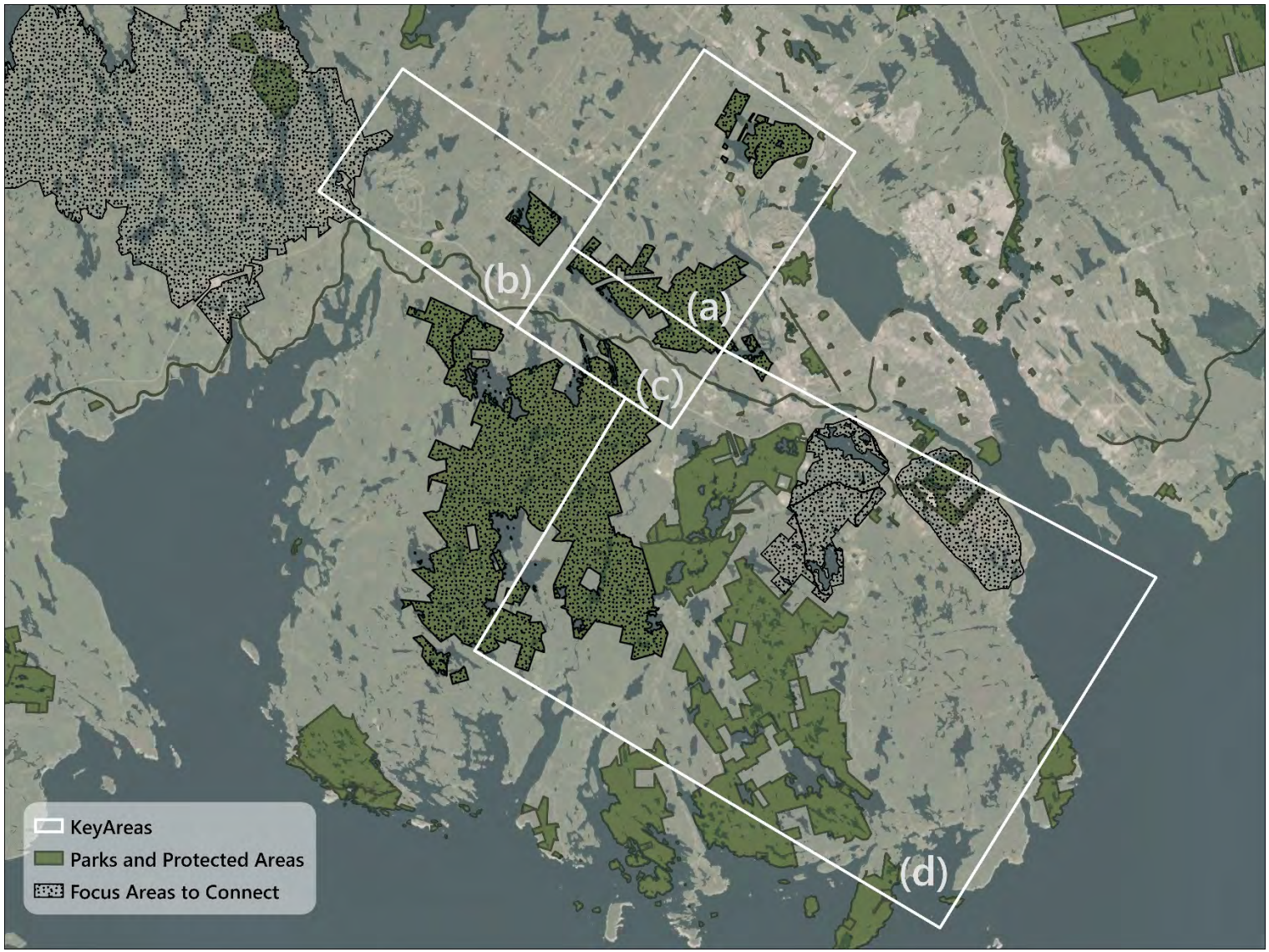


Figure 1. Key areas of concern for four groups during the charrette: Sackville River and Sandy Lake to Blue Mountain Birch Cove Lakes Wilderness Area (BMBCL) (a); BMBCL to the proposed Ingram River Wilderness Area (b); BMBCL to the Five Bridge Lakes Wilderness Area (c); Five Bridge Lakes Wilderness Area to Long Lake Provincial Park and the Backlands (d).

1. SACKVILLE RIVER-SANDY LAKE TO BLUE MOUNTAIN BIRCH COVE LAKES

Overview of the Area

The first group was focused on connectivity from the Sackville River and Sandy Lake to Blue Mountain - Birch Cove Lakes Wilderness Area (BMBCL). The Halifax Green Network Plan designates the Sackville River Valley from McCabe Lake to the Bedford Rifle Range as an essential corridor, and there are two converging important corridors linking Sandy Lake Regional Park and BMBCL, looping around the Stonington Park subdivision (Figure 2).

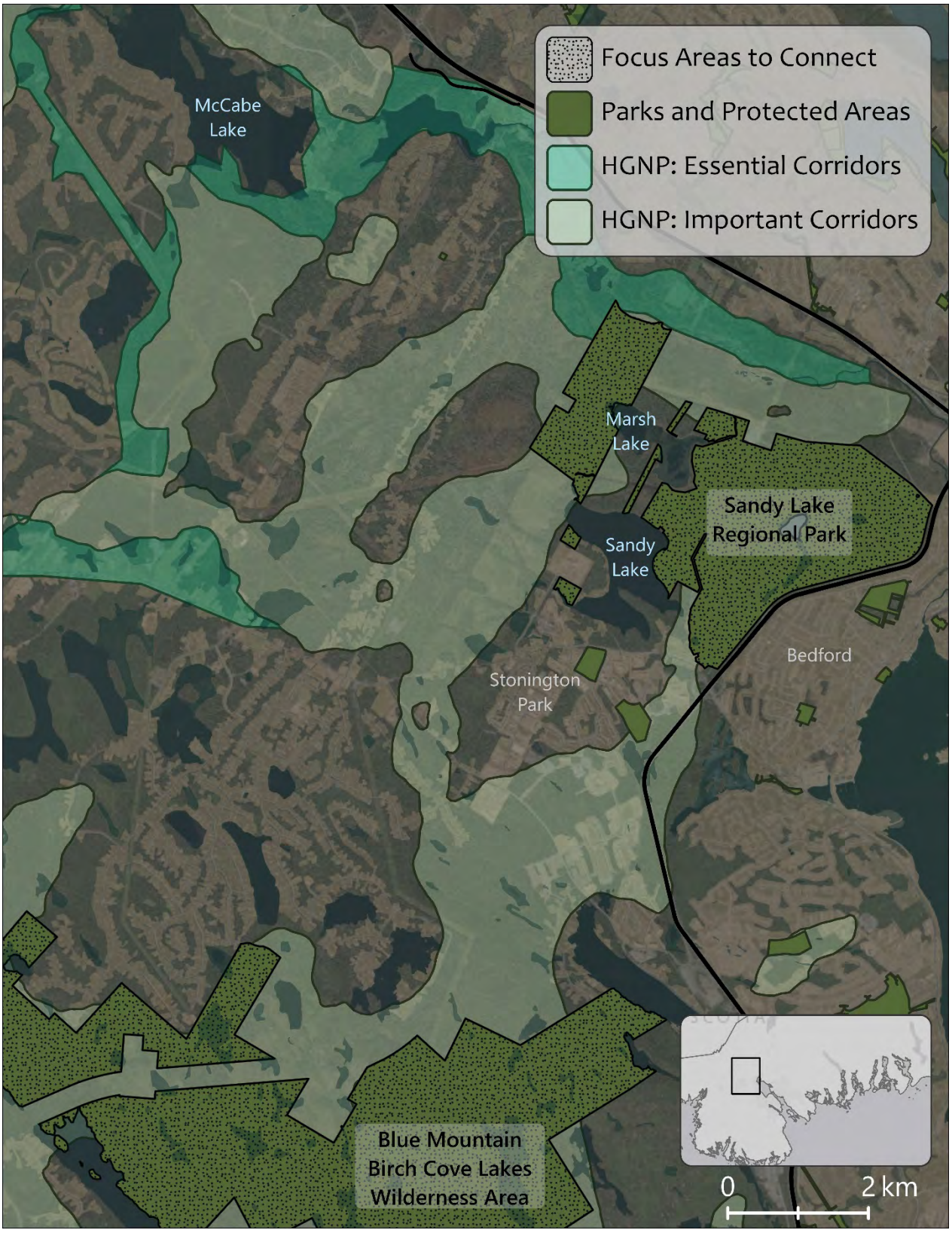


Figure 2. Overview of the area between Sandy Lake and Blue Mountain Birch Cove Lakes Wilderness Area

Primary Connections

The group identified a primary corridor that runs from Webber Lake along the Sackville River Valley into Sandy Lake Regional Park, through an essential corridor identified in the Halifax Green Network Plan (Figure 3). Between the two larger protected parts of Sandy Lake Regional Park lies Marsh Lake, which the group identified as being critical habitat to protect and an important area for aquatic connectivity. The important corridors identified in the Halifax Green Network Plan actually go around much of this critical area rather than incorporating it.

Another primary connection identified by this group runs along the west side of Sandy Lake to the intersection of Hammonds Plains Road and Larry Uteck Boulevard, which was identified as a major pinchpoint for connectivity between Sandy Lake and BMBCL (Figure 4). At this juncture, there are a few options for connectivity, which could also point to potential candidate spots for wildlife crossing structures. It was noted that there are a number of wetlands around this intersection which are important habitat and should form the basis of the corridors in the area.

The group largely focused their identification of corridors on aiming to preserve the areas around streams in order to maintain both aquatic and terrestrial connectivity, incorporating known corridors of wildlife movement to refine corridor placement. A corridor along a powerline right of way was also identified through the Uplands Park subdivision, which is known to be used by wildlife currently. From the Black Duck Wetlands there is a relatively undeveloped path that connects to BMBCL (Figure 5).

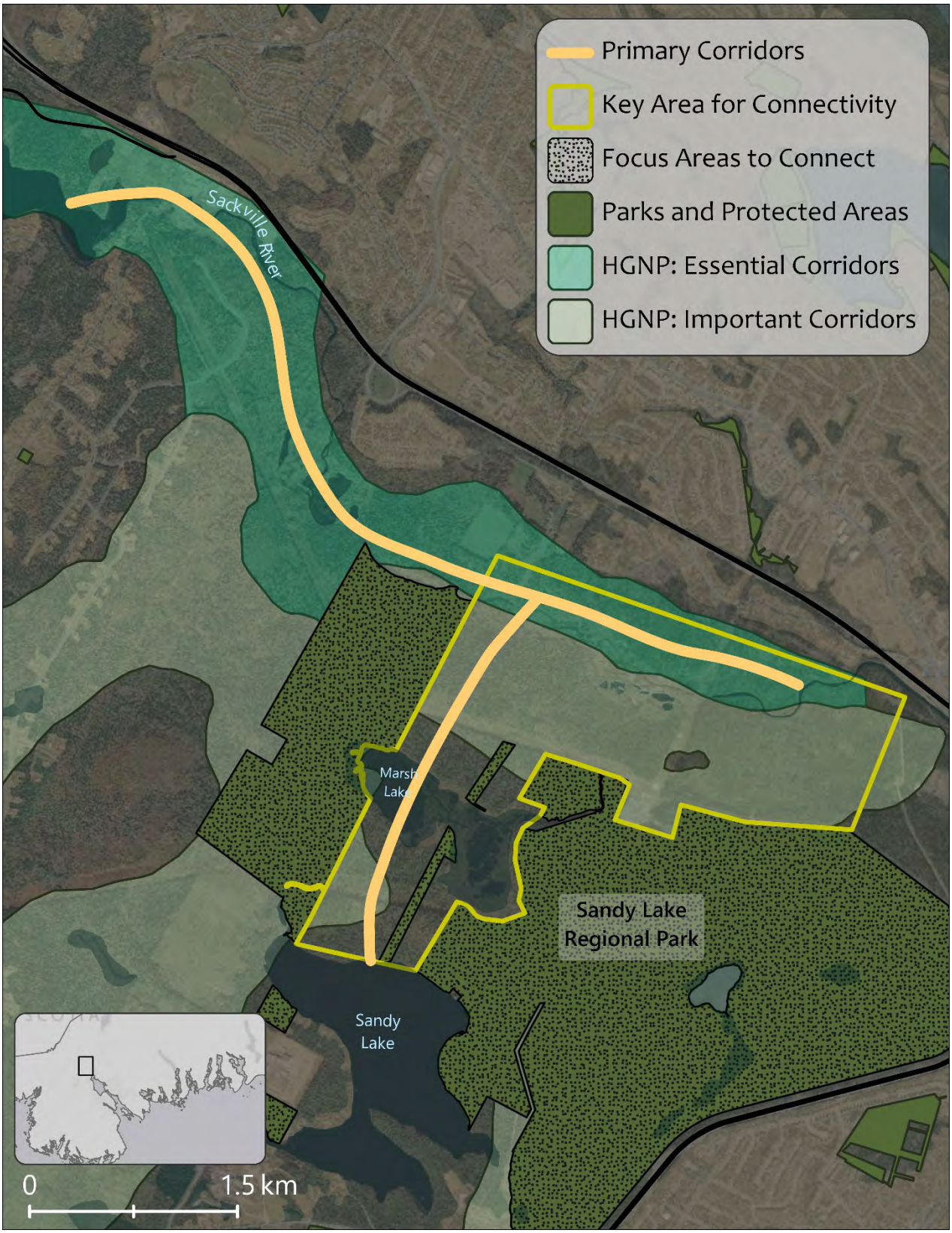


Figure 3. Connectivity between the Sackville River Valley and Sandy Lake, focused on the key area around Marsh Lake

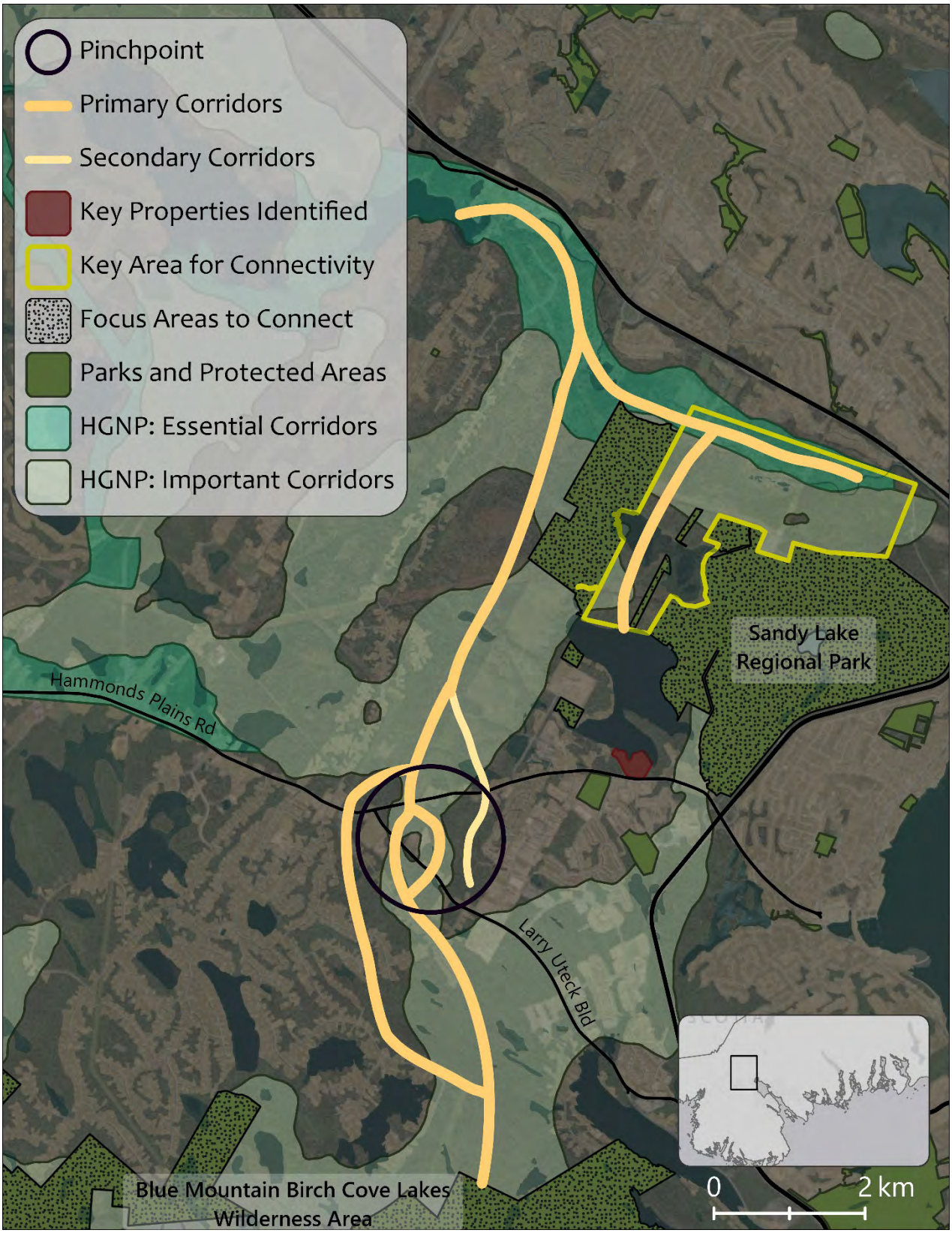


Figure 4. The main terrestrial connections between Sandy Lake and Blue Mountain Birch Cove Lakes Wilderness Area

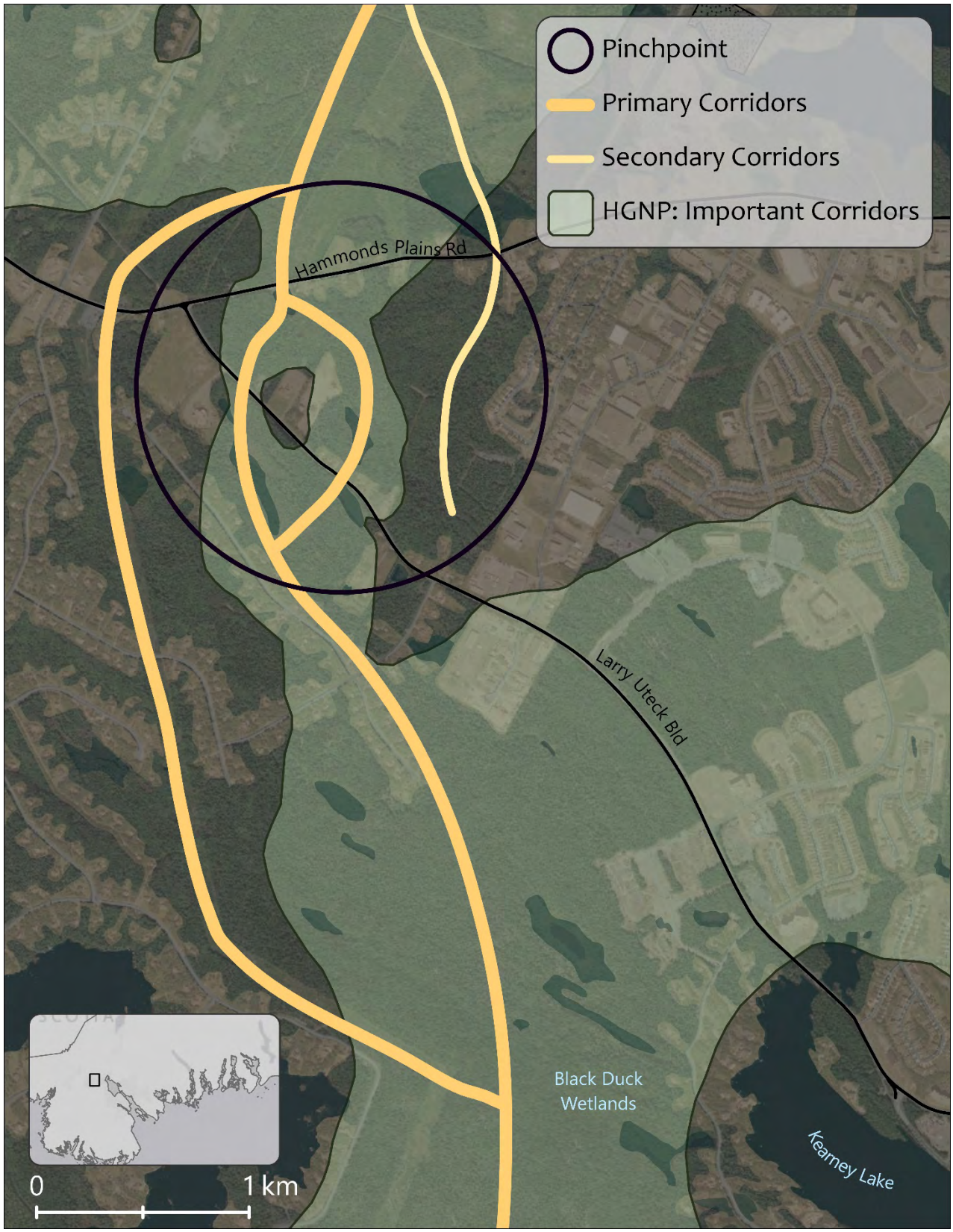


Figure 5. Pinchpoint around the intersection of Hammonds Plains Road and Larry Uteck Boulevard

Aquatic Connectivity

The entire Sackville River Valley was identified as being critical to protect, from McCabe Lake to the Bedford Basin, most of which is also designated as an essential corridor in the Halifax Green Network Plan (Figure 6). The group also noted that there is a pinchpoint for aquatic connectivity where the river meets Lucasville road, near Webber Lake (Figure 7).

As was noted above, Marsh Lake is an important area for connectivity, providing a direct linkage between the Sackville River and Sandy Lake via. Peverills Brook. Other streams and their tributaries flow from the BMBCL Wilderness Area into Sandy Lake, flowing around the intersection of Hammonds Plains Road and Larry Uteck Boulevard. As was noted above, this is a critical area for connectivity, and the group first identified the aquatic connections and then widened them to incorporate terrestrial connectivity as well. Several wetlands and streams connecting them were identified, including Black Duck Brook, which eventually flows into Kearney Lake and links up with an aquatic connection also identified by the group focused on connectivity between BMBCL and Five Bridge Lakes Wilderness Area.

Across the study area, the corridors identified by the group largely followed those in the Halifax Green Network Plan, but there were some differences, as noted (Figure 8).

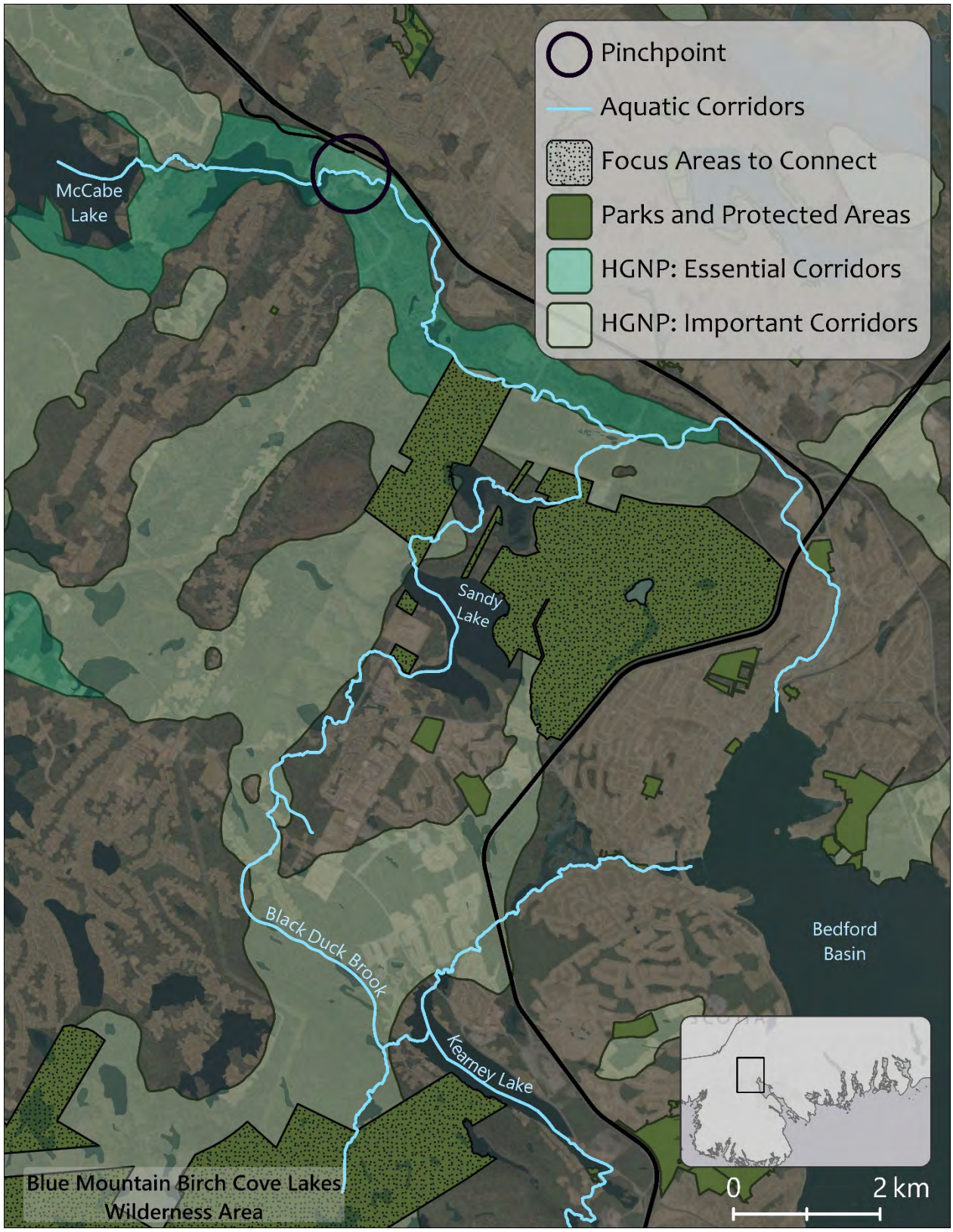


Figure 6. Aquatic Connectivity in the area around the Sackville River and Sandy Lake to Blue Mountain Birch Cove Lakes

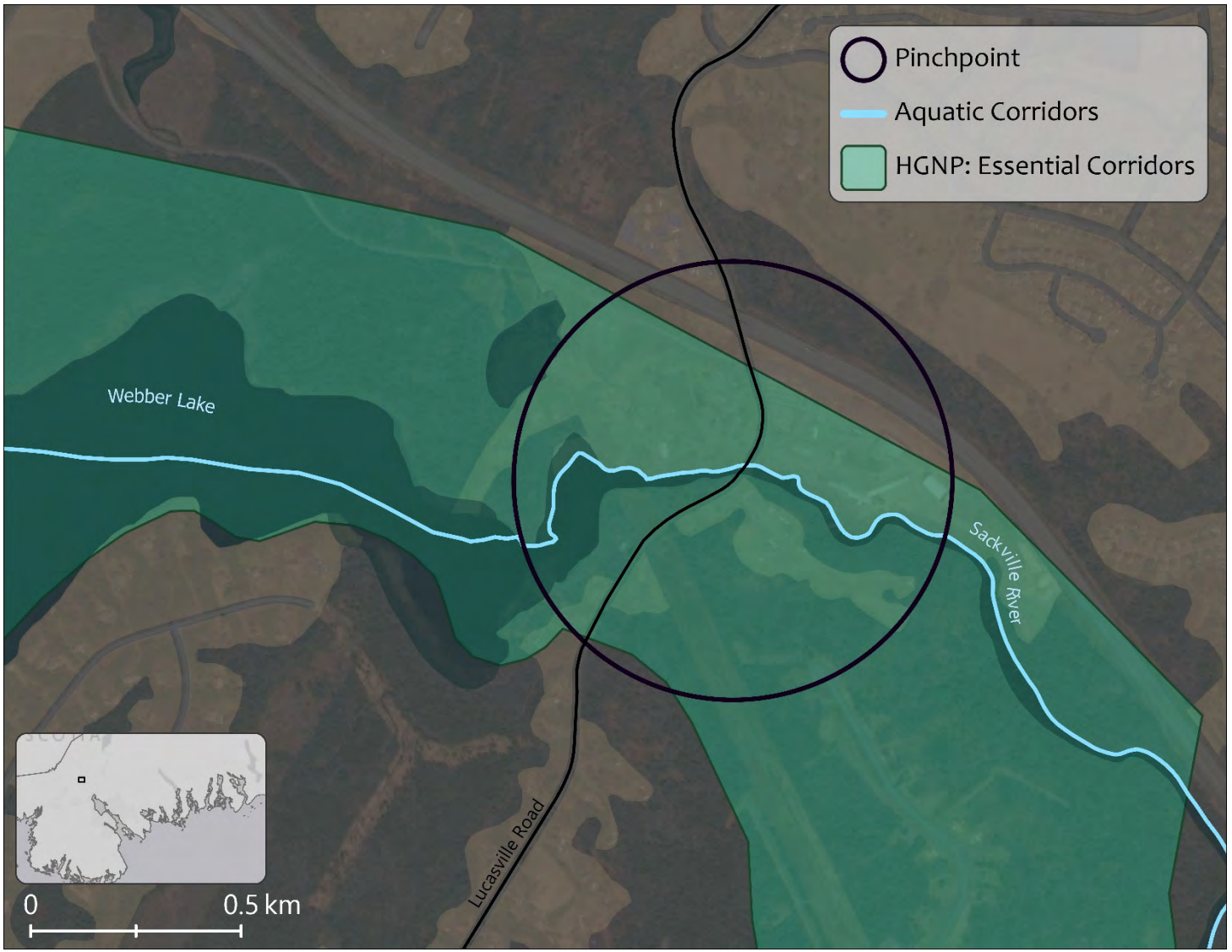


Figure 7. Pinchpoint in Aquatic Connectivity along the Sackville River at Lucasville Road near Webber Lake

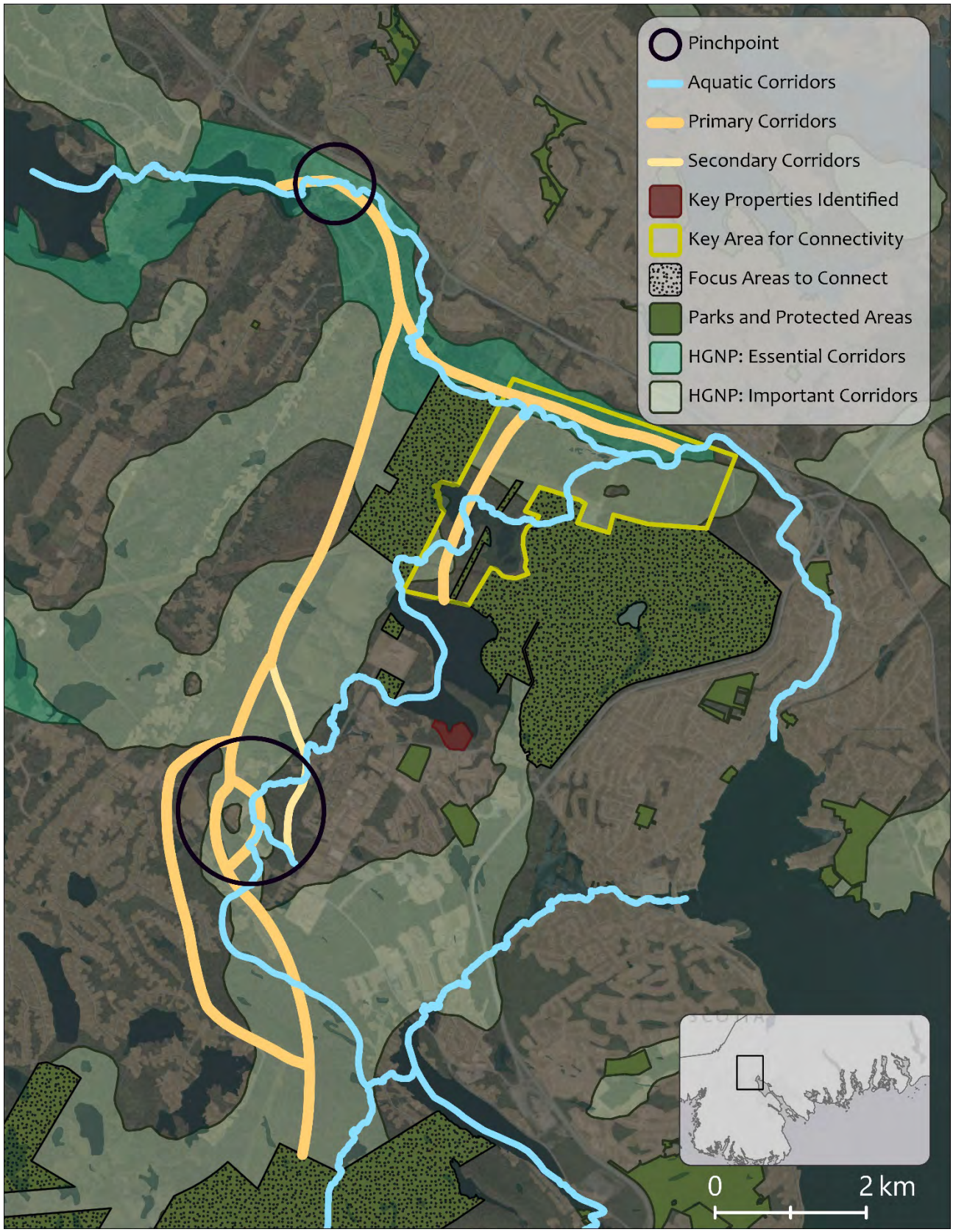


Figure 8. Summary map for the Sandy Lake to Blue Mountain Birch Cove Lakes group

BLUE MOUNTAIN BIRCH COVE LAKES TO INGRAM RIVER

Overview of the Area

The second group was focused on identifying areas for connectivity between the Blue Mountain Birch Cove Lakes (BMBCL) Wilderness Area and the Ingram River area and beyond (Figure 9). The Ingram River area is key to provincial scale connectivity, linking the Central and Western regions of the province. The St. Margarets Bay Stewardship Association has spearheaded a campaign to establish a core wilderness area on a block of Crown land formerly owned by the Bowater Mersey Paper Company, just to the north of St. Margarets Bay, as the proposed Ingram River Wilderness Area. The Halifax Green Network Plan identified two key corridors between BMBCL Wilderness Area and the Ingram River area. The wider of the two corridors flows to the north between the communities of Yankeetown and Glen Arbour, crossing Hammonds Plains Road as it continues towards the Pockwock Wilderness Area. A narrower corridor to the south flows through a more densely populated area, crossing Highway 103 twice, between the communities of Stillwater Lake and Hubley and to the west of the exit at Hammonds Plains Road, connecting also to Five Bridge Lakes Wilderness Area. Though highly developed, the latter corridor is identified as essential in the Halifax Green Network Plan.

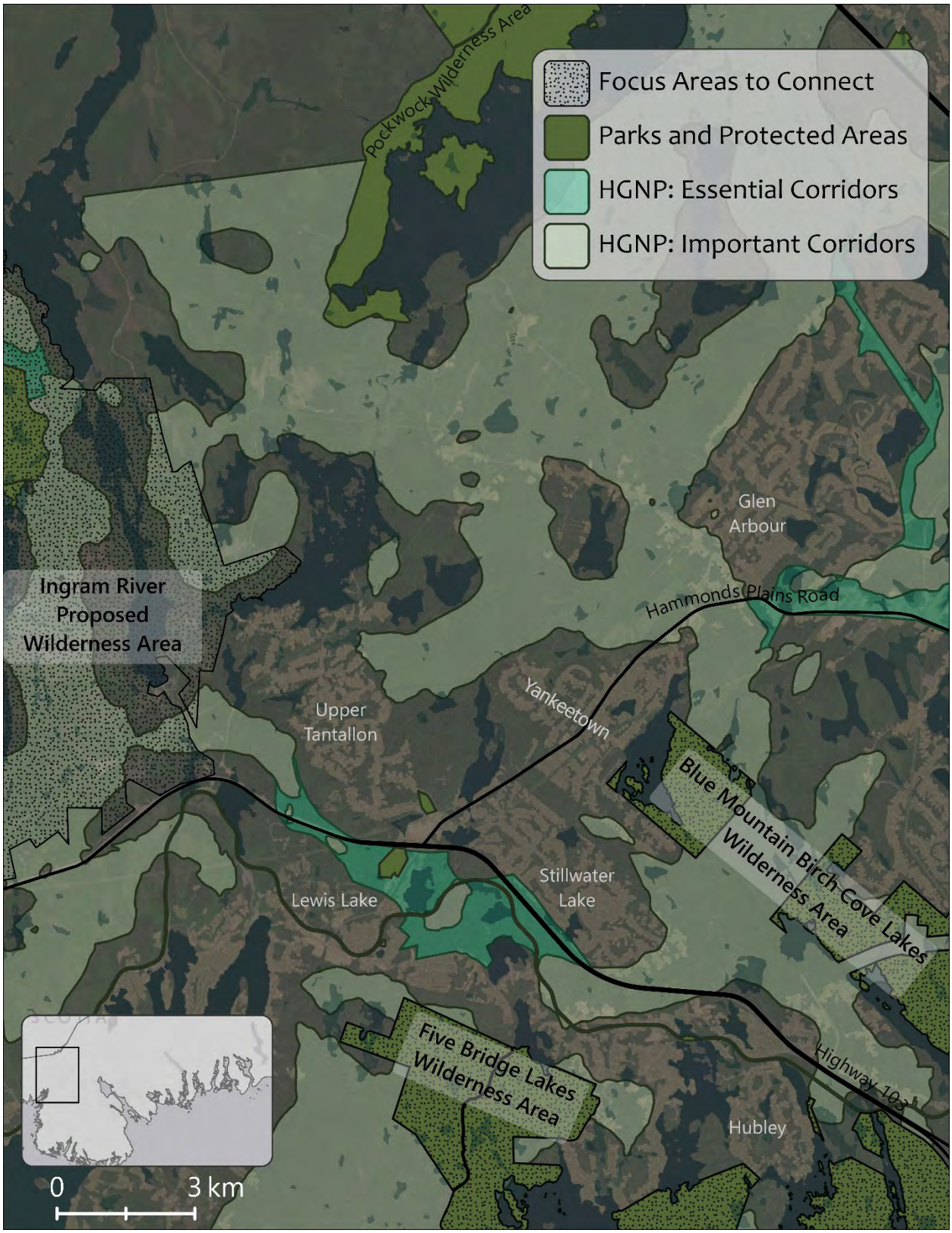


Figure 9 Overview map of the area between the Blue Mountain Birch Cove Lakes Wilderness Area and the Ingram River area

Northern Connection

A primary connection between BMBCL and the proposed Ingram River Wilderness Area flows northwards out of BMBCL towards the Pockwock Wilderness Area before turning westward towards Ingram River (Figure 10). The group noted that land ownership patterns drove the identification of potential corridors in the area, as much of it is privately owned and developed/slated to be developed. They also noted that the important corridors identified in the Halifax Green Network Plan served as a guide to finding the remaining intact corridors between the area's many subdivisions.

The area where the corridor crosses Hammonds Plains Road, between Yankeetown Road and Wallace Hill Road, was identified as a pinchpoint (Figure 11). Although it is narrow (~150 m wide), there is an intact remnant natural habitat between the communities of Yankeetown and Glen Arbour that provides an opportunity for wildlife movement along the identified corridor up towards the Pockwock Wilderness Area and the Ingram River area. Although there is development pressure, it is critical that this piece remains undeveloped as it is the only opportunity to cross Hammonds Plains Road with undeveloped land on both sides of the road within the identified corridor.

A large swath of land for connectivity was identified for potential acquisition or collaboration with the landowners (Figure 12). Properties in this area are currently owned by a variety of actors, including the Crown, Halifax Regional Water Commission and Elmsdale Lumber, the latter of which holds the properties immediately adjacent to the proposed Ingram River Wilderness Area. Properties managed by the Halifax Water Commission in this area provide connectivity to the Pockwock Wilderness Area and areas beyond HRM.

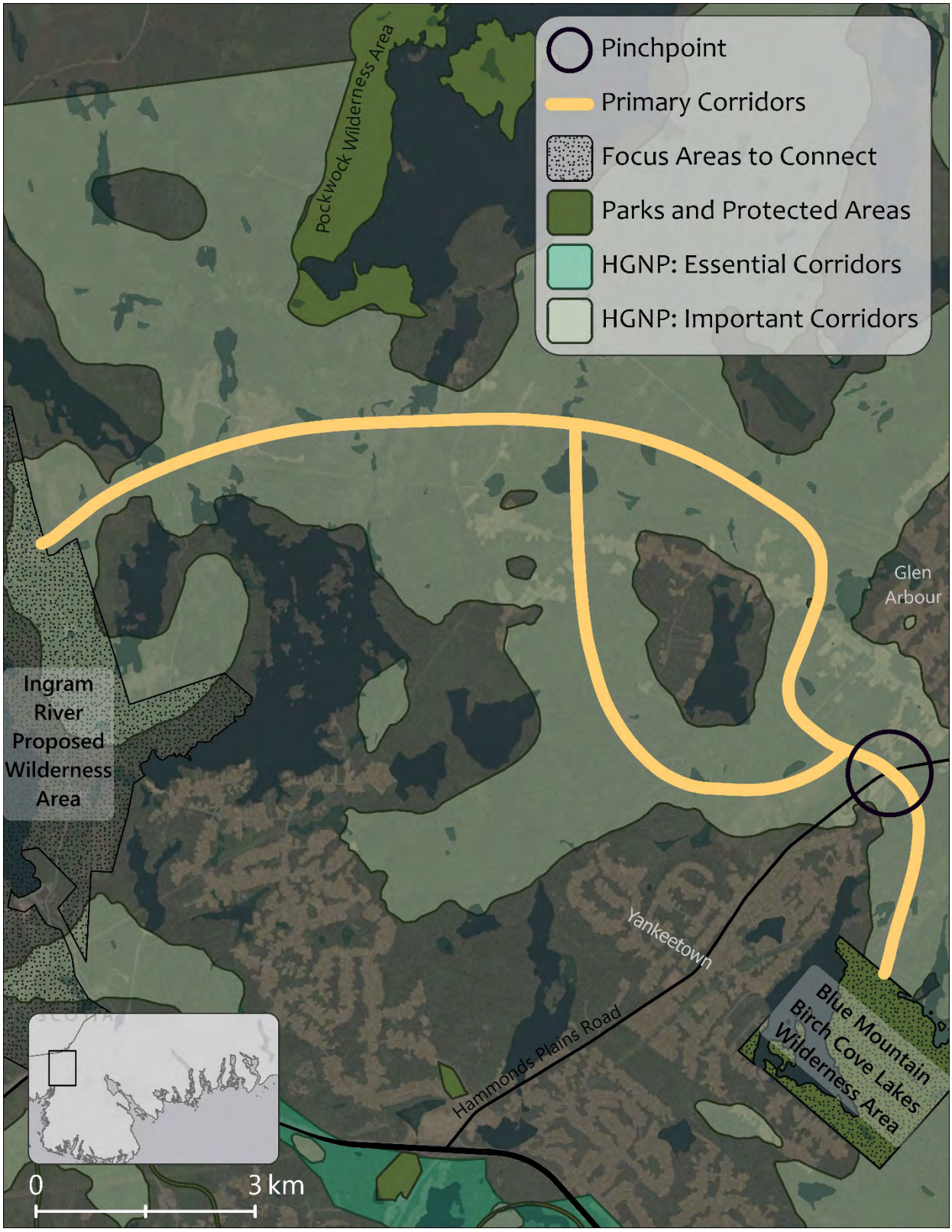


Figure 10 Corridors identified in the northern part of the area of interest

Figure 11 Pinchpoint identified in the Northern Connection where the corridor crosses Hammonds Plains Road between Yankeetown Road and Wallace Hill Road.

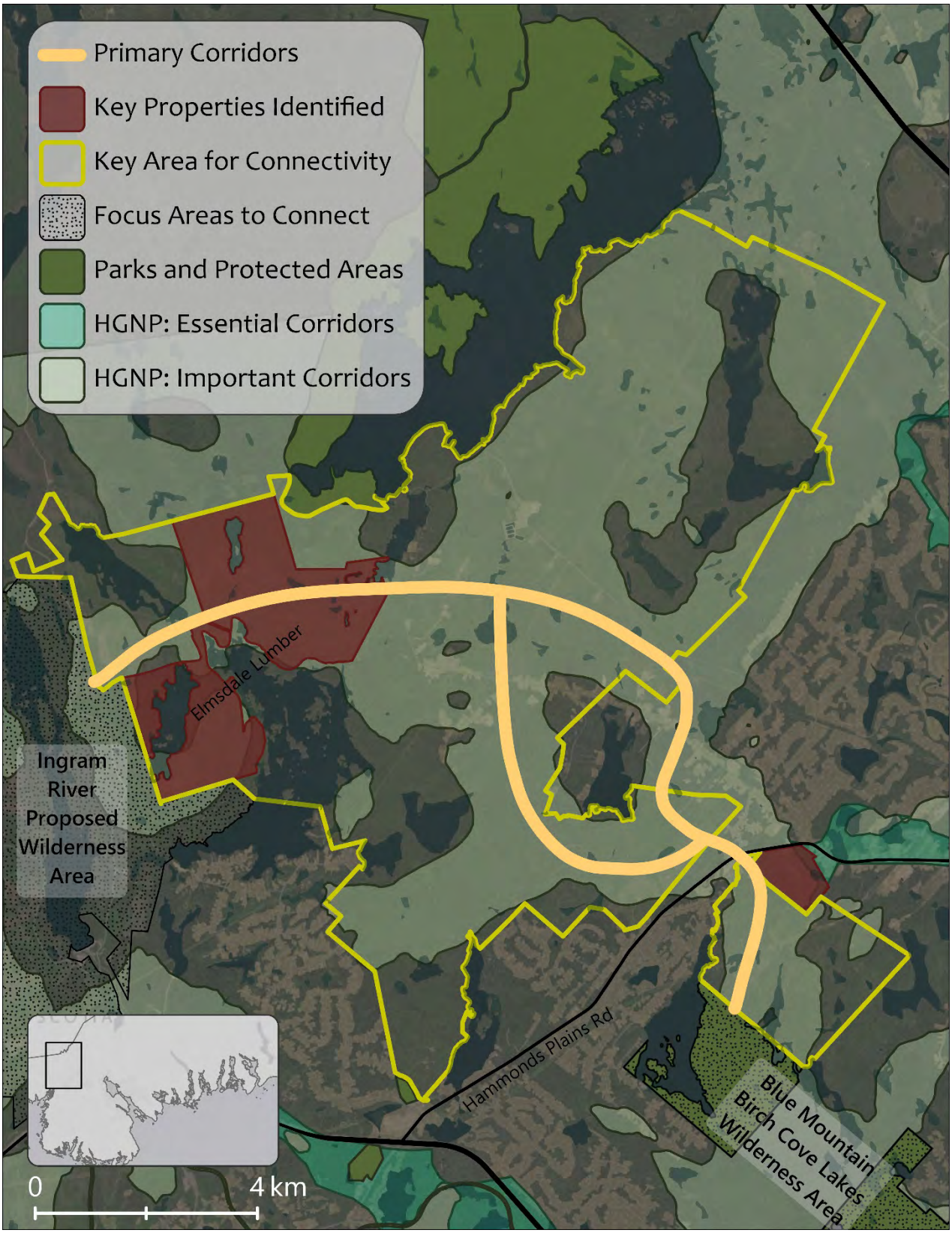


Figure 12. The key areas to manage for connectivity around the northern connection identified between Blue Mountain Birch Cove Wilderness Area and the Ingram River proposed Wilderness Area

Southern Connection

Connecting BMBCL to the Ingram River area by going south from the BMBCL is also important, though intact potential corridors are far narrower (well under 100 m) and comprise fewer opportunities for connectivity than within the northern connection (Figure 13). The corridor is identified in the Halifax Green Network Plan, with parts of it deemed essential. Connectivity along this path is highly limited to the gaps between a number of subdivisions in the area, especially in the area south of Highway 103. These paths offers opportunities to connect to the Five Bridge Lakes Wilderness Area, but this would require going through Hubley, and questions were raised about how successful this could be as it is a very narrow connection through an already narrow corridor and would likely require restoration (Figure 14).

An important opportunity to link to the northern connection was also identified (Figure 13). Just to the southwest of BMBCL there is a strip of Crown Land between the communities of Yankeetown and Stillwater Lake that provides a link towards Hammonds Plains Road, beyond which there is undeveloped land that connects to and abuts the HGNP important corridor and the northern connection in the area around Stillwater Lake. This opportunity for connectivity was not identified in the Halifax Green Network Plan but appears to be a potentially crucial option, especially given significant development pressures throughout the area.

Across the study area, important options for connectivity were identified, including opportunities for designing some redundancy into a connected system (Figure 15). Some corridor locations are situated within larger undeveloped areas and represent crucial opportunities for additional core areas and wide corridors. Other corridors are very narrow, including some that are considered essential, and are likely to require restoration, especially in key pinchpoints.

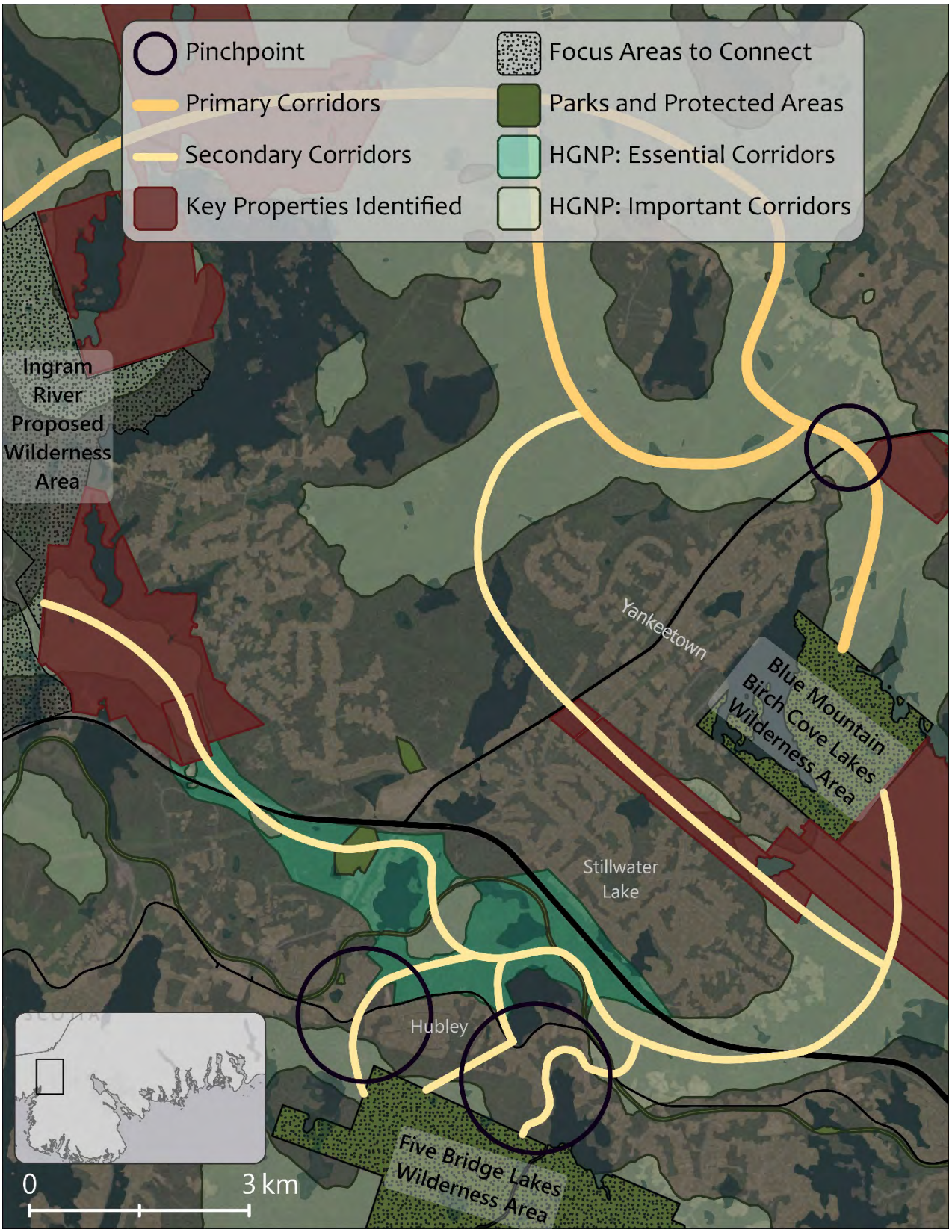


Figure 13 Corridors identified in the southern part of the area of interest

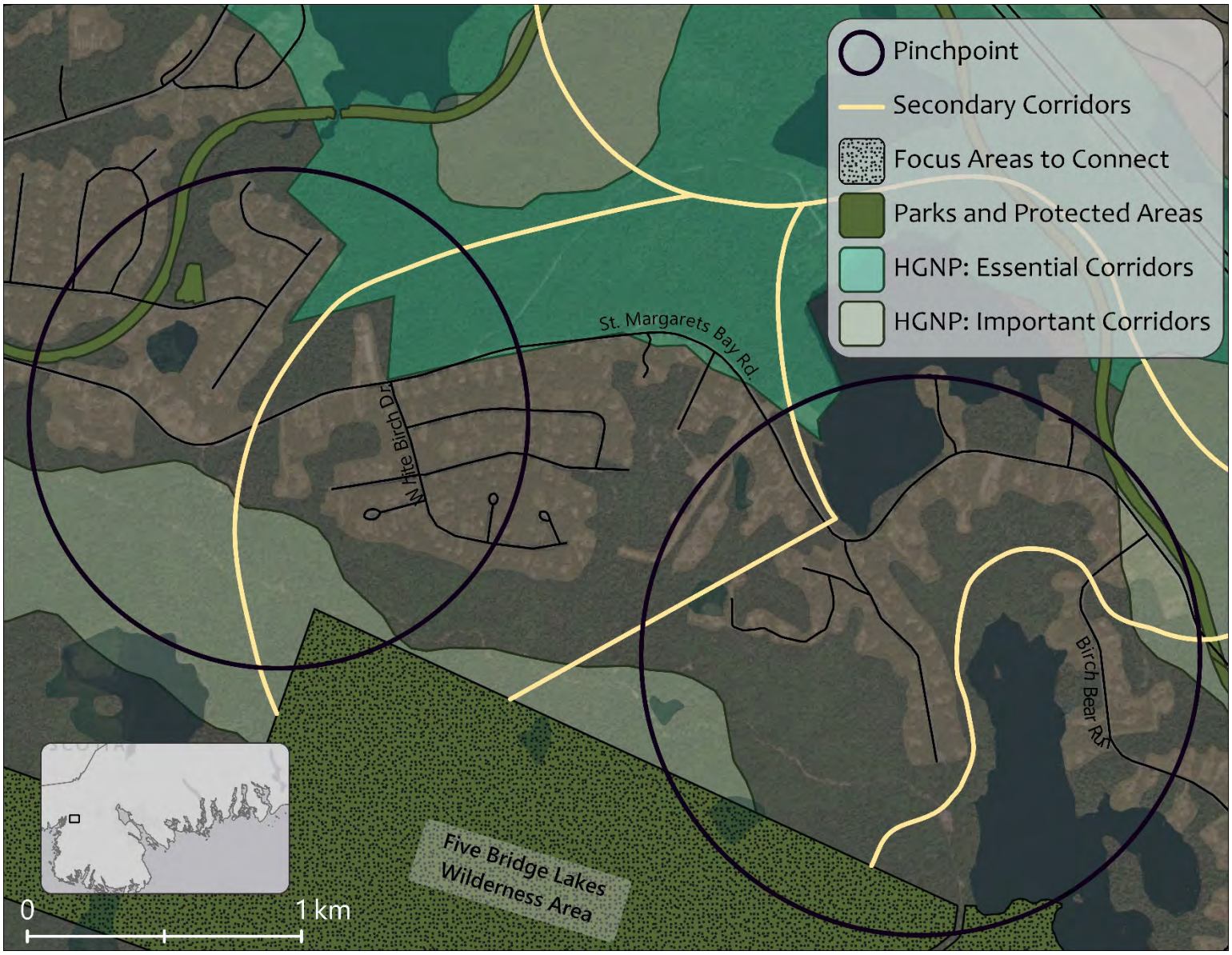


Figure 14 Pinchpoints identified that could connect the southern connection to the Five Bridge Lakes Wilderness Area

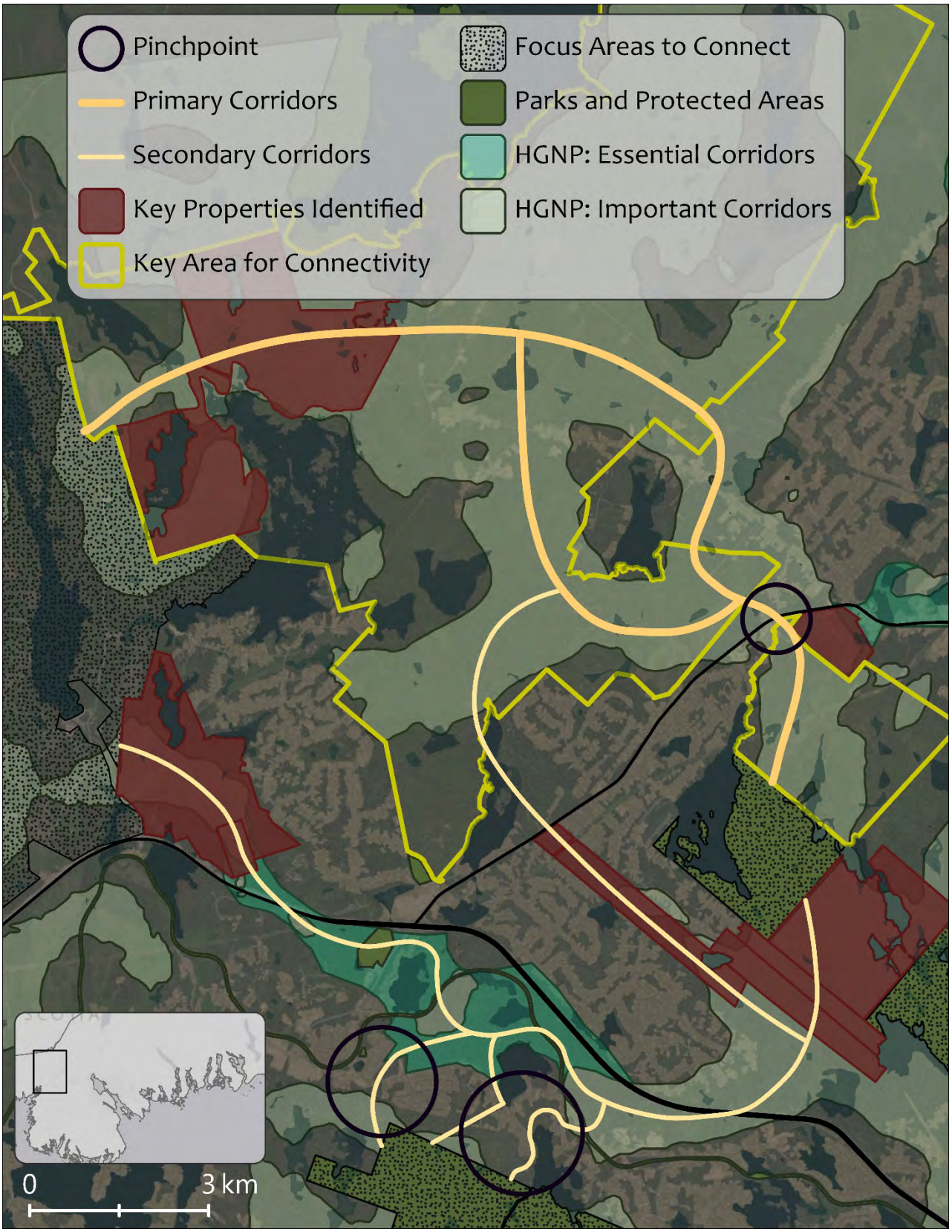


Figure 15 Summary map for the Blue Mountain Birch Cove Lakes to Ingram River Group

BLUE MOUNTAIN – BIRCH COVE LAKES TO FIVE BRIDGE LAKES WILDERNESS AREA

Overview of Area

A third group focused on opportunities for connectivity between two core wilderness areas: Blue Mountain Birch Cove Lakes (BMBCL) and Five Bridge Lakes (Figure 16). The area between the two wilderness areas is bisected by Highway 103 and St. Margarets Bay Road (Highway 3), which presents a challenge for connectivity.

The Halifax Green Network Plan identified three important corridors between the two wilderness areas. First is a corridor that crosses Highway 103 between the communities of Stillwater Lake and Hubley, as also identified as a corridor by the BMBCL–Ingram River group. The second corridor (and the widest of the three), flows from BMBCL through the Sheldrake Lake subdivision before crossing Highway 103 and entering Five Bridge Lakes. The final corridor utilizes the semi-developed land of the Links at Brunello golf course as a connector between the two wilderness areas.

The group noted that the Halifax Green Network Plan does a good job at identifying the corridors in this area. In part, this is because there is not a lot of land that remains undeveloped, so options for connectivity are limited. There are few remaining opportunities: corridors are narrow (generally just a couple of hundred meters wide) and are under threat from future urban development and road construction.

The group noted that while promoting connectivity in the area is important, so is working to expand the formal protection of land in these core areas, particularly BMBCL where several properties to prioritize for protected areas acquisition have already been identified, including lands that the Nova Scotia Nature Trust recently purchased, which are important for both connectivity and maintaining BMBCL as intact core habitat. This is consistent with the HGNP, which shows important corridors as infilling and encompassing the irregular boundaries of the wilderness areas, particularly BMBCL (Figure 16).

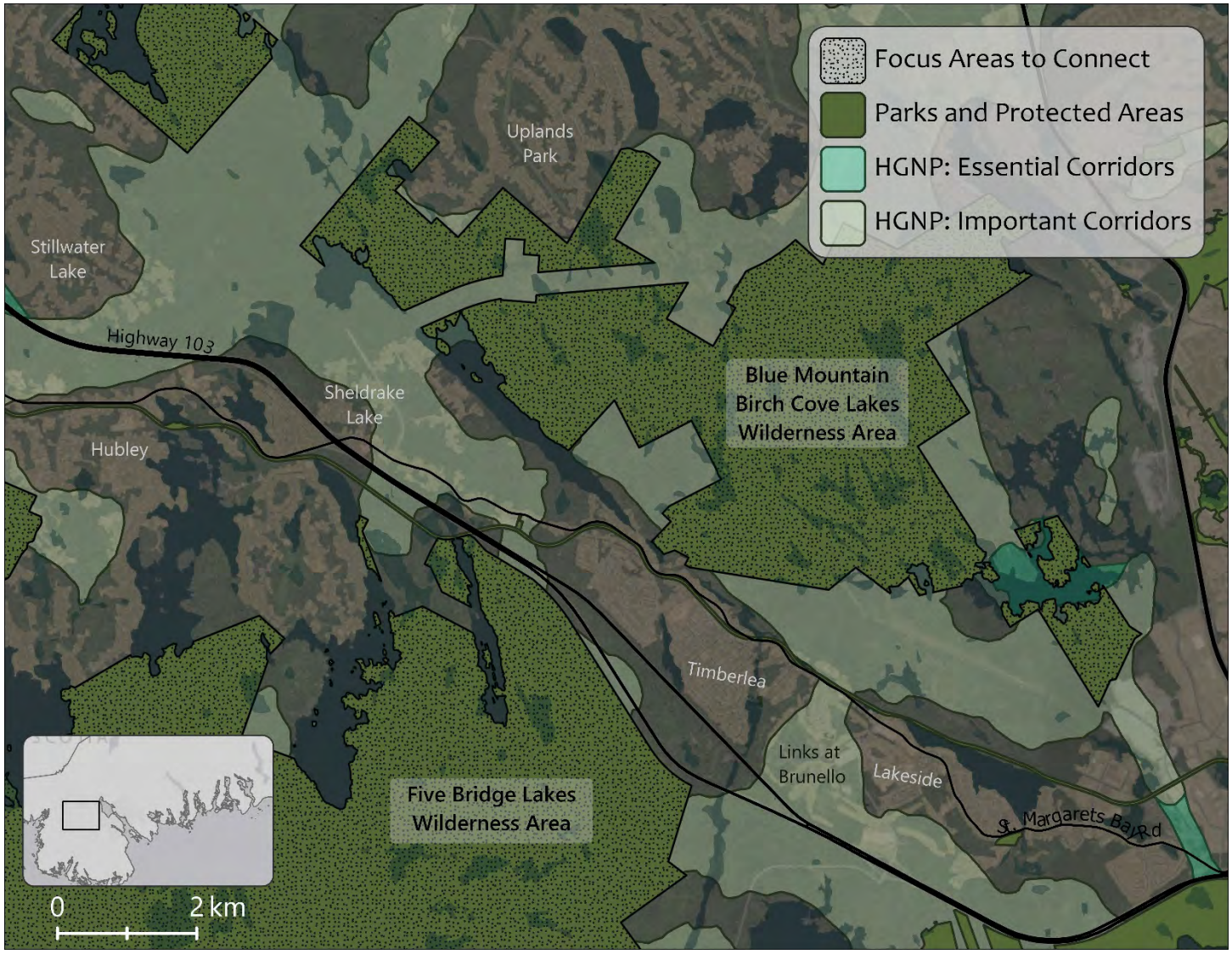


Figure 16. Overview of the area between Blue Mountain Birch Cove Lakes and Five Bridge Lakes Wilderness Areas

Primary Connection

The group identified the main connection between BMBCL and Five Bridge Lakes as the area between Glengarry Estates and Sheldrake Lake subdivisions (Figure 17). This area represents the widest area (about 1.5 km) of potential intact corridor between the two areas of interest. This potential corridor could go under Highway 103 by following the Beechville Lakeside Timberlea Trail, but the group also noted that there are spots along the Highway in this area that have the geological features that would be suitable to the construction of a wildlife overpass because the highway cuts through bedrock and the land is elevated on both sides of the highway. It was also pointed out that there is a potential barrier for terrestrial species in the form of Frasers Lake which runs the length of the gap between two subdivisions, across the path of the potential corridor. Accordingly, it remains important to seek out other opportunities for connectivity, including those requiring restoration.

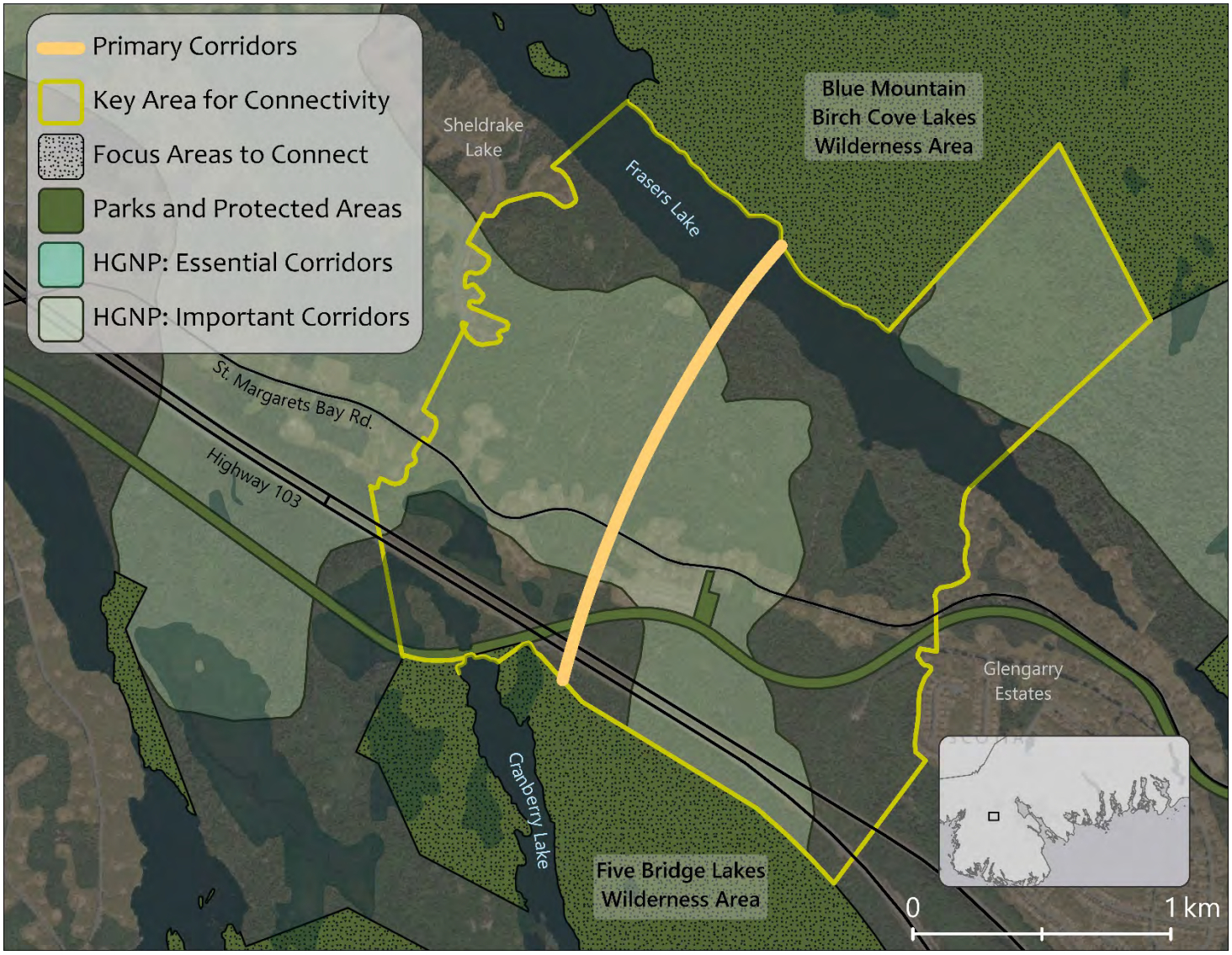


Figure 17. Primary Corridor Identified between Blue Mountain Birch Cove Lakes and Five Bridge Lakes Wilderness Areas

Secondary Connection

The group identified the same secondary connection as the BMBCL–Ingram River group, connecting the BMBCL to Five Bridge Lakes through NS Nature Trust lands, crossing Highway 103 between the communities of Stillwater Lake and Hubley along the corridor identified in the Halifax Green Network Plan (Figure 18).

Like the BMBCL–Ingram River group, this group identified Crown Land between the communities of Yankeetown and Stillwater Lake as being important for connectivity. Additionally, they point to the two properties between this piece of Crown Land and the lands NS Nature Trust recently purchased as being important to retain in an undeveloped state. In regard to the Crown land, the group notes that there may be the possibility of land swaps to benefit connectivity around Maple Lake (which was identified as being important for both north-south and east-west connectivity), which is under pressure from proposed development (both residential pressures and interest about a potential access road to connect Sussex Dr to Eider Dr.) that would block off potential for connectivity, which is currently key to connecting the Chebucto peninsula to the northern part of the province.

The group identified a potential corridor that branches off the one also identified by the BMBCL–Ingram River group, which goes between Maple and Upper Sheldrake Lakes before crossing Highway 103 and St. Margarets Bay. Once on the south side of the roads, the corridor branches in two, continuing south through the Sheldrake Lake subdivision, connecting to Five Bridge Lakes on the western side of Frederick Lake and following the Beechville Lakeside Timberlea Trail to Five Bridge Lakes near Cranberry Lake.

It was also noted that the Links at Brunello golf course is a relatively low impact development that could contribute to connectivity for some species across the southern extent of the area of interest (Figure 19). They note that there are existing culverts in place that may be able to be upgraded to an open bottom culvert or bridge to enhance connectivity in the area.

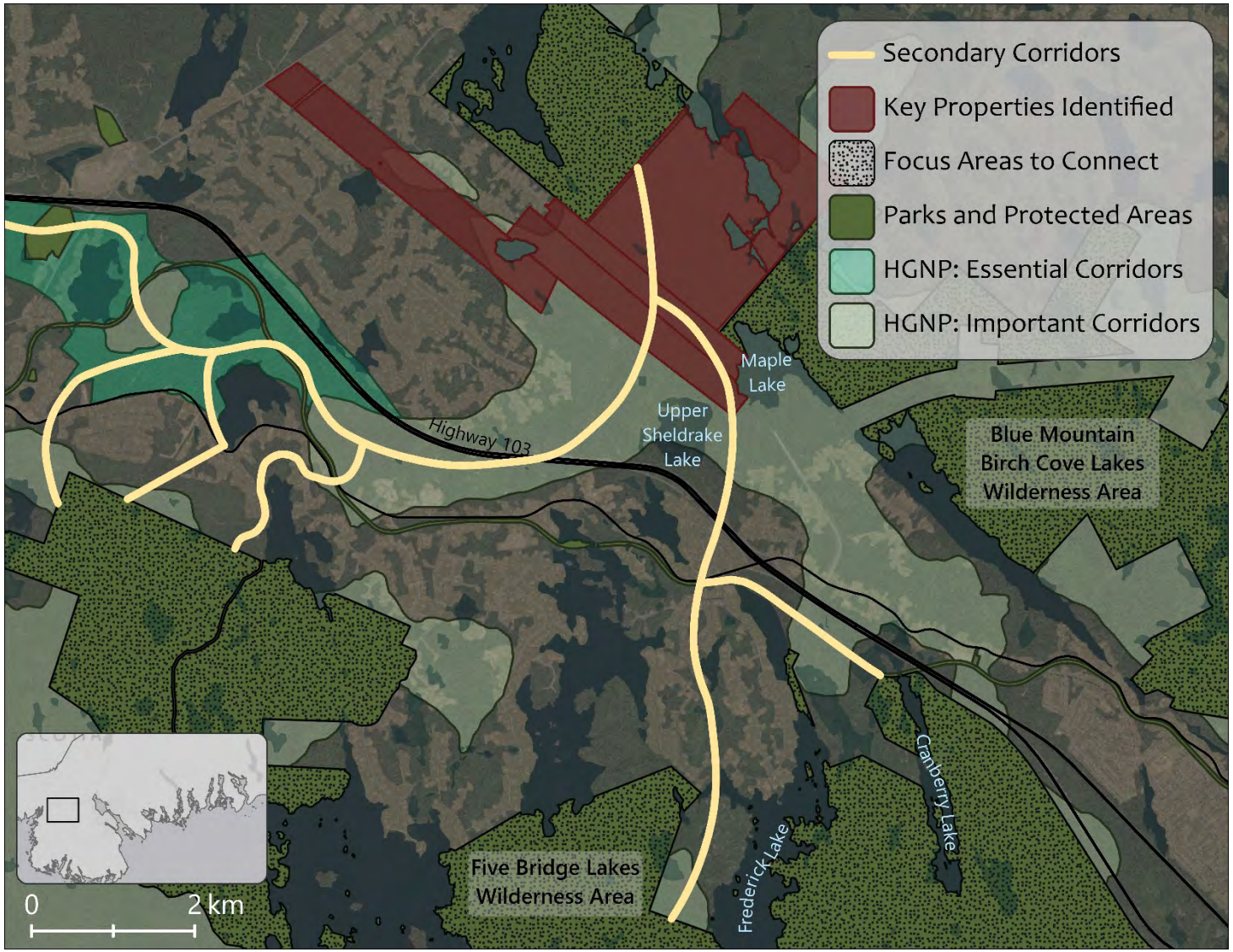


Figure 18. Secondary connection identified between Blue Mountain Birch Cove Lakes and Five Bridge Lakes Wilderness Areas

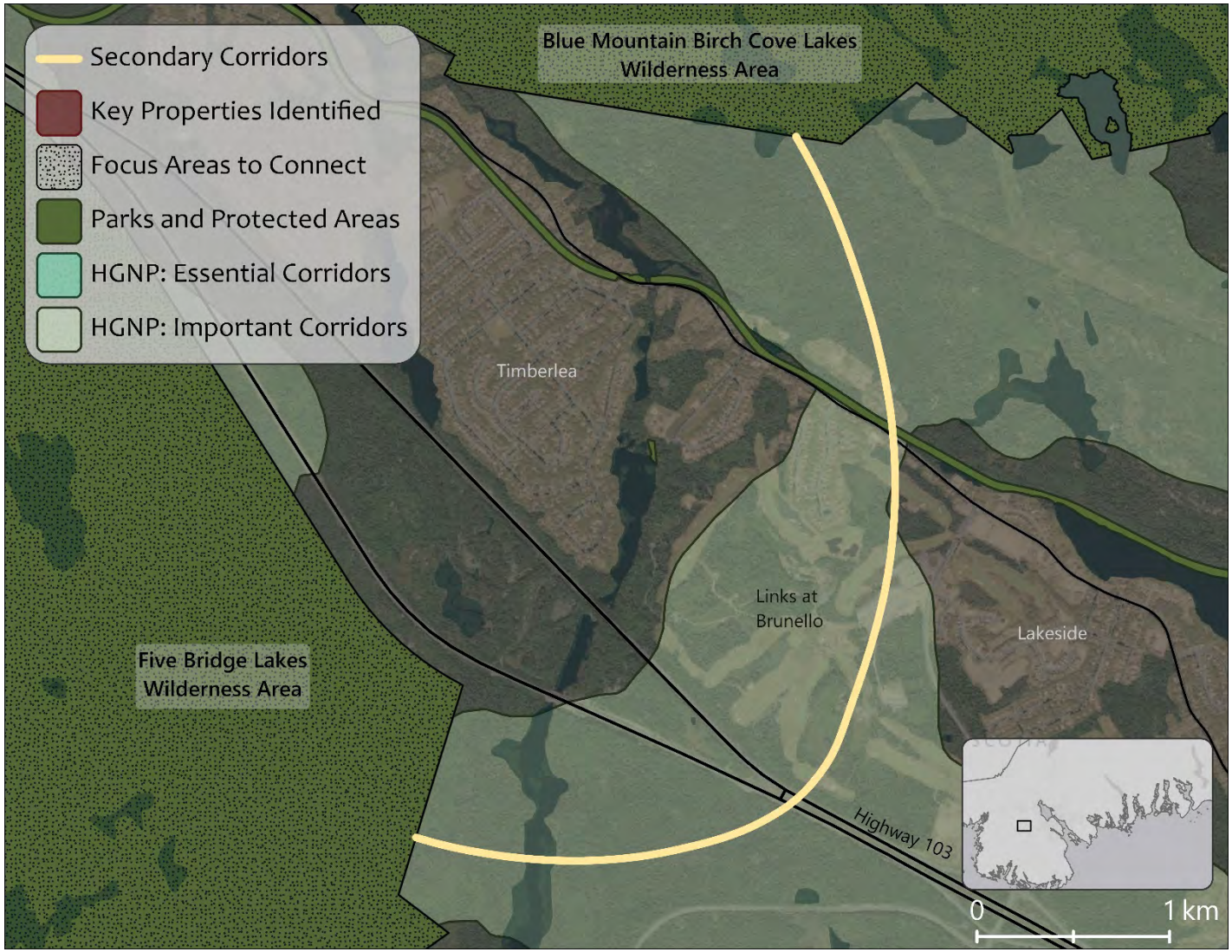


Figure 19. Secondary connection identified between Blue Mountain Birch Cove Lakes and Five Bridge Lakes Wilderness Areas that utilizes the Links at Brunello Golf Course

Riparian and Aquatic Connection

In addition to terrestrial connectivity, the group considered riparian and aquatic connectivity between the two wilderness areas, noting that there is the potential to connect the two areas of interest along the Nine-Mile River, as well as a couple of streams around Governor Lake, Lovett Lake and Black Duck Ponds in the Beechville/Lakeside area (Figure 20).

Points were also raised about aquatic connectivity between BMBCL and the ocean through the Kearney Lake River system to the Bedford Basin. This connection would also link up to the aquatic connections identified by the Sackville River-Sandy Lake to BMBCL group.

Combined, the terrestrial and aquatic areas of connectivity identified for this area of interest roughly support corridors identified in the HGN plan, while noting existing barriers to connectivity and opportunities for restoration (Figure 21).

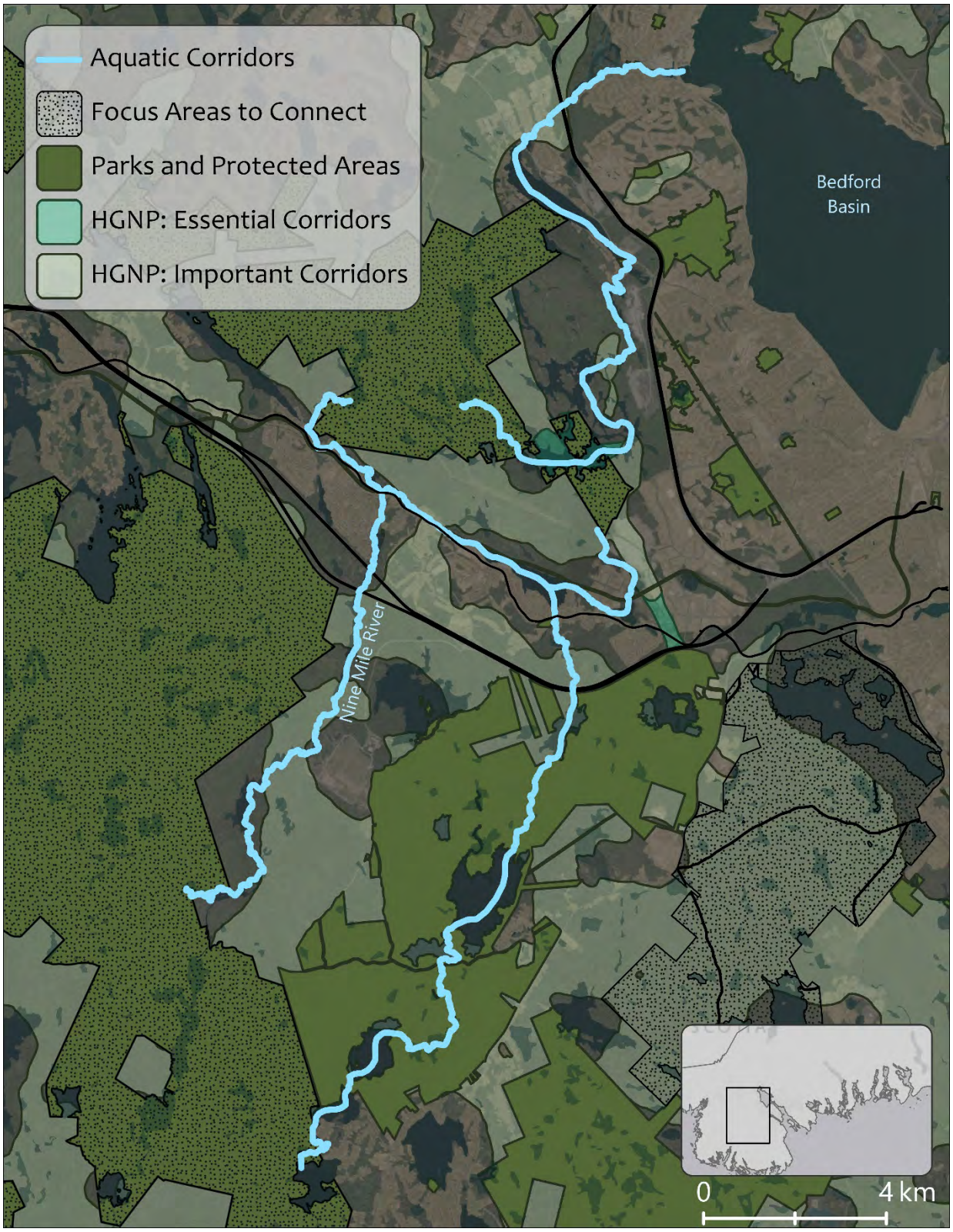


Figure 20. Aquatic Connectivity between Blue Mountain Birch Cove Lakes and Five Bridge Lakes Wilderness Areas as well as Blue Mountain Birch Cove Lakes Wilderness Area and the Bedford Basin via. the Kearney Lake watershed

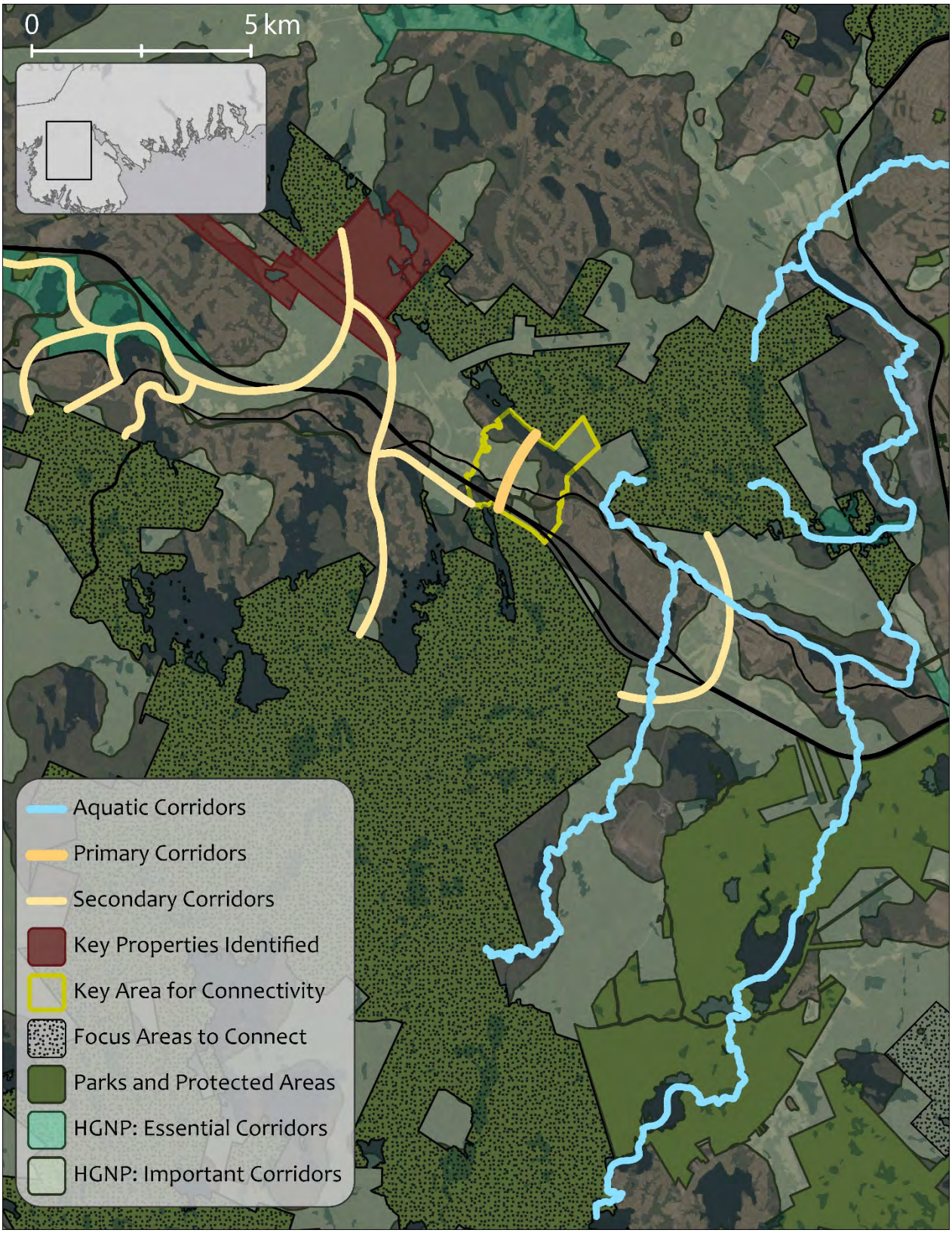


Figure 21. Summary Map for the Blue Mountain Birch Cove Lakes Wilderness Area to Five Bridge Lakes Wilderness Area group

FIVE BRIDGE LAKES WILDERNESS AREA TO LONG LAKE PROVINCIAL PARK AND THE BACKLANDS

Overview of Area

A fourth group focused on connectivity between Five Bridge Lakes Wilderness Area, Long Lake Provincial Park and the Backlands (Figure 22). While there are no major highways acting as barriers for connectivity between these areas, there are several major roads that impact connectivity in the area, namely Herring Cove Road, Old Sambro Road and Prospect Road. Within this area of interest there are several relatively large patches of natural habitat, including the Terrace Bay Wilderness Area, Western Common and several parcels of unprotected Crown Land.

Like the Blue Mountain Birch Cove Lakes to Five Bridge Lakes group, this group noted that while promoting connectivity in this area is important, so is working to expand the protection of core areas of habitat, as much of this area remains undeveloped, but also unprotected and under threat from future development. This is consistent with indications of wide areas of important corridors in the HGNP (Figure 22).

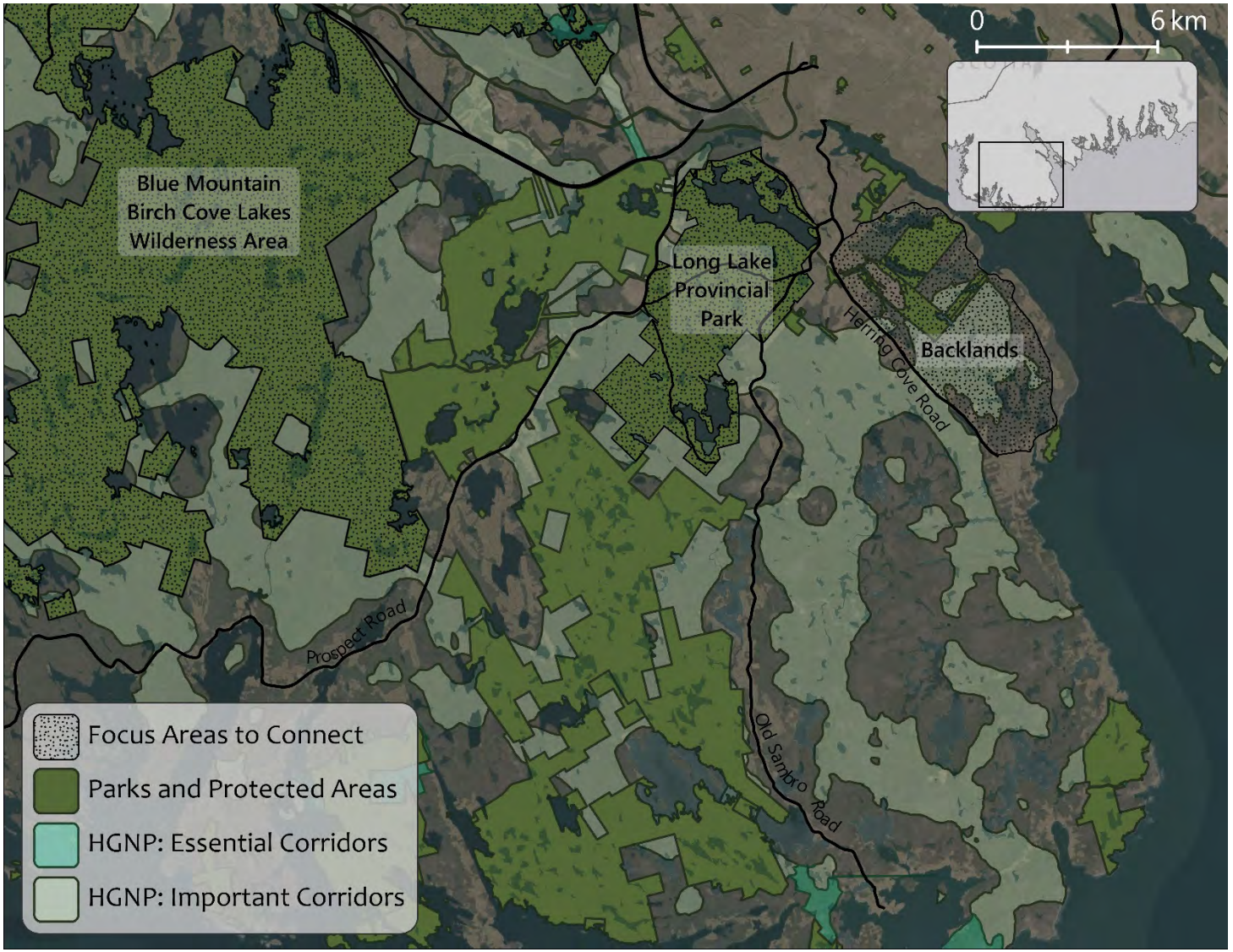


Figure 22. Overview of the area between the Five Bridge Lakes Wilderness Area, Long Lake Provincial Park and the Purcell's Cove Backlands

The Backlands

The group looked at connectivity within the Backlands and identified several properties that should remain undeveloped to maintain connectivity (Figure 23). The primary corridor identified connects Frog Pond Park and the Nova Scotia Nature Trust's Backlands property. The corridor first crosses Williams Lake Road and then goes through several key undeveloped properties before reaching Shaw Wilderness Park and Colpitt Lake (Figure 23). The group also identified a key pinchpoint along this corridor where it crosses Williams Lake Road (Figure 24). On the other side of the Wilderness Park, key properties were identified to ensure a connection to the Nova Scotia Nature Trust's lands. Another key connection was identified between Long Lake Provincial Park and the Backlands, flowing between Old Sambro Road and the Catamaran Ponds was identified as an important wildlife corridor (Figure 23).

Three smaller, secondary connections were identified linking a large, undeveloped piece of Crown land in the Backlands to Herring Cove Provincial Park Reserve, York Redoubt National Historic Site and Connaught Battery Park across Purcell's Cove Road and John Brackett Drive (Highway 253) (Figure 23).

Figure 23. Connectivity within the Backlands

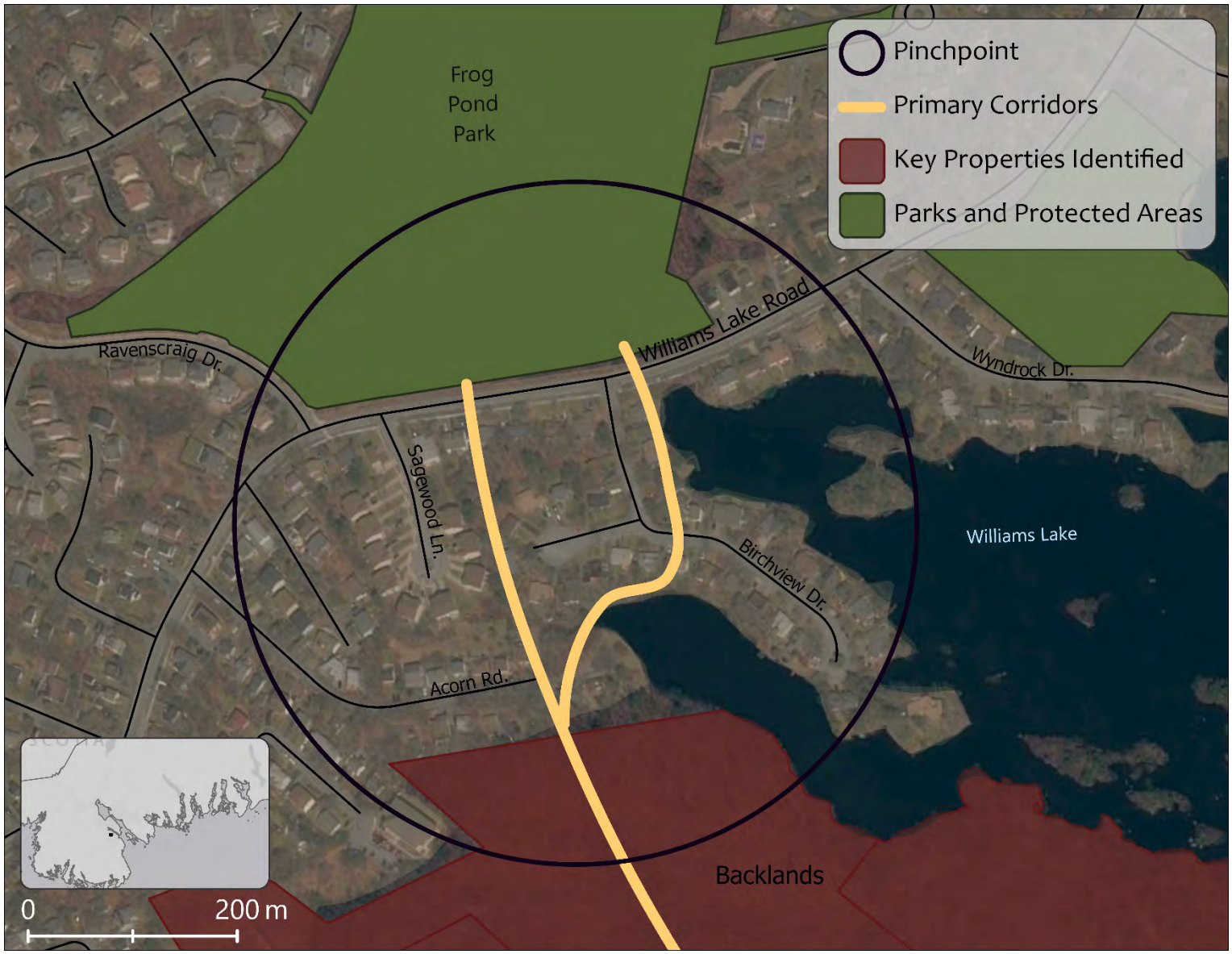


Figure 24. Pinchpoints identified around Williams Lake Road on the corridor connecting Frog Pond Park and the Backlands.

The Backlands to Terrace Bay Wilderness Area and Long Lake Provincial Park

Moving out of the Backlands towards the Terrace Bay Wilderness Area and Long Lake Provincial Park, the first major barrier to connectivity is Herring Cove Road. The group identified several places along the road where development on either side is relatively thin or non-existent between the communities of Herring Cove and Spryfield for potential wildlife crossings (Figure 25).

Beyond Herring Cove Road, a large parcel of Crown land was identified as critical to the conservation strategy of the area. If left undeveloped, the Crown land will continue to act as core habitat and provide contiguity with Long Lake Provincial Park and Terrace Bay Wilderness Area. The group also identified two opportunities for connectivity across Old Sambro Road at locations of large parcels of undeveloped land (currently owned by a development company), which provide natural habitat on both sides of the road in gaps between subdivisions.

The group discussed the importance of securing properties between Long Lake Provincial Park and Terrace Bay Wilderness Area for the long-term protection and expansion of these core habitats. They reported that there has been talk of constructing a road through these lands to connect Harrietsfield and Goodwood, which would disrupt the connectivity that currently remains between the two existing protected areas.

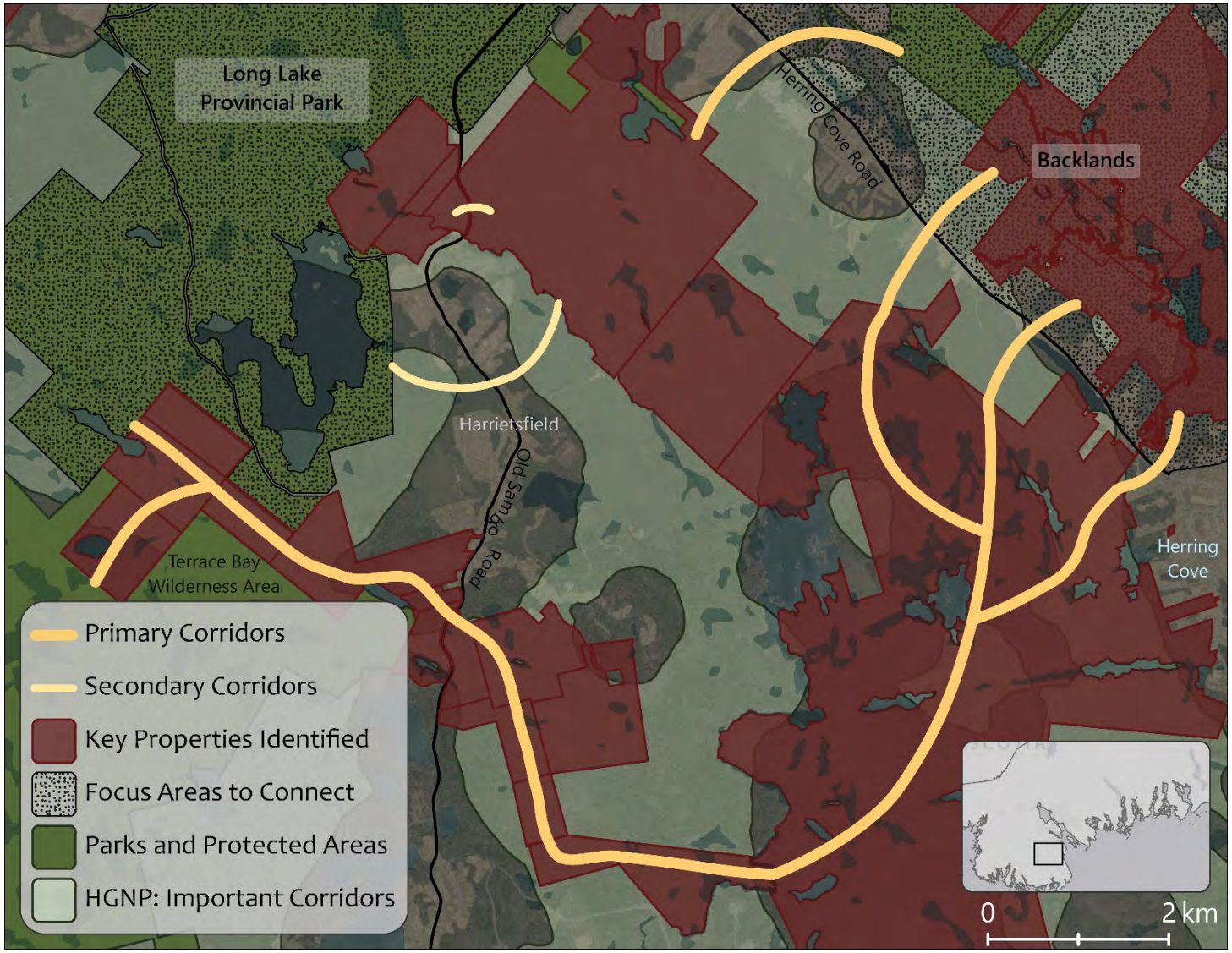


Figure 25. Connectivity between the Backlands and Long Lake Provincial Park and Terrace Bay Wilderness Area

Terrace Bay Wilderness Area and Long Lake Provincial Park to Five Bridge Lakes Wilderness Area

The Western Common and the HRM-owned lands adjacent to it provide opportunities for connectivity across Prospect Road, connecting Long Lake Provincial Park to Five Bridge Lakes Wilderness Area (Figure 26). The group noted that there are a few low-hanging fruits for connectivity across the road where there is parkland on both sides of the road. However, these are not the only opportunities for connectivity, but the others would require connections between currently unprotected (though undeveloped) parcels.

The group made the case that all of the lands and waters between Long Lake Provincial Park and Terrace Bay and Five Bridge Lakes Wilderness Areas should be managed for connectivity because, despite the Otter Lake Landfill and other areas of disturbance, there likely remains high permeability for many species of wildlife through the area. They also note that by doing so, it would provide a wide (~6 km) corridor which would serve black bear and other large and/or sensitive wildlife species.

A corridor between Five Bridge Lakes and Terrace Bay Wilderness Areas that also builds a connection to the Roges Roost Wilderness Area was identified (Figure 27). The corridor largely follows an important corridor identified in the Halifax Green Network Plan in the area to north of Shad and Prospect Bays.

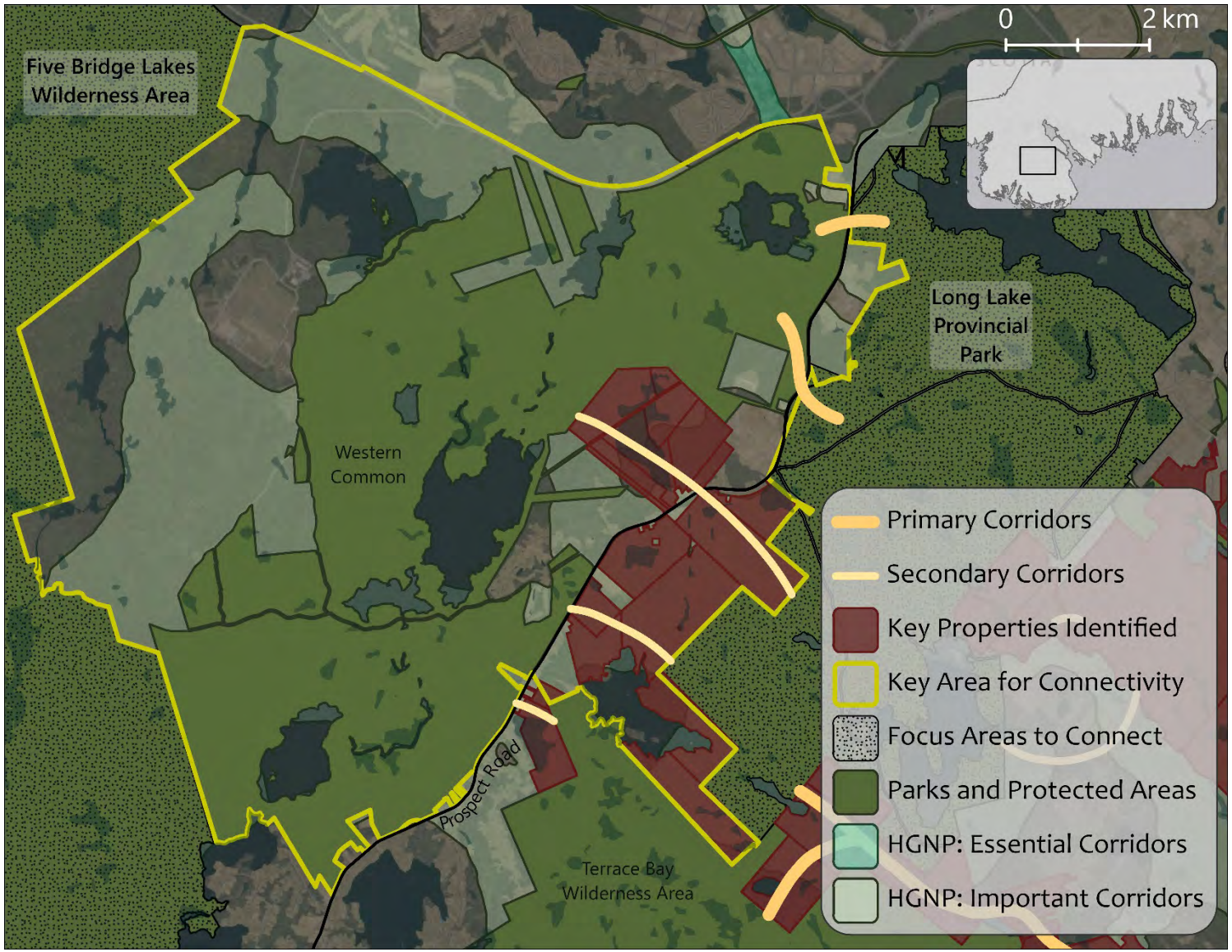


Figure 26. Connectivity between Long Lake Provincial Park and Five Bridge Lakes Wilderness Area, highlighting the key area around the Western Common and connections over Prospect Road.

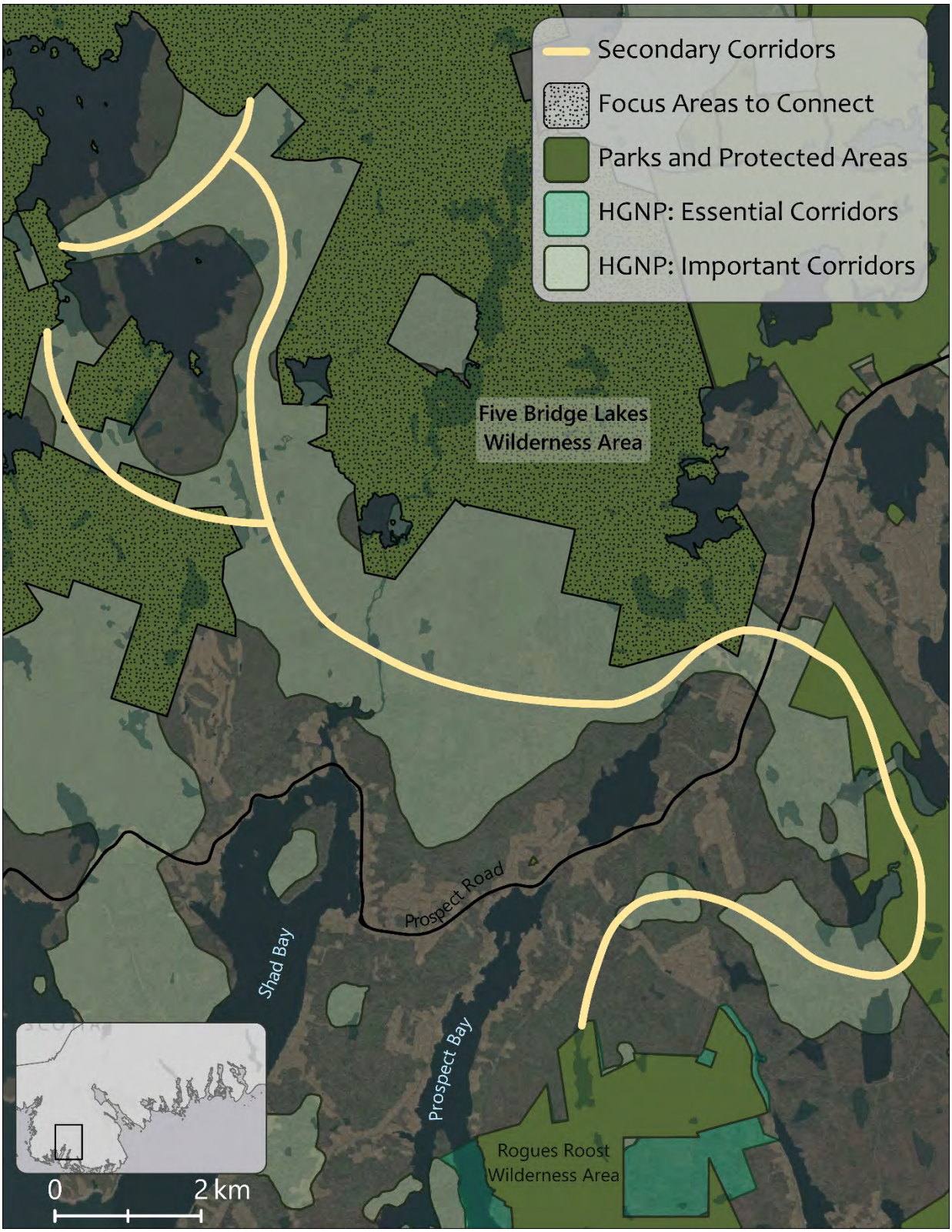


Figure 27. The corridor identified between Five Bridge Lakes, Terrace Bay and Rogues Roost Wilderness Areas.

Aquatic Connectivity

Several corridors for aquatic connectivity in the Backlands were identified (Figure 28). The first is Governor's Brook which flows from two Catamaran Ponds behind the Sobeys in Spryfield to Colpitt and Williams Lake. The Catamaran Ponds are the headwaters for Colpitt and Williams Lake and thus need to be adequately protected. Secondly, although it is a relatively built-up area, there is the possibility for aquatic connectivity between Long Lake and Kidston Lake through Spryfield. An aquatic connection between Long Lake and Herring Cove through the MacIntosh Run and Pine Islands Ponds was also identified.

Together, these key properties and corridors represent crucial opportunities for protecting core areas and connectivity in a region that comprises relatively large and intact parcels of Crown and other undeveloped lands (Figure 29). Much of these lands abutt and overlap important corridors identified in the HGNP. Despite their condition at present, important threats to connectivity exist due to existing and potential future road and other developments and or resource extractions.

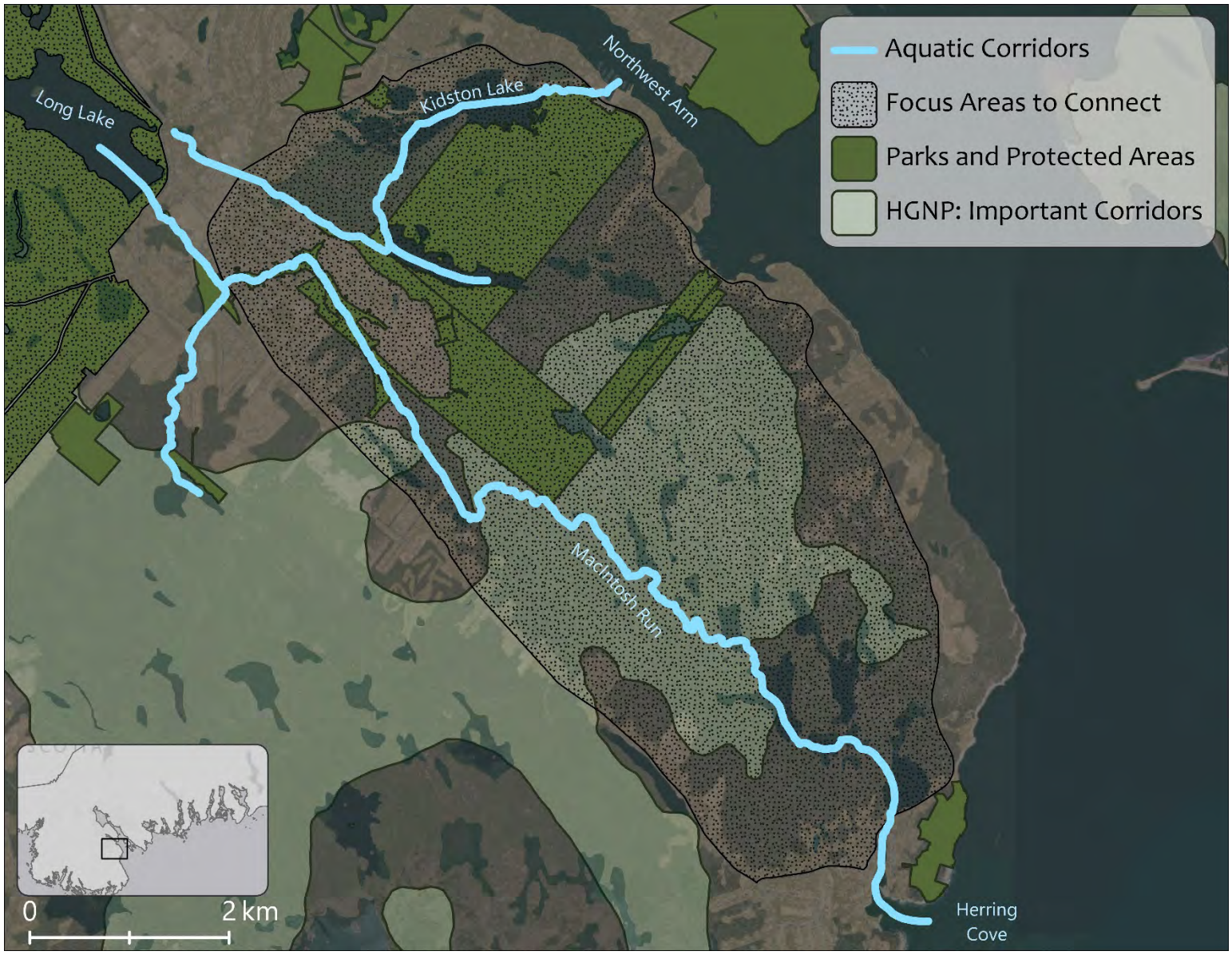


Figure 28. Aquatic Connectivity in the Backlands

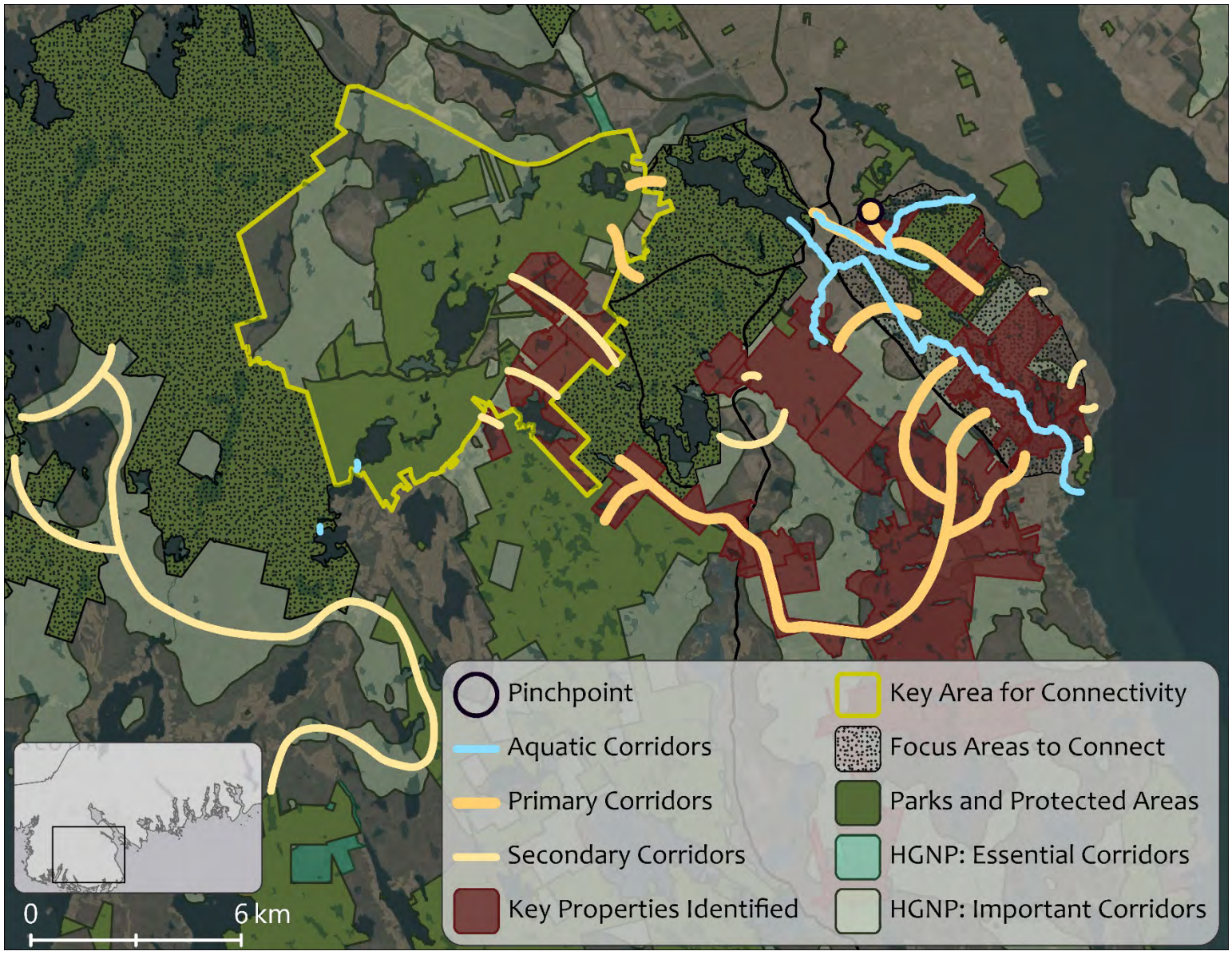


Figure 29. Summary map for the Five Bridge Lakes Wilderness Area to Long Lake Provincial Park and the Backlands group

Summary

Putting together the products of all four groups produces a conceptual map for wildlife corridors through a critical yet threatened part of HRM, where the Chebucto Peninsula connects with the rest of mainland Nova Scotia. The mapped area of interest extends from the Sandy Lake-Sackville River area through BMBCL to the Ingram River area and through Five Bridge Lakes, Terrance Bay and Rogues Roost Wilderness Areas and Long Lake Provincial Park to the Backlands. While many of these corridors follow those that were identified in the Halifax Green Network Plan, some are not, highlighting the importance of considering connectivity at the fine scale and communicating with those who have an intimate knowledge of the local landscape (Figure 30).

It is important to note that while the corridors in the maps throughout this document are symbolized by thin lines, they should not be interpreted as such. Rather, the lines showing the corridors represent the centerlines of corridors, the width of which should be as large as possible. In addition to the indicated corridors, numerous key properties for the maintenance or restoration of connectivity were identified. Currently, these properties are not explicitly managed for wildlife corridor conservation and are owned by a number of different landowners including the Crown, HRM, lumber and utility companies, and private developers. Each group also identified at least one broad swath of land which is crucial to connectivity, and also for expanding core areas for conservation. These areas represent prime opportunities for buffering, supplementing, or expanding core areas, and for securing corridors wide enough to serve large and sensitive species of wildlife while safeguarding against edge-effects and human land uses and activities along their boundaries. Other areas crucial to connectivity are currently limited to narrow corridors and several require restoration. Nonetheless, they are important to secure as remaining remnants of essential corridors and for planned redundancy within the connected network.

In the areas of HRM focused upon in this report, as is likely the case in much of HRM, opportunities for conserving wildlife connectivity are being lost daily. It is imperative that systematic planning that precisely identifies and delineates the boundaries of core areas and corridors in a green/ecological network design be completed in the very near future. Strategic short-term and long-term measures that implement the protection of core areas and corridors need to be developed and put in place. Moving forward, in addition to formal land conservation through land securement (e.g., land purchase, conservation easements), creative mechanisms for maintaining and restoring connectivity in key areas will be required, such as: zoning; right of first refusal for purchasing key private properties; formal easements and rights of ways along riparian areas, through subdivisions and along roadways; planned corridors associated with land development approvals; and road mitigation measures such as fences, overpasses, underpasses, bridges and box culverts.

Many local individuals and groups have formal and experiential knowledge of the land, wildlife, and connectivity planning. Collaborative partnerships between governments at all levels, including the Mi'kmaq, non-government organizations and other interested parties, and citizens would support the co-production of knowledge while building constituents of support.

The charrette has served to expand the understanding of issues, priorities and opportunities relating to ecological connectivity within the context of the Chebucto Peninsula and the greater Mainland and, by extension, within Nova Scotia and between Nova Scotia and continental North America.

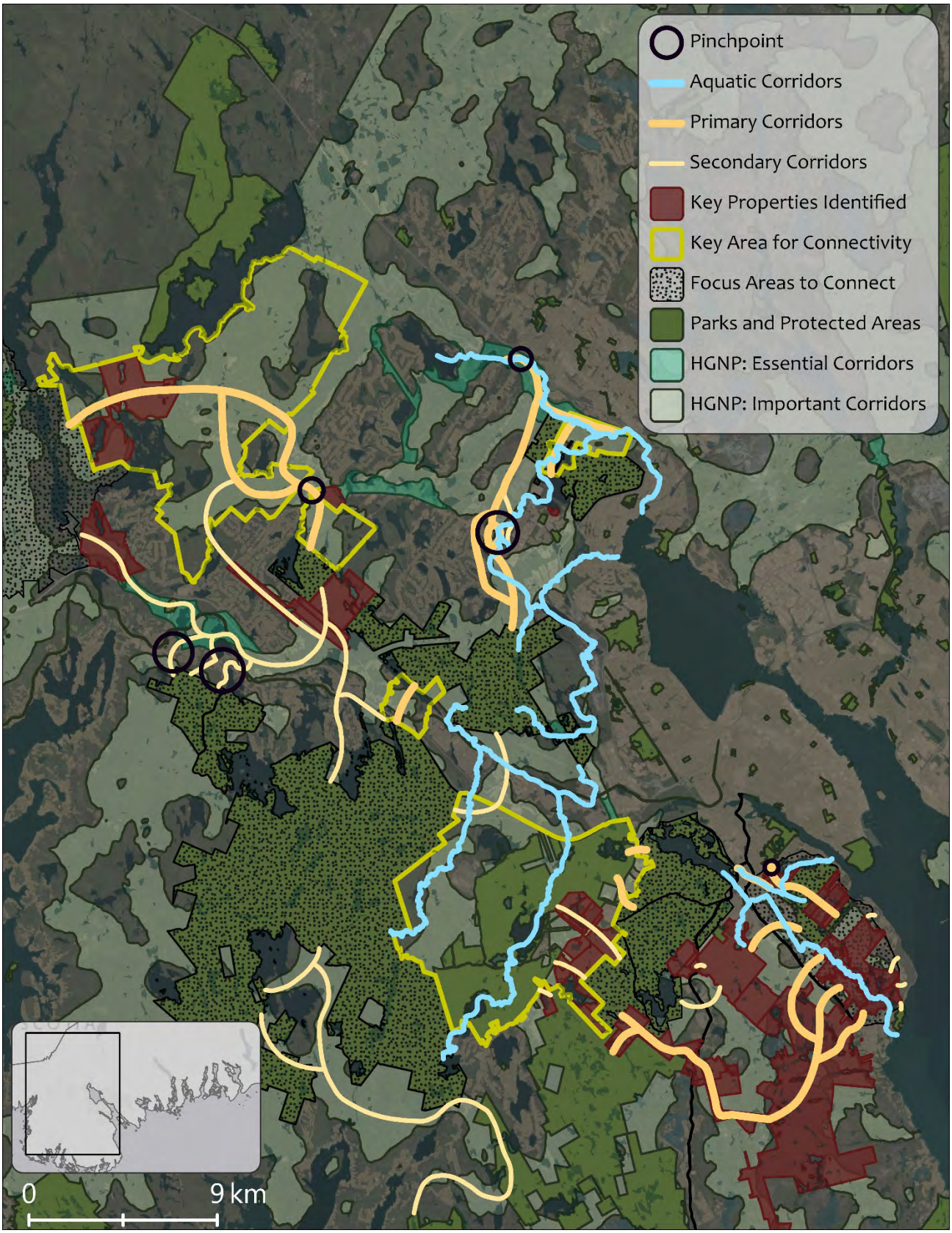


Figure 30. Summary map showing the work of all of the groups during the charrette

In order to move beyond understanding toward specific efforts to ensure ecological connectivity is protected (or restored where already compromised), it is useful to consider next steps as informed by the charrette exercise, including:

- advance recommendations through the ongoing review and update of the 2014 regional plan, relative to priority and direction with respect to ecological connectivity;
- build in ecological connectivity as a priority interest and requirement to be addressed where relevant at the local planning level;
- establish an ongoing relationship with the Department of Transportation and Active Transit to identify and address connectivity issues and opportunities associated with highway construction or upgrading;
- identify and delineate opportunities and options to protect, maintain and/or restore 'essential' and 'important' corridors through field study and ground-truthing and in consideration of existing patterns of property ownership and land use;
- coordinate field study, mapping and planning efforts amongst responsible agencies, organizations and/or advocacy groups; and
- identify funding sources and partnerships.

In the absence of focussed effort and action, development will continue to encroach on rapidly narrowing options and opportunities to maintain or restore ecological connectivity between the Chebucto Peninsula and the greater Mainland, and effective foreclosure soon will become the inevitable and ultimate outcome.

References

Brooks, C. (2003). A scalar analysis of landscape connectivity. *Oikos*, *102*(2), 433–439.

Ford, A. T., Sunter, E. J., Fauvelle, C., Bradshaw, J. L., Ford, B., Hutchen, J., Phillipow, N., & Teichman, K. J. (2020). Effective corridor width: linking the spatial ecology of wildlife with land use policy. *European Journal of Wildlife Research*, *66*, 69. https://doi.org/10.1007/s10344-020-01385-y

Halifax Regional Municipality. (2006). *Regional Municipal Planning Strategy*. Halifax Regional Municipality.

Halifax regional Municipality. (2014). *Regional Municipal Planning Strategy. October 2014*. Available: https://www.halifax.ca/sites/default/files/documents/about-the-city/regional-community-planning/RegionalMunicipalPlanningStrategy-20Nov07-Case21162-TOCLinked.pdf

Halifax Regional Municipality, & O2 Planning and Design. (2018). *Halifax Green Network Plan*.

Taylor, P. D., Fahrig, L., Henein, K., & Merriam, G. (1993). Connectivity is a vital element of landscape structure. *Oikos*, *68*(3), 571–573.

APPENDIX I: CHARRETTE PARTICIPANTS

Organizers

Karen Beazley, Chair, Nova Scotia Crown Share Land Legacy Trust
Dale Smith, Trustee, Nova Scotia Crown Share Land Legacy Trust
Mary Ellen Donovan, Friends of Blue Mountain – Birch Cove Lakes Society, Sandy Lake – Sackville River Regional Park Coalition

Technical Organizers

Karen McKendry (Remote Platform Host), Ecology Action Centre
Dave MacKinnon (GIS Resource Person); Chair, Science Advisory Committee, Nova Scotia Crown Share Land Legacy Trust

MC/Host of Charette

Karen Beazley, Chair, Nova Scotia Crown Share Land Legacy Trust; Dalhousie University

Sandy Lake – Blue Mountain Birch Cove Lakes

GIS Resource Person: Caitlin Cunningham, Dalhousie University

Mary Ellen Donovan
Lisa Doucette
David Patriquin
Karen Robinson
Walter Regan
Clarence Stevens

Blue Mountain Birch Cove Lakes – Ingram River

GIS Resource Person: Kermit deGooyer, Nova Scotia Environment – Protected Areas

Emma Kinley
Mike Lancaster
Oliver Maass

Blue Mountain Birch Cove Lakes – Five Bridge Lakes

GIS Resource Person: Pat Nussey, Nature Conservancy of Canada

Rich LaPaix
Chris Miller
Megan Pagniello
Jan Skora
Dale Smith

Five Bridge Lakes – Long Lake Provincial Park and the Backlands

GIS Resource Person: Dave MacKinnon, Nova Scotia Environment – Protected Areas

Kathleen Hall
Martha Leary
Peter Lund
Patricia Manuel
Jillian Meredith

Observers

Kathleen Fralic, Planning and Development, Halifax
Leah Perrin, Planning and Development, Halifax

Summary Report Preparation and Cartography

Caitlin Cunningham

APPENDIX II: GIS LAYERS USED

Nova Scotia Provincial Datasets

CROWN LAND
A spatial dataset of all Crown lands in Nova Scotia. Crown lands are all or any part of the land under the administration and control of the Minister of Lands and Forestry as per the Crown Lands Act. The dataset includes land in which the Nova Scotia Department of Lands and Forestry has full or partial interest. Data download available at: https://data.novascotia.ca/Lands-Forests-and-Wildlife/Crown-Land/3nka-59nz

NOVA SCOTIA FOREST INVENTORY
Layers containing polygons for all lands in the province as described in the Photo Interpretation Specifications. Includes water, forested and non-forested areas with additional identification of freshwater wetlands and coastal habitat area classifications. Data download available at: https://novascotia.ca/natr/forestry/gis/forest-inventory.asp

NOVA SCOTIA PROTECTED AREAS SYSTEM
These lands help preserve Nova Scotia's natural values through a blend of legislation, ownership and management. Included here are: National Parks, National Wildlife Areas, Provincial Wilderness Areas, Provincial Nature Reserves, selected Provincial Parks and selected land trust properties and easements. This combination of federal, provincial and private lands contributes to both provincial and national land conservation and biodiversity goals. Data download available at: https://data.novascotia.ca/Environment-and-Energy/The-Nova-Scotia-Protected-Areas-System/ticv-5du5

NOVA SCOTIA ROAD NETWORK
Nova Scotia Road Network (NSRN) is a digital representation of all the roadways in Nova Scotia. The NSRN has several descriptive attributes to define a roadway such as number of lanes, surface type, and road class. The NSRN is a networked data set complete with linear entities such as roadways as well as point entities such as junctions and blocked passages. The NSRN data conforms to the federal government's National Road Network (NRN) and is regularly uploaded as a contribution to the NRN. Data download available at: https://data.novascotia.ca/Roads-Driving-and-Transport/Nova-Scotia-Road-Network-NSRN-/484g-adjn

NOVA SCOTIA PROPERTY LINES
Dataset that delineates property lines across the province.

NOVA SCOTIA HYDROGRAPHIC NETWORK
The Nova Scotia Hydrographic Network (NSHN) is updated and maintained from aerial photography. Hydrographic features (banks, network linear features, junctions, etc…) are collected and networked into a seamless database. Attribution has been applied to reflect network directionality as well as network priority (main vs. secondary path). Toponyms are included in the attribute table for named hydrographic linear, point and polygon features. Hydrographic feature codes and their descriptions are provided with the download in a NSTDB feature code table. Data download available at: https://nsgi.novascotia.ca/gdd/

Halifax Regional Municipality Datasets

HALIFAX GREEN NETWORK PLAN

TheHalifaxGreenNetworkPlanwasadoptedbyHalifaxRegionalCouncilonAugust14,2018.Theunderlying datatosupportthemapsintheplandocumenthavebeenreleasedthroughopendata.Pleasevisithttps://www.halifax.ca/about-halifax/regional-community-planning/community-plans/halifax-green-network-planforcompleteinformation Data download available at: https://www.halifax.ca/home/open-data/open-data-files#HGNP

HRM PARKS
Polygon representation of HRM owned and maintained parks. Includes areas that have been developed as parks and land with the primary function of providing active and/or passive recreation opportunities. Data download available at: https://catalogue-hrm.opendata.arcgis.com/datasets/3df29a3d088a42d890f11d027ea1c0be_0?geometry=-68.390%2C44.111%2C-57.937%2C45.475