HALIFAX
GREEN NETWORK

State of the Landscape Report

DRAFT

Prepared for Halifax Regional Municipality

October | 2015

HALIFAX

Prepared for

Halifax Regional Municipality

Prepared by

O2

In collaboration with

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Executive Summary

The importance of open space for the economic, social, and environmental health of the Halifax Regional Municipality (HRM) is recognized in the 2014 Regional Municipal Planning Strategy (the Regional Plan), which calls for a Greenbelting and Public Open Space Priorities Plan for the region.

The “priorities plan”, renamed the Halifax Green Network Plan (HGNP), will establish a planning and land management framework for open space to help advance the multiple environmental, social, cultural, and economic objectives of the HRM, as well as a means to inform future development and growth patterns. The following State of the Landscape Report: Issues and Opportunities (the report) is an initial step in the development of the HGNP. The report provides a summary of the current state of the open space system and an overview of the key issues and opportunities that will influence and guide the plan’s development. This report also provides baseline information to be compared with the performance indicators of alternative open space scenarios as the HGNP evolves.

Few areas in the world offer the diverse landscape found in the HRM, including its exceptional natural coastal and inland open space areas. Managing the landscape in an integrated and sustainable manner is critical to the future growth and livability of the region, and requires a coordinated understanding of the context of open space function and ownership across jurisdictions and land ownership. The HGNP will provide an important framework for identifying and categorizing the landscapes that need to be conserved and managed over the long-term.

Public and Stakeholder Engagement

The HGNP will engage public and stakeholders throughout the development of the plan. The first phase of engagement, Phase 1 - Foundations, sought input on open space values, issues, and goals to help inform the report. Five core open space themes were used to frame the discussion throughout the engagement process: ecosystems and biodiversity, working landscapes, recreation and trails, communities, and cultural landscapes. The report is organized around these five themes.

Open Space Themes

Public and stakeholder input was used to develop a high level value statement for each of the five themes. These value statements represent which open space functions, attributes and/or benefits are important to Halifax citizens. This input will inform the development of performance indicators to evaluate and refine alternative open space scenarios and options during the second phase of the HGNP (Phase 2 - Planning Framework). The following table presents the open space themes and values:

ECOSYSTEMS + BIODIVERSITY

NATURAL SYSTEMS THAT SUPPORT PLANT AND ANIMAL LIFE.

VALUE STATEMENT Diverse and healthy ecosystems provide a series of important ecosystem services and benefits, such as provisioning (water, food, and fiber), regulating (climate and water), and supporting natural and built environments (habitats, water quality).

CULTURAL LANDSCAPES

PLACES THAT CONNECT US TO OUR HISTORY AND DEFINE OUR REGIONAL IDENTITY.

VALUE STATEMENT Cultural landscapes, including their historical context and land uses, are the foundations for the communities' sense of place and identity.

RECREATION + TRAILS

PLACES WE GO FOR FUN AND FACILITIES WE USE TO MOVE AROUND.

VALUE STATEMENT Connected parks, wilderness areas, and trails provide a wide range of recreational and active transportation opportunities within reach of communities, which can help promote active lifestyles, contribute to quality of life, and stimulate economic investment.

COMMUNITIES

PLACES WE LIVE AND WORK, AND PLAY CLOSE TO HOME.

VALUE STATEMENT Parks and open spaces contribute to the unique sense of place, as well as help shape community identity and community form. Strategic open space protection helps to ensure that growth management objectives are achieved through sustainable development patterns. Accessible urban open spaces are connected by foot, bicycle, and transit, and promote an active lifestyle, as well as contribute to the overall quality of life.

WORKING LANDSCAPES

PLACES THAT SUPPORT THE ECONOMY.

VALUE STATEMENT Working landscapes provide important economic development opportunities, while ensuring the viability of ecosystems in the long-term. The preservation of traditional land-uses, food security and the viability of rural communities all strongly depend on a thriving working landscape.

Open Space Assessment

The HRM is an area of outstanding ecological and cultural quality and, as Nova Scotia's capital, plays a vital role in the province's economy. Section 2 of the Report outlines the biophysical, economic, socio-cultural, and historical contexts of the region. Since the HRM comprises both public and private lands across a number of jurisdictions, multiple governmental parties are involved in the management of land and water. Section 2 provides a review of the current policy and land management context to provide an understanding of federal and provincial governmental policies, plans, and regulations that directly affect and constrain what the HRM could do within its boundaries and how its open space is managed. Section 3 presents the open space assessment for each of the five core themes and includes a set of identified issues and opportunities for each theme.

The open space assessment integrates public and stakeholder input, with government data sets and existing policy direction, supplemented with spatial analyses using GIS. During the course of the public and stakeholder engagement, preliminary issues and opportunities were identified. These helped direct the spatial analyses, which in turn, refined the set of issues and opportunities.

The open space assessment presents the key issues and opportunities, followed by a general discussion of the sub-themes. The following table presents a summary of key findings for each of the themes:

Summary of Key Findings

ECOSYSTEMS + BIODIVERSITY

1 Water-quality is negatively impacted by increased development that compromises source water protection areas and watersheds, which are facing extensive run-off and contamination issues. The shallow depth to groundwater makes contamination of wells a major issue in many areas, particularly those served by dug wells.

2 **Landscape connectivity** and **habitat loss** including extensive fragmentation surrounding urban areas, are increasing concerns. Critical areas are vulnerable to expanding residential development, natural resource extraction, and utility/transportation corridor expansions. Areas in the Chebucto Peninsula will imminently be completely cut off from the broader regional landscape by roads and other development.

3 Coastal areas are of high value ecologically, socially, culturally, and economically, but are not adequately recognized through current planning and land management practices. Productive estuaries are of particular concern.

4 Much of the available **biodiversity data** is opportunistically and locally collected, a thorough survey and inventory of the broader region is called for.

WORKING LANDSCAPES

5 **Mining and aggregate extraction** are important economic activities but are threatened by encroaching development, competing land uses, and protected area designations.

6. The majority of **forested lands** are privately owned, making consistent sustainable management and coordination of objectives a challenge.

7. The local food system is threatened by the loss of an already limited supply of **agricultural lands,** as well as the impact of climate change.

8. Critical **industrial landscapes** are challenged by land-use conflicts and conservation objectives, particularly near urban areas. Greater attention to locating and developing industrial landscapes in an ecologically sensitive and at a broader landscape scale is needed to ensure the long-term viability of industrial activities and the regional economy.

9 **Tourism** is critical to the viability of rural communities, but potential conflicts with other activities, such as forestry or settlement, can have a negative impact. Beyond individual sites and opportunities, tourism requires a high quality, broader landscape context. Ribbon development along scenic travelways is having a negative and serious effect on the scenic quality of the region.

10 **Wild harvesting areas** including hunting and fishing, need to be sustainably managed for habitat production, and public use and access.

RECREATION + TRAILS

11. HRM has a good supply of **regional and wilderness parks** within, and in close proximity to settlement areas. However, access to parks, water (inland and coastal), and amenities, as well as connectivity to and between open spaces are serious issues.

12. **Water access** to both coastal areas and inland waters is limited in many parts of the HRM. While many areas are publically owned, access is limited and fragmented by private property.

13. The HRM has a wide variety of **trails and AT routes**, but lacks a comprehensive corridor system that is connected, accessible, and diverse. There is an incomplete mapping of trails, including many unofficial trails, which challenges planning and prioritization.

COMMUNITIES

14. **Natural edges** of communities and the access to green space edges contribute to community identity and sustainable growth patterns, but they are threatened by inefficient development and leap-frog development; "sprawl."

15. Broader open space objectives need to be considered in the design of parks in individual developments in order to maximize the benefits of the entire open space system.

16. **Urban forests** across many areas will require extensive maintenance and replanting efforts in the near future. Substantial tree removal in certain suburban and waterfront developments is an issue.

17. The amount, quality, and/or location of **park space** in some communities creates areas where open space is either not sufficient or is underutilized. This is particularly true in more recent developed communities.

18. The open space function of **streets** is underutilized throughout the urban areas. Greater use of the street right-of-ways for stormwater management and as an urban amenity is needed.

19. HRM lacks a detailed **park system plan** to inform the potential reconfiguration, acquisition, and/or removal of open space at strategic locations.

CULTURAL LANDSCAPES

20. Cultural landscape **information and program** focus is lacking. Planning and program development is at a very early stage, both at the municipal and provincial level.

21. The identification and management of significant cultural landscapes is vital to the HRM's sense of place and long-term prosperity.

22. The lack of **mapped data** on the pre- and post-European contact landscapes of **indigenous peoples** is an issue. It limits the identification of the complete range of potential culturally significant landscapes.

23. In order for cultural landscapes to be identified and categorized for their potential significance, the HRM must develop a **criteria-based framework** founded on regional thematic elements (including sites of worship, indigenous use, ethnic settlement and resettlement, military use, transportation, urban landscape, natural resource use, natural features, and regulated heritage sites).

24. The citizens of the HRM are key stakeholders in the identification of landscapes of cultural significance to the communities in which they live and work. Their **ongoing engagement** is vital to identifying these landscapes and to determining the future of these unique resources.

25. The threat of **inappropriate development** to the landscape and sense of place in the HRM's coastal villages, waterways, coastlines, and much-loved scenic views is a concern that communities have identified as an important issue that needs to be managed. Similar threats to traditional hunting and gathering areas exist and need to be addressed.

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Introduction

As an overview analysis and summary of the current state of the Halifax region and its open space system, the Report is the first step in the process of developing the HGNP and sets the foundation for further developing the planning and implementation framework. In addition to the community engagement process, the Report summarizes existing open spaces in Halifax, what the region most values, and which open space components the region's residents care about and want to maintain in the future.

By examining five Open Space Themes: Ecosystems, Working Landscapes, Communities, Recreation and Trails, and Cultural Landscapes, the Report identifies open space elements and systems in the Halifax region that will form key components of the HGNP and the larger open space network. The Report provides an overview of the biophysical, social, economic, historical and planning contexts, as well as the key values, issues and opportunities the HGNP should consider with respect to these five open space themes.

1.1. PURPOSE AND SCOPE OF THE GREEN NETWORK PLAN

The Regional Plan provides the policy foundation for the development of the HGNP and identifies it as a "priorities plan". The HGNP is intended to determine an economically and environmentally sustainable strategy for the maintenance and distribution of parks and other open spaces throughout the HRM. It will set forth a decision-making framework to guide open space priorities for the region that will advance the Regional Plan's objectives and policy directions. As a higher level document, the HGNP will provide broad policy for the region that can shape further studies and changes in planning practice and other municipal initiatives across the HRM. Although it will inform changes to the Land Use Bylaw (LUB) and other planning documents, it will not provide direct LUB amendments or address detailed site and development policies. Furthermore, as the HGNP addresses both publicly and privately owned lands, the HGNP can provide a foundation and strategy to guide the development of partnerships and collaborations between levels of government, institutions, individuals, stewardship groups, and non-profit groups. To this end, the HGNP will establish a planning and land management framework for open space to help advance the multiple environmental, social, cultural, and economic objectives of the HRM, as well as a means to inform future development and growth patterns.

The HGNP will address the key benefits of open spaces, including:

- maintenance of healthy lakes, streams and wetlands;
- conservation of biodiversity, important ecosystems, and habitats;
- effective stormwater management and flood protection;
- stewardship of environmentally sensitive lands and waters;
- conservation of natural resources to support farming, fishing, forestry, and mining;
- access to nature and recreational spaces;
- connecting communities and landscapes;
- protection of cultural resources and sense of place;
- access to coastal areas and recreational landscapes; and
- guidance for sustainable development and growth.

1.2. PURPOSE AND SCOPE OF THE STATE OF THE LANDSCAPE REPORT

The primary purpose of the State of the Landscape Report is to identify the key issues and opportunities that will influence and guide the development of the HGNP. As an overview analysis and summary of the current state of the Halifax region and its open space system, the Report is the first step in the process of developing the HGNP and sets the foundation for further developing the planning and implementation framework. In addition to the community engagement process, the Report summarizes existing open spaces in Halifax, what the region most values, and which open space components the region's residents care about and want to maintain in the future. By examining five Open Space Themes: Ecosystems, Working Landscapes, Communities, Recreation and Trails, and Cultural Landscapes, the Report identifies open space elements and systems in the Halifax region that will form key components of the HGNP and the larger open space network. The Report provides an overview of the biophysical, social, economic, historical and planning contexts, as well as the key values, issues and opportunities the HGNP should consider with respect to these five open space themes.

1.3. OPEN SPACE THEMES

Five core open space themes were used to frame the discussion throughout the engagement process and the landscape analysis in the Report, and will continue to act as a framework in the development of the HGNP. The five themes are listed in Table 1.

Table 1. Open Space Themes

1.4. PUBLIC AND STAKEHOLDER ENGAGEMENT OVERVIEW

Effective public engagement provides opportunities for participation that are both meaningful to the public and support project outcomes. The Report incorporates the results of Phase 1 of the engagement process (conducted from May to July 2015 and summarized in the What We Heard Report Phase 1 – Foundations), which was intended to lay the foundations for continued engagement throughout the development of the HGNP. The first phase of engagement sought input from stakeholders and the public on open space values, issues, and opportunities. The engagement consisted of the following events, and involved roughly 560 participants:

- Two (2) open houses
- Ten (10) pop-up events
- Two (2) stakeholder workshops focused on the cultural landscape
- Three (3) stakeholder workshops
- One (1) government workshop and two (2) meetings
- Six (6) stakeholder meetings

Other engagement activities included:

- An online mapping tool
- Surveys: online and in-person

Public and stakeholder input was used to inform this Report and to develop high level value statements for each of the five themes. These value statements represent open space functions, attributes, and/or benefits that are important to Halifax residents. They will directly inform the development of performance indicators to evaluate and refine alternative open space scenarios and options during Phase 2 of the engagement process (Planning Framework).

1.5 DATA ACQUISITION

Data was widely solicited from provincial and municipal bodies as well as from interested stakeholders. The bulk of the data used in this report was provided by the HRM, and was supplemented by publicly available data from the province and notable federal and privately maintained datasets.

2

Planning Context

The Halifax Regional Municipality is an area of outstanding ecological and cultural quality. There are few other places in the world with such exceptional natural coastal and inland landscapes offering a diversity of urban to near wilderness lifestyle opportunities. The following sections outline the biophysical, economic, socio-cultural and historical contexts of the region, together with an overview of the policy and land management environment.

2.1 BIOPHYSICAL CONTEXT

The Halifax Regional Municipality includes a broad range of land cover types, with extensive urban development in and around the City of Halifax, giving way to expanding suburban and exurban residential areas, farms, and forest. The region has substantial areas of undeveloped lands covered by large patches of Acadian forest, interspersed with wetlands and rock barrens. The underlying physical geography together with historical natural disturbances including major storm events, have created a mosaic of varying cover types and age classes. Remnants of old growth forest are found in isolated stands throughout the area. An extensive network of rivers, streams and lakes is found in the region, and most areas are within a short distance of riparian vegetation (Map 1 details the broad land cover types found throughout the region).

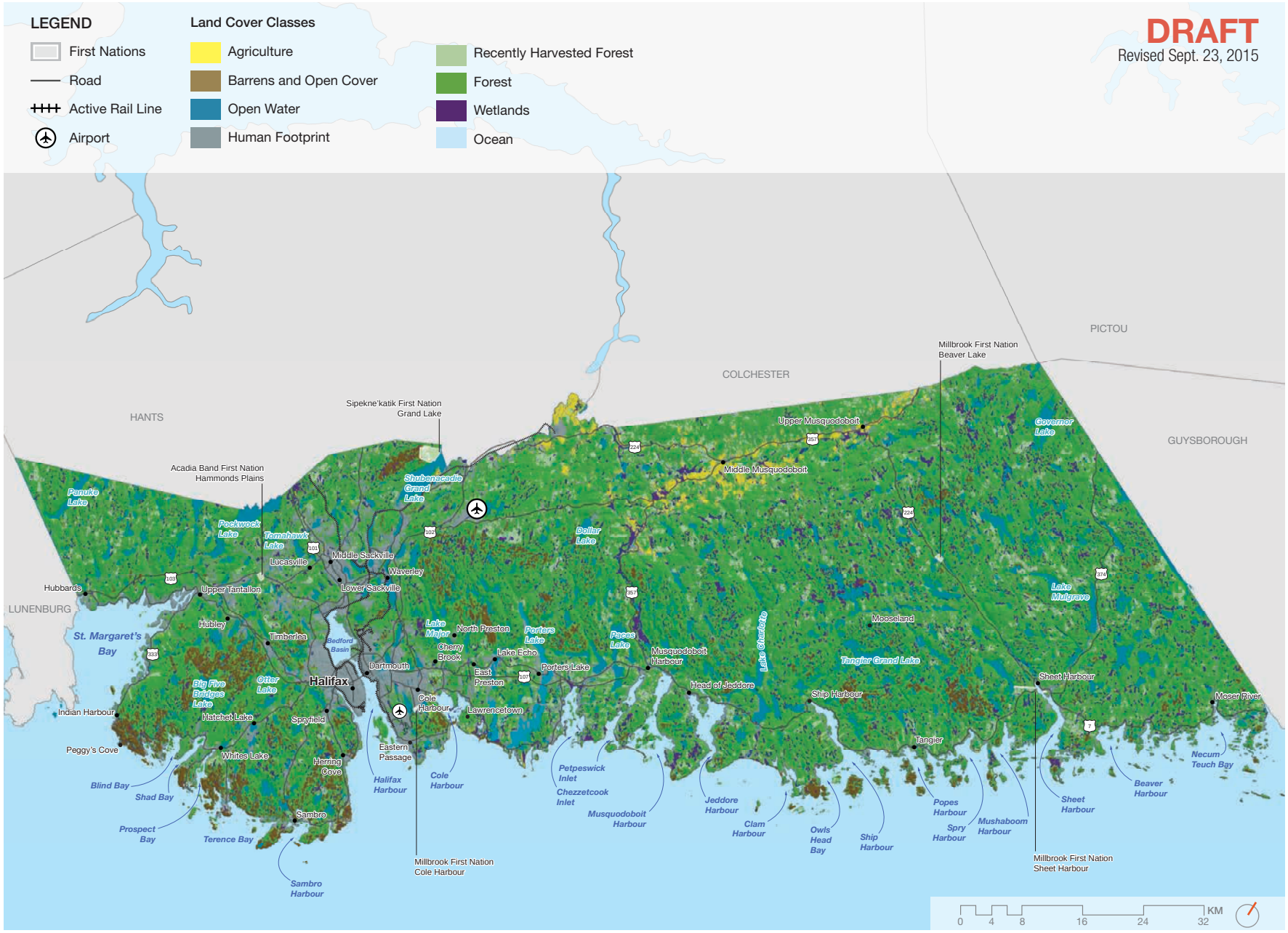
Groundwater is typically found within a short depth of the surface, making groundwater contamination a concern for dug wells. The chemistry of the underlying pyritic slate bedrock also contributes to groundwater quality issues throughout the region with iron, manganese and, in places, arsenic, being a problem for deeper drilled wells that are less susceptible to contamination from the surface.

Most of the region has underlying soils of low productivity. The exception is the Musquodoboit Valley, consisting of soils appropriate for arable agriculture, and having the majority of farms in the region. The low productivity of the soils also restricts the productive forest land base and limits the amount of commercial logging and small scale private woodlots found throughout the region.

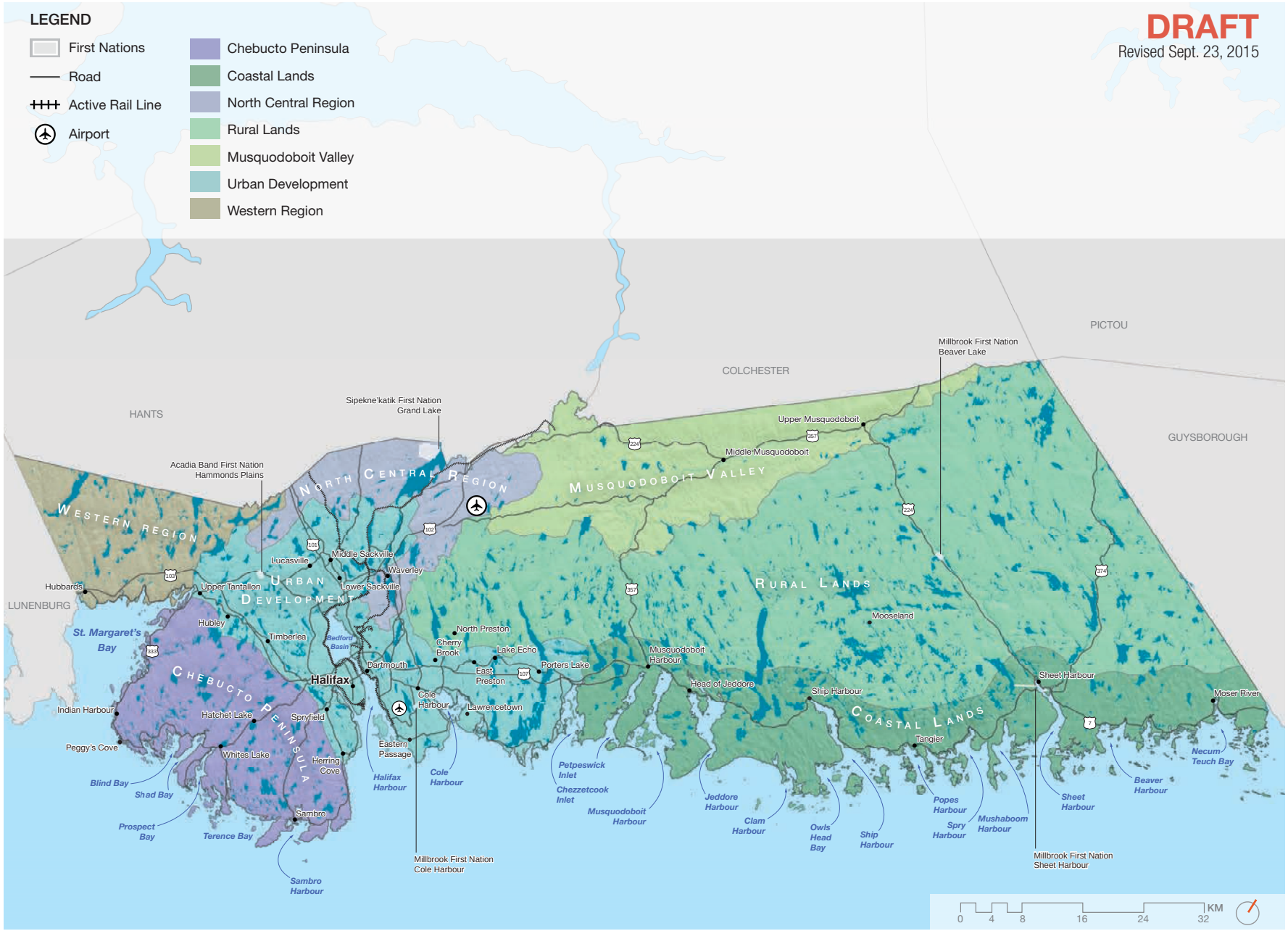
The extensive coastline provides many important and unique habitats, producing a highly diverse set of local upland and lowland ecosystems. However, habitat degradation, due to over-use of sensitive coastal areas, is an ongoing concern, putting areas such as coastal wetlands and marshes that provide storm-buffering benefits at risk. Land-water interactions also affect the health of near shore aquatic ecosystems. Climate change and associated sea level rise provide additional challenges in terms of increased erosion, storm inundation and damage to coastal infrastructure. Maintaining ecosystem integrity is a primary management objective of the Regional Plan, while also ensuring public access and enjoyment of the natural setting.

A broad set of seven landscape units can be defined, which capture the overall distribution of land cover and human development throughout the region (Map 2). Each unit represents a broadly similar set of planning conditions, which require specific management approaches.

Map 1. Land Cover



Map 2. Landscape Units



2.2 HISTORICAL CONTEXT AND THE EVOLUTION OF THE HRM

The complex history of the lands that today comprise the HRM begins with displacements of its indigenous peoples, European settlement by choice or military force, later expulsions and re-settlements, on-going European immigrations and colonizations, and subsequently membership into the Canadian confederation. HRM lands were initially occupied exclusively by indigenous peoples from the end of the last glaciation, approximately 10,000 years ago. Although some historians infer a limited European contact by sea prior to the 17th century, the Acadians may rightly be considered to have been the first significant contact the indigenous peoples of the region had with European colonists. The British first established a military presence, at what was to become present day Halifax, in 1750. Subsequently, during the Seven Years War and the related "Indian" Wars, the British deported the Acadians, who had had good reciprocal relations with the Mi'kmaq during the Great Expulsion of 1755 - 1764. The Acadians returned in limited numbers after the British Conquest and, together with French Protestants of later immigrations, made a substantial imprint on the land that is still legible in this century. In turn, the United Empire Loyalists of English-American and African descent, the Maroons from the Caribbean, the Germans, and the immigrants from across the British Isles brought their distinctive cultures that to this day influence the lands and unique geography of the HRM.

Maps 3 to 13 were selected as representative of distinct development eras, beginning with the British establishment of a military compound and the survey of a future townsite on the south shore of Halifax harbour. These representative maps span the period between 1750 and 2010. They have been edited, and in some cases annotated, to indicate the displacement of the Mi'kmaq peoples, the evolution of colonial settlement, and the subsequent consolidation and confederation with Canada up to the present day and into the future development of the HRM lands. As such, these maps also provide key indicators to identify future potential open space networks and to protect landscapes of cultural significance. They provide, in part a historical framework for the ongoing identification and preliminary analysis of specific areas of significance throughout the term of the HGNP.

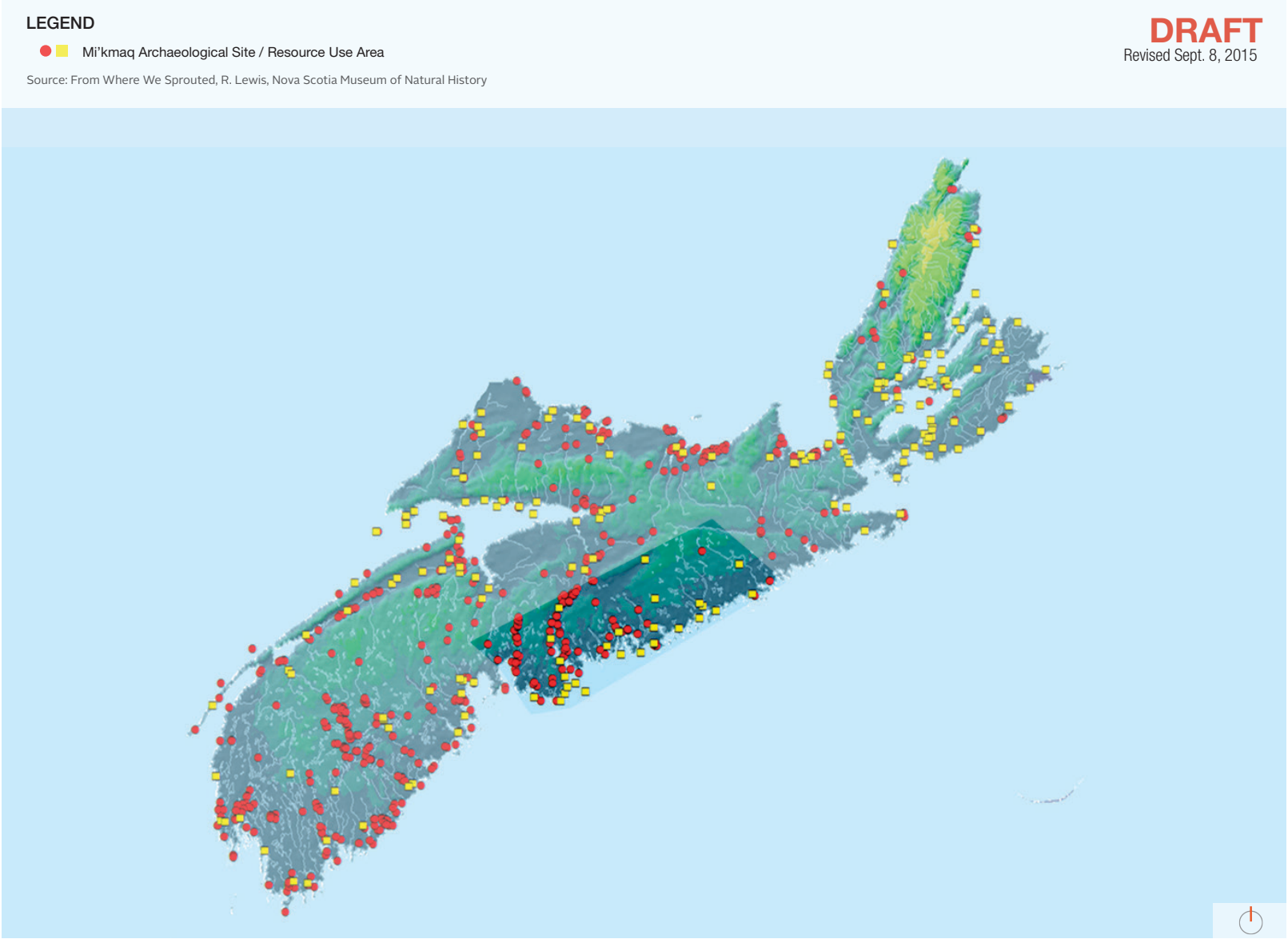
The series of historical maps (Map 3 to Map 13) outline, in graphic form, the impacts of settlement on the region. Belcher's Map of 1834 has been annotated with the historic Mi'kmaq place names of areas of traditional use and occupancy. The place names were derived from the Mikmaw Place Names Digital Atlas and website at: www.mikmawplacenames.com. The following maps trace the extension of surveys that established sequential patterns of development across the region. Map 13 highlights, in graphic form, the increasing pressures on-going development has placed on rural landscapes and their associated hydrology in the HRM. These pressures will be analyzed and measures proposed and discussed to address both the conservation of landscapes of cultural significance and the need for open space linkages throughout the region during the HGNP process.

The following maps are included:

TRADITIONAL USE, THE MI'KMAQ AND COLONIZATION*

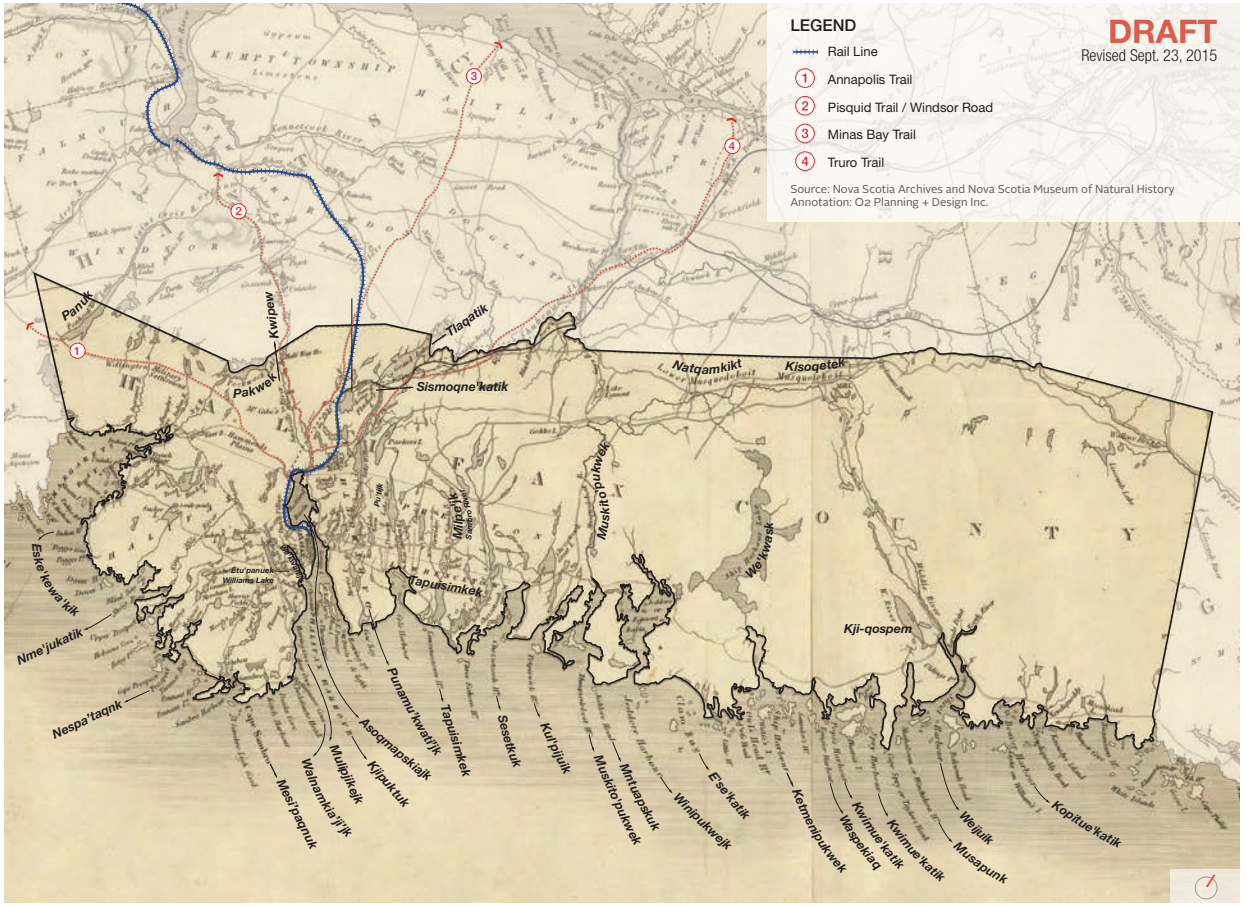
(*Key data is missing and will be the subject of ongoing discussions with the HRM Parks and Planning Unit.)

Map 3. Mi'kmaq Archaeological Sites and Resource Use Areas



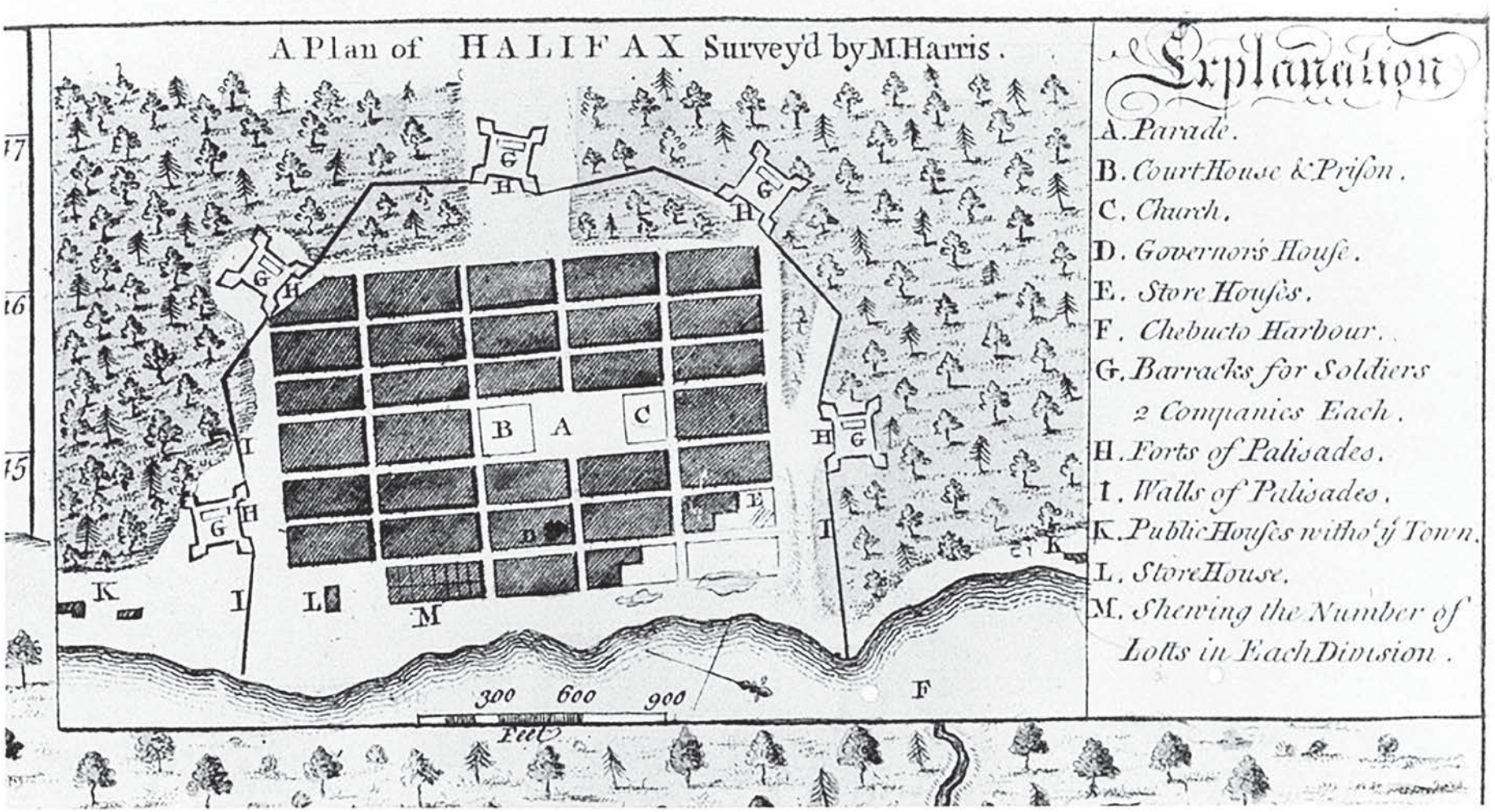
Map 4. Belcher's Map Nova Scotia, 1834 Annotated

The annotations highlight the traditional areas of Mi'kmaq land use and occupancy to 1834. The dataset of Mi'kmaq Place Names was provided by the Nova Scotia Museum of Natural History courtesy of Roger Lewis. Major trails whose origin derived from Mi'kmaq and Acadian traditional routes are indicated, many of which, or portions of them, were later developed as major roads linking the region.



Map 5. A Plan of Halifax Surveyed by M. Harris – 1750

This map outlines the extent of the original British Military survey of the future town site of Halifax.



Source: Nova Scotia Museum of Natural History

Map 6. Blascowitz Plan of Halifax – 1784

The overlay on the Plan of Halifax, 1784 indicates the growth of settlement along the inner harbour during the period 1750 - 1784.

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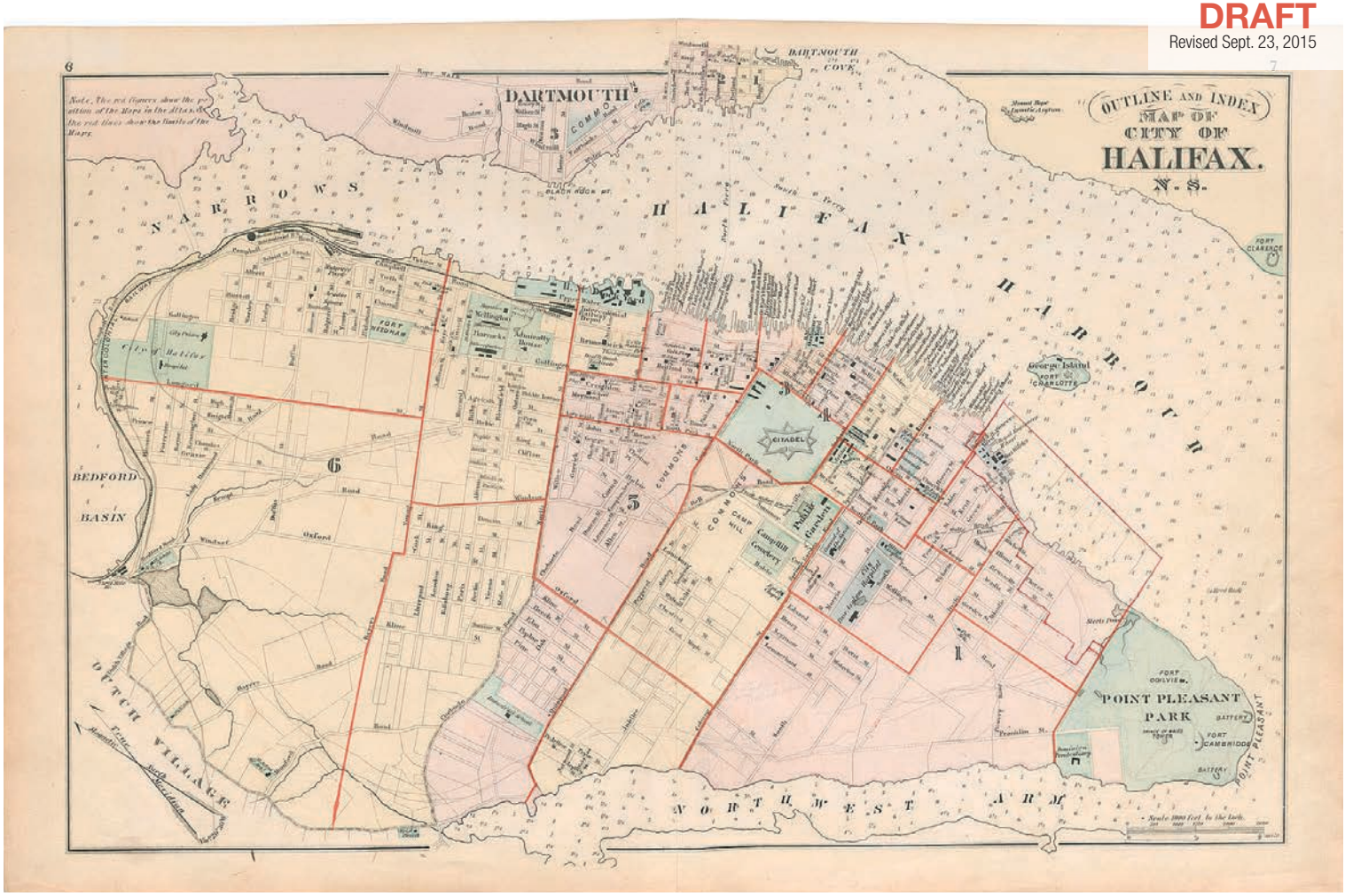
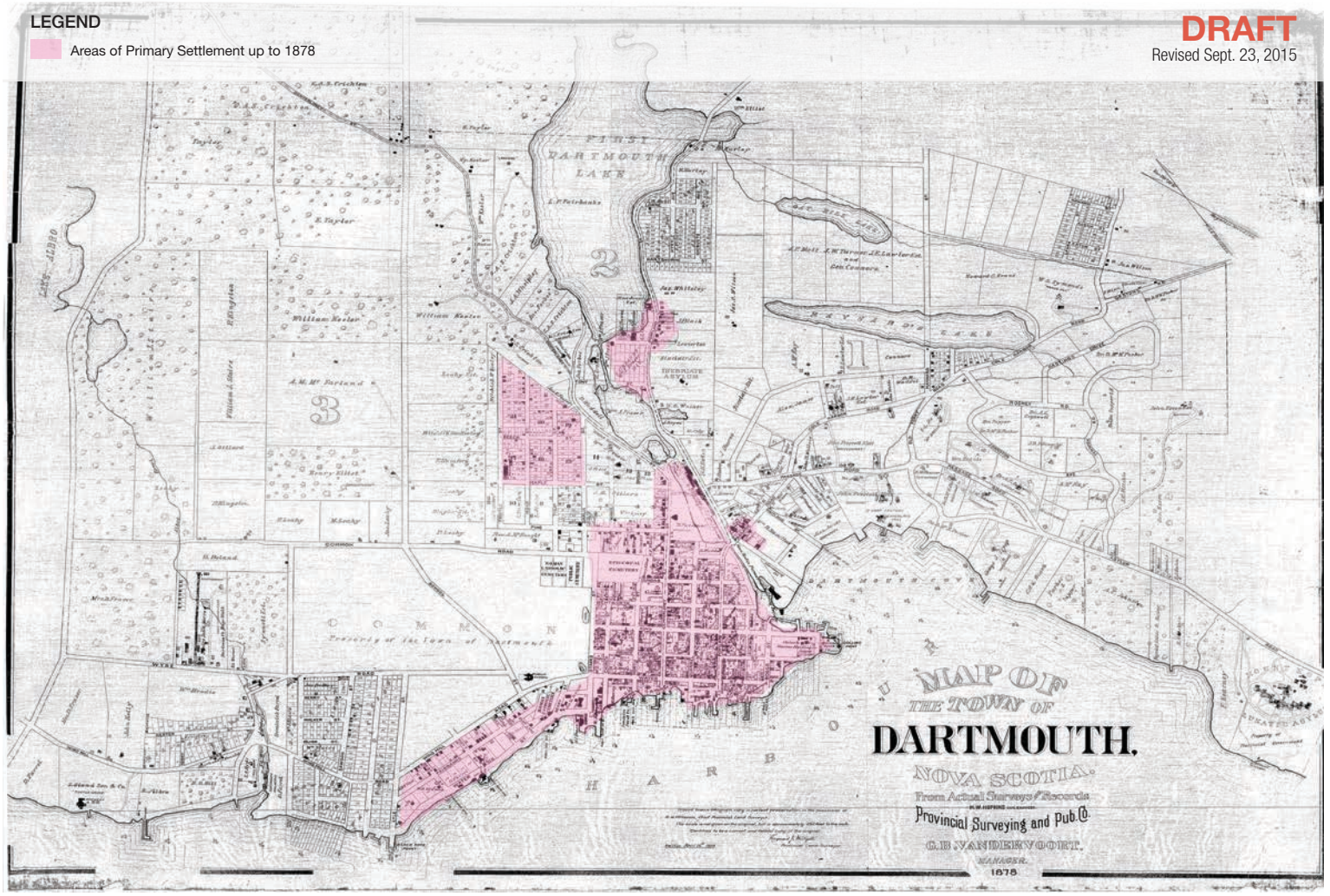
Map 7. City of Halifax 1878, H. W. Hopkins

Hopkins map of the City of Halifax outlines the expansion that took place in the pre-Confederation era and the anticipation of future growth in the post Confederation era. It is notable that the Town of Dartmouth has been included with the implication of its increasing economic relationship with the City of Halifax and its importance within the Halifax region.



Map 8. Town of Dartmouth 1878, H. W. Hopkins

The overlay indicates the areas of primary settlement in the Town of Dartmouth and the extension of surveyed lands into the predominantly rural areas surrounding the town site that prefigures the growth to come in the next century.



Map 9. Halifax NW 1918, Surveyed Pre – 1917 Explosion

The overlay outlines the extent of the area devastated by the explosion of 1917, a portion of which, the Hydrostone District, was subsequently redeveloped on a modified English Town Planning model with lanes.

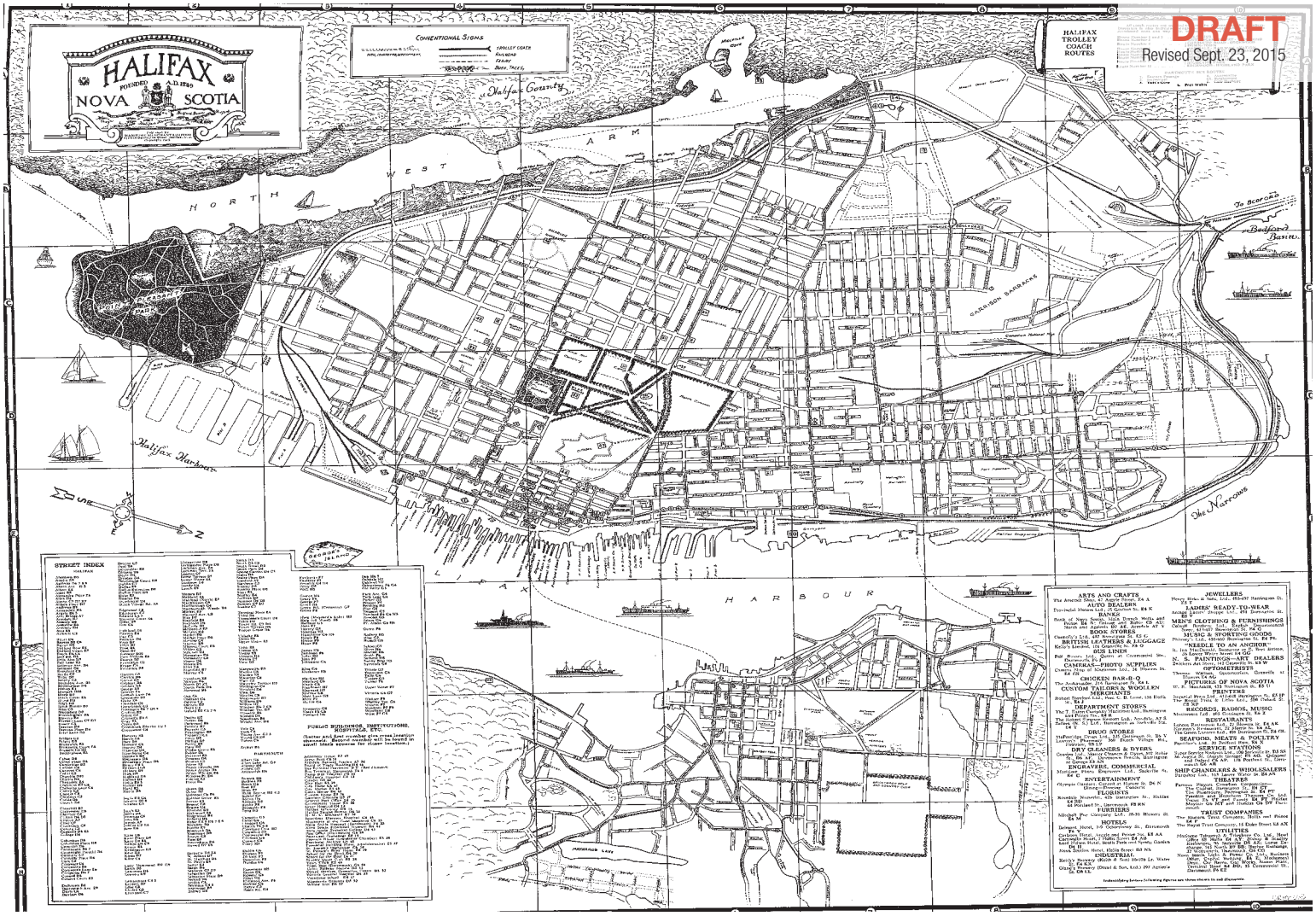
LEGEND

- Explosion Damage Area
- Explosion Site
- Sites Used To Deal With the Aftermath of the Explosion

Source: Canada Department of Militia and Defence, Nova Scotia Archives
Annotated: O2 Planning + Design Inc.

Map 10. City of Halifax with Town of Dartmouth 1949

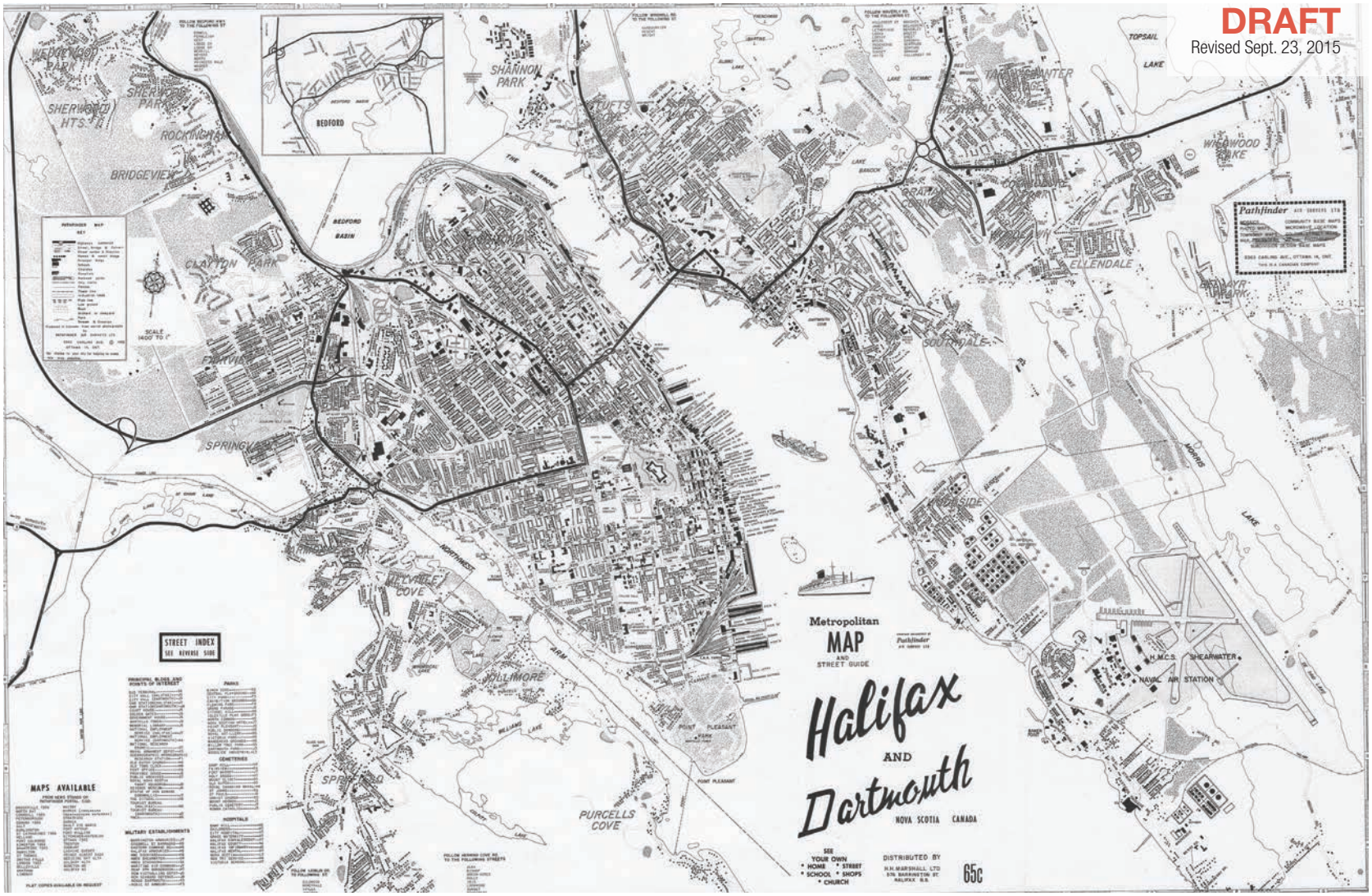
The map outlines the scale of development in the immediate postwar period prior to the subsequent construction of the two bridges and the subsequent expansion into the greater region.



Source: Canada Department of Militia and Defence, Nova Scotia Archives

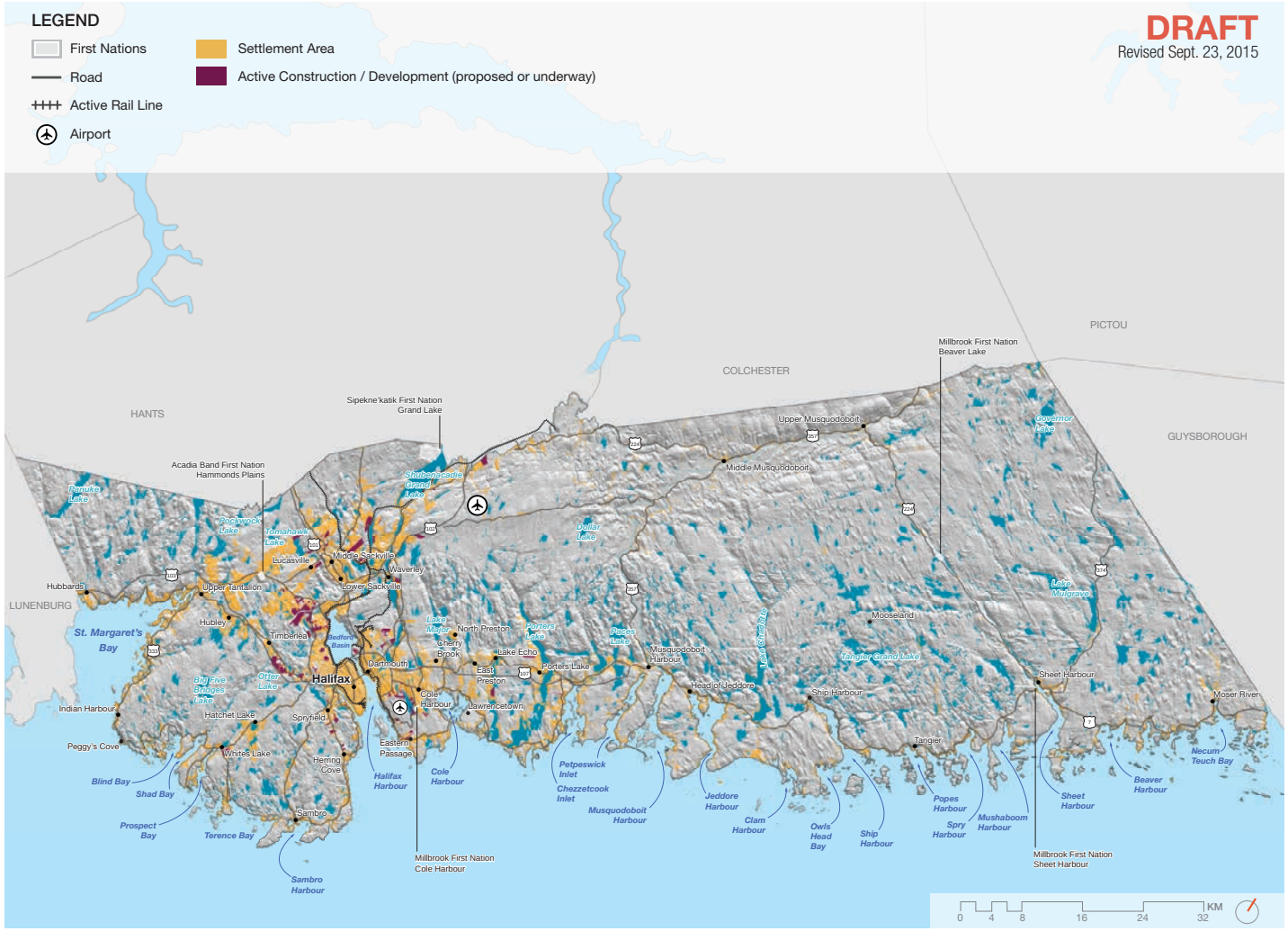
Map 11. Metropolitan Halifax and Dartmouth 1965

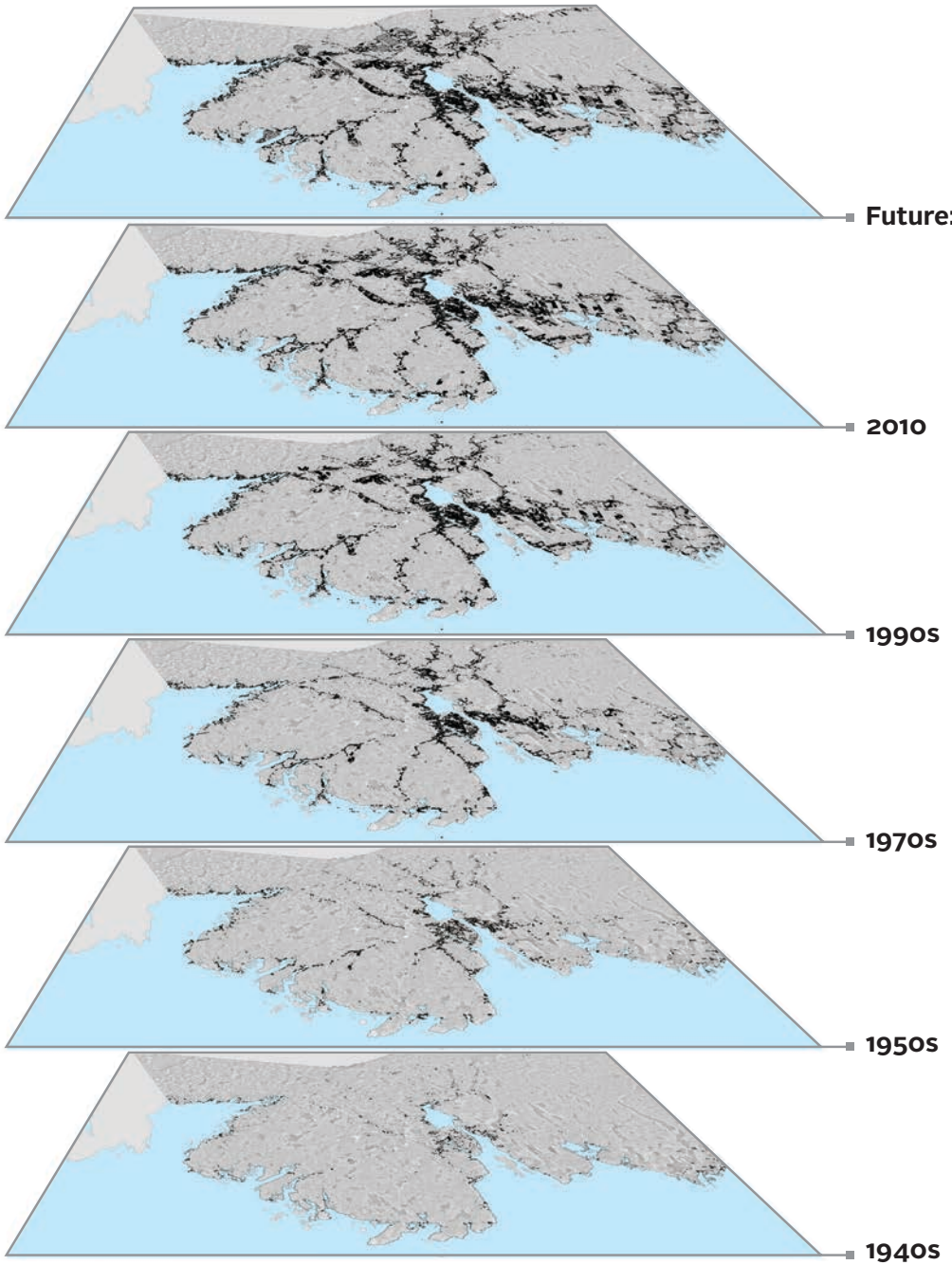
This detailed map outlines the rapid expansion of Halifax and Dartmouth into the surrounding region and the amalgamation of outlier communities, which were enabled by the construction of bridges.



Map 12. Halifax Regional Municipality Present Development Conditions

This map outlines the present extent of development in the Halifax area further enabled throughout the entire HRM by the construction of the Macdonald Bridge in 1955. Importantly, it includes areas under Development Agreements that indicate the projected extent of future growth. These future growth areas have significant implications for open space linkages in the HRM.

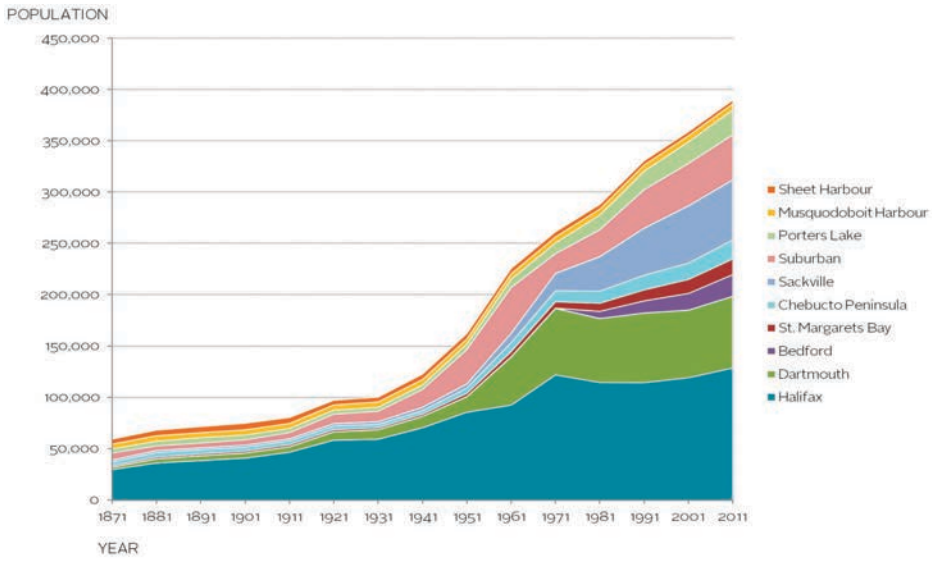




Map 13. Development Progression 1950 to 2010 Including Approved Development Lands, NTS

The map graphically indicates the rate, direction, and extent of growth within the HRM. When cross referenced with Map 10, it highlights the scale of development and opening up of the region that is directly attributable to the construction of the harbour bridges.

Figure 1. Cumulative population for the HRM by census subdivision, 1871 to 2011. (Stantec Consulting Ltd. 2013)



2.3 DEMOGRAPHIC CONTEXT

Representing 10% of the total land area of Nova Scotia, the HRM comprises 44% of the province's population. It has a population that is significantly younger than the province as a whole (14% of the population of the HRM is 65 and over, compared to 22% of the province), and is continuing to see most of its immigration in the 15 to 24 age cohort, predominately university students (Morley 2015).

With steady population growth over the past 25 years in the HRM, the region reached a population of 414,398 in 2014 (refer to Figure 1 for the HRM's cumulative population growth from 1871 to 2011 by census subdivision). The 1.1% growth rate from 2013 to 2014 puts the HRM in line with the national average growth rate (Morley 2015). Projections from the Regional Municipal Planning Strategy forecast the addition of approximately 73,115 persons in the HRM from 2011 to 2031 (Halifax Regional Municipality 2014). The bulk of this growth (roughly two thirds) is expected to be international immigrants, making the HRM's population increasingly diverse. Aboriginals and African Nova Scotians are the fastest growing communities in the region (Halifax Regional Municipality 2014).

This increasingly diverse population growth will require additional development and public amenities. As is evident in Figure 1, the bulk of growth in the past in the HRM has occurred outside of the Regional Centre, which can place development pressure on existing open spaces, and subsequently increase the intensity of their use, creating a demand for additional, and potentially, different types of open space. However, recent trends and goals by the HRM in the Regional Plan indicate that the Regional Centre will absorb a substantial amount of new growth in the HRM; 75% of new housing units within the Regional Centre and urban communities. The Regional Centre Plan, which will be under development over the next year (2015 to 2016), will at a broad level determine how growth is accommodated in the Regional Centre, but will also have implications for the rest of the HRM as well. Coordination with this work will significantly aid the development of a comprehensive and cohesive open space network that can be successfully integrated with new development.

2.4 ECONOMIC CONTEXT

In 2014, the HRM's GDP, boosted by the first full year of natural gas production at the Deep Panuke project, grew by 2.6%, which was second only to Regina, of the HRM identified benchmark cities (Morley 2015). Over the past five years, the unemployment rate has held relatively steady between 6.1 to 6.5%, lower than the national average. Trade, the largest employment sector in the HRM (refer to Figure 2.), is a reflection of the Regional Centre's large natural port.

The greatest influence on the HRM's economy is its port and associated facilities and services. The strategic location of Halifax Harbour, as the first inbound and last outbound major port of call north of the major shipping route between western Europe and the Eastern Seaboard, is critical to the port's continued importance as a major economic driver of the Regional and Provincial economies. Rail connections to western Canada, the United States, and the Halifax Port Authority's container terminals and cargo piers, add to the port's importance.

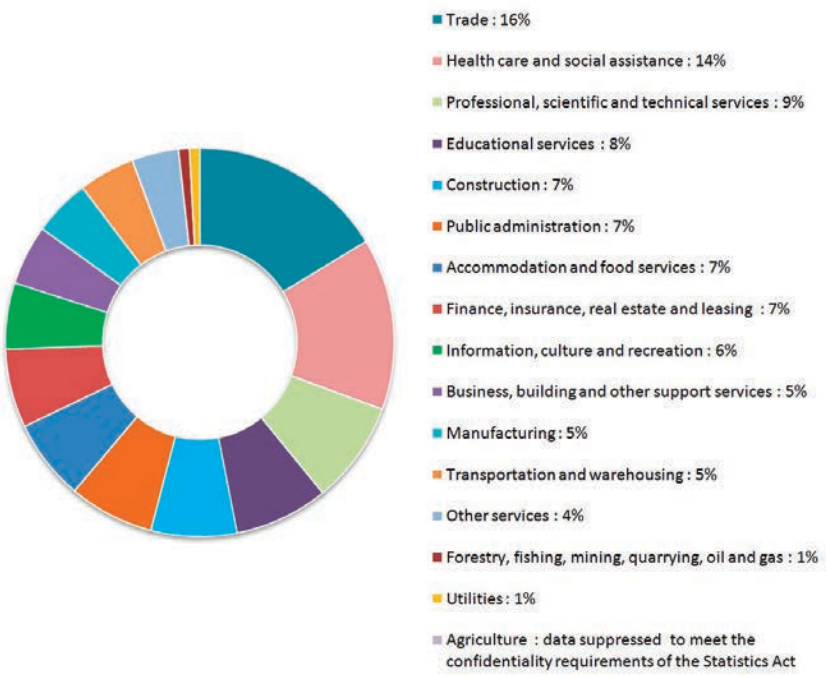
Local shipyards are involved in many large ship building contracts and are a major employer in the region. The Department of Defence and Coast Guard stations, as well as the Bedford Institute of Oceanography also contribute to the economic activity of the harbour. Cruise ships regularly dock at the Port at a major new passenger terminal on Piers 20 and 22. The Canadian National Railway maintains extensive facilities around the waterfront. The deep water port of Sheet Harbour serves a major role in the offshore and forestry industry in eastern Nova Scotia. Access to the shoreline for working harbour activities is, therefore, critically important to maintain.

Agriculture, and the major resource industries of mining, forestry, and energy extraction, support the economy in rural areas of the HRM. The Musquodoboit Valley is the main agriculture area and fishing harbours are located along all coastal areas. Forestry is most common in the Musquodoboit Valley and Eastern Shore areas where there are 21 sawmills. Clay, shale, gold, limestone, and gypsum extraction are also found in rural areas.

Two other significant factors in the region's economy are: tourism, with the highest rates in coastal areas, and government activities. As Nova Scotia's capital, the HRM attracts a large, and growing, number of administrative and professional service employees. Investments in research, development and innovation, as identified in the Halifax Index 2015, and led by the economic sector in Halifax, are also a key driver of economic growth and opportunity. The HRM efforts to further collaborate between universities, the private sector, and government in recent years is embodied in the new Halifax Ocean Innovation Centre and the new Volta Labs space, both of which are part of a larger pursuit to support partnerships (Morley 2015).

Attracting and retaining a skilled and educated workforce is key to economic development in the region. Additionally, the retention of the large, annual influx of students (both international and out-of-province) plays a large part in the economy. As the seat of government, Halifax also attracts a large and growing administrative and professional service. The HGNP will support healthy environments and high quality lifestyles that help attract and keep staff.

Figure 2. Employment in the HRM by sector, 2014 (Canada n.d.)



2.5 POLICY AND PUBLIC LANDS MANAGEMENT

The HRM comprises a mosaic of public and private lands, across a number of jurisdictions (Map 14).There are many governmental parties involved in the management of lands and water, the harvesting and extraction of natural resources, and activities with cultural, economic and environmental impacts within the HRM. The federal and provincial governments in their policies, plans, regulatory regimens and initiatives directly affect and constrain what HRM can accomplish within its municipal boundaries. There are also opportunities for collaborative and mutually supportive initiatives that meet similar common goals. The HGNP has the potential to enable further exploration of these opportunities. A review of the current policy and land management context follows.

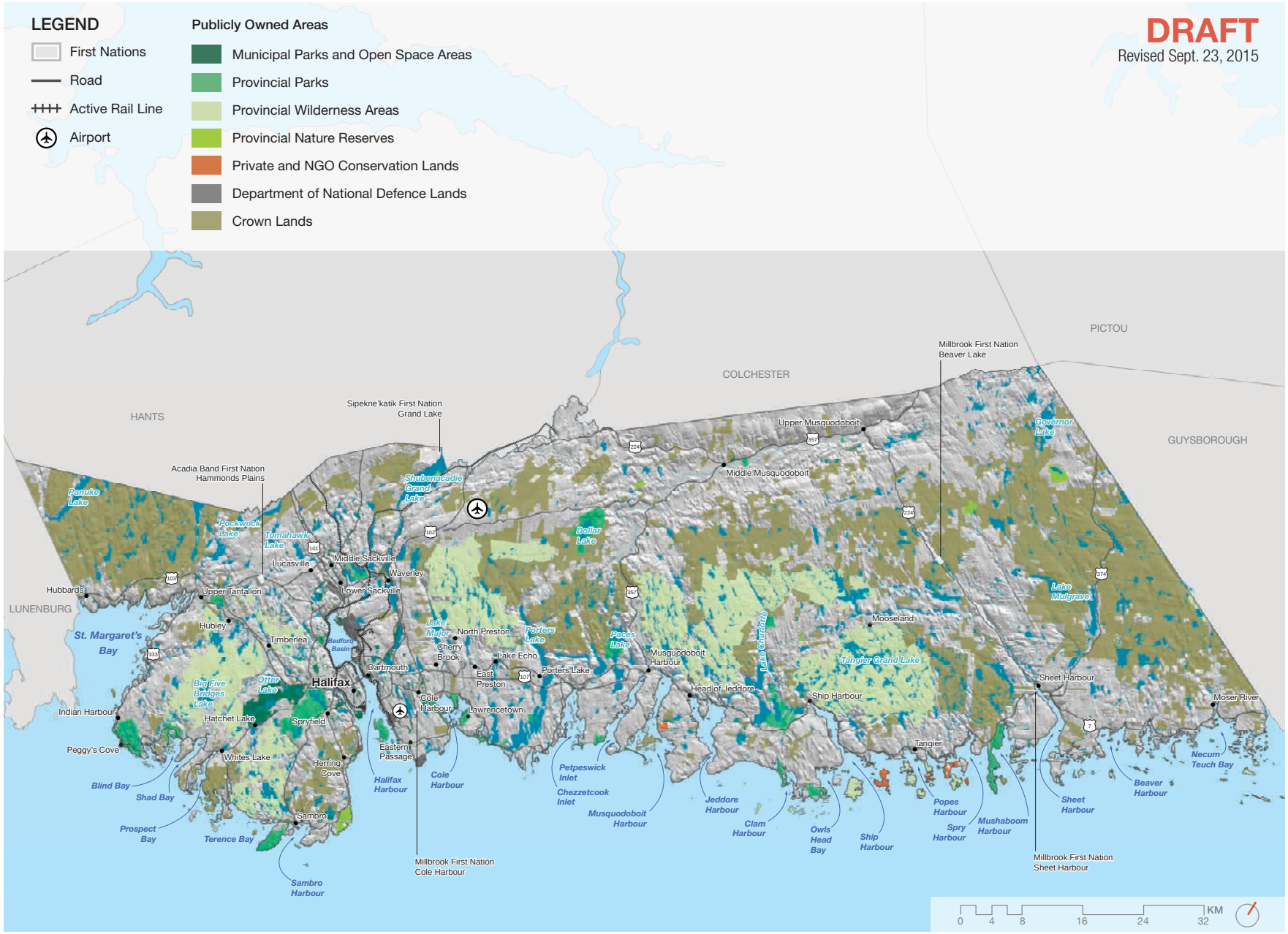
2.5.1 Federal Responsibilities

In the HRM, the federal lands and properties are mostly connected to responsibilities and jurisdiction in defence, marine fisheries (wharves and harbours), marine transportation and navigation (lighthouses and beacons), national transportation infrastructure (Stanfield Airport, Port of Halifax) national historic sites and heritage properties (the Citadel, Halifax Harbour forts and Point Pleasant Park), coastal waters up to the high water mark (with the exception of a few water lots), Aboriginal Affairs (lands occupied by First Nations), and some harbour islands (e.g., McNabs, Georges, Devil's Island). With no national wilderness parks in HRM, the total area of federal land is only a small part of the overall land base. Most of the Federal properties have a defence, administrative or navigational function.

2.5.1.1 Heritage Protection and Conservation

The federal role in heritage protection and conservation is significant in the HRM. Most of the national historic sites are related to the military or marine heritage and are therefore located along or close to the coast. Several are important tourist attractions in the region, the most notable being the Citadel and Point Pleasant Park. Lighthouses are an important heritage resource and are iconic of the maritime coastline. Most are owned by the federal government. The federal

Map 14. Public Lands



responsibility for lighthouses was recently reviewed and it was determined that all but a few will be removed from the list of government properties. De-listed lighthouses will only continue to be maintained if they are taken over by community groups. Many lighthouses in the HRM are known to be affected by this new situation and the future of several others is still under consideration. The future of the majority is uncertain.

2.5.1.2 Environmental Conservation

Federal statutes that are important for environmental conservation include:

- ***Canada Water Act*** (Environment Canada), which can be used to protect water resources and promote sustainable management of water use;
- ***Species at Risk Act*** (Environment Canada), which protects endangered and vulnerable plants, animals and birds;
- ***Migratory Birds Convention Act*** (Environment Canada), which protects birds and their habitats along migration routes;
- ***Navigable Waters Protection Act*** (Transport Canada), which protects the public right of navigation;
- ***Canadian Environmental Assessment Act*** (Canadian Environmental Assessment Agency), which sets out federal requirements for environment assessment of scheduled activities affecting federal lands, regulation, jurisdiction and interests; and
- ***Fishing and Recreational Harbours Act*** which involves the management of small craft harbours. Since 1995, this has included the divestment of many harbours to local authorities.

The National Park system also plays an important role in environmental conservation at a provincial level but not in the HRM.

The federal government has been instrumental in preventing damage to the spawning habitat of migratory fish through habitat protection provisions of the *Fisheries Act* (1986), administered by the Department of Fisheries and Oceans (DFO). It was particularly important in minimizing disturbance during construction activities near and across fresh water bodies and minimizing siltation. However, when the Act was amended in 2012 this role was dramatically reduced and now applies only to a relatively small number of Aboriginal, commercial and recreational fisheries.

2.5.2 First Nations

First Nations lands in the HRM are designated for the use of the Mi'kmaq bands of Millbrook, Sipekne'katic (Indian Brook) and Acadia. Some of these lands have permanent communities or residents and some do not.

First Nation rights originate in the traditional use and occupancy of land and are recognized in the *Constitution Act*, 1982. These rights encompass all aspects of life, including culture, land, and traditions. The term "treaty rights" refers to those guarantees explicitly and implicitly agreed upon through historical treaties. Under the terms of these treaties, First Nations peoples agreed to share the land in return for specific rights, which apply to current and future generations. Those that affect First Nations of Nova Scotia include: Treaty of 1725 (and subsequent ratification treaties); Treaty of 1752; Treaty of 1760; 1760-61 Peace and Friendship Treaties; The Royal Proclamation 1763; and Treaty of Watertown 1776. These treaties give First Nations the right to use of lands and coastal resources, but do not give ownership right or legal jurisdictional authority. The Department of Indian and Northern Development holds the land in trust and may delegate authority to manage reserve lands to the Councils of registered bands.

To address outstanding issues related to Aboriginal rights in Nova Scotia, a tri-partite forum has been established between the Mi'kmaq, and the governments of Nova Scotia and Canada. The aim is to resolve issues related to Mi'kmaq treaty rights, Aboriginal rights, Aboriginal title, and Mi'kmaq governance. In 2007, the Parties signed the Mi'kmaq-Nova Scotia-Canada Framework Agreement, which outlines procedures that will guide the negotiations and the topics to be covered. This Agreement states that the objectives of the Process are "to create stable and respectful relationships and to reconcile the respective

interests of the parties through a Mi'kmaq of Nova Scotia Accord that sets out the manner in which the Mi'kmaq of Nova Scotia will exercise constitutionally protected rights respecting land, resources and governance, to the extent the issues are dealt with in the Accord".

Under the Agreement, the parties may establish working groups to examine certain issues in more detail and make recommendations. Currently, there are three working groups that influence the use of resources in the province: Forestry Working Group, Fisheries Working Group, and Land Protection Working Group. First Nations are negotiating the right to limited harvesting of forest resources on Provincial crown land, and engage in a small scale commercial fishery in addition to a food fishery. The balance between wildlife conservation and harvesting, particularly moose, is also being addressed.

The provincial Parks and Protected Areas Plan helps to protect lands that are important to the Mi'kmaq of Nova Scotia. These lands may be used for hunting, fishing, and other traditional activities and some have special cultural and spiritual significance. The province will continue working with the Mi'kmaq to explore options relating to the Mi'kmaq use of, and involvement in, the management of parks and protected areas in a manner consistent with legislative protection requirements, and in keeping with the Mi'kmaq concept of Netukulimk, which celebrates the cultural and spiritual connection between the natural and human environments. There is also ongoing research into archaeological sites by local universities and the Natural History Museum of Nova Scotia.

Most provincial resource management initiatives now integrate Mi'kmaq consultation and recognize aboriginal traditions and practices with respect to land use.

2.5.3 Provincial Land Use Policies and Strategies

Crown land is owned by the Province and managed by the Department of Natural Resources (DNR) on behalf of the citizens of Nova Scotia. Of the 5.3 million hectares of land in Nova Scotia, about 1.53 million hectares (3.8 million acres or about 29% of the province) is designated as Crown land. In addition, most of the sea bed along the Province's 9,000 km of coastline is also considered Crown land.

Nova Scotians can enter Crown land for recreational purposes, but harvesting activities such as hunting, trapping, fishing and tree cutting are controlled through regulation and licensing. Many trails have been built on Crown lands. Some are old transportation routes – such as old coach roads – while others may have been old footpaths or roads constructed for forestry access at an earlier time. The right to use Crown land for recreation comes with an obligation to leave the environment in its natural state. Trees and underbrush must not be cut, plants may not be dug up and removed, and wildlife must not be disturbed.

Many acres of Crown lands are licensed for a variety of economic activities. These include cranberry bogs, forestry operations, mines, peat bogs, power lines, wind energy, broadband towers and tidal energy. Public recreational activities on Crown land must not interfere with the rights of those holding leases or licenses with the Province.

2.5.3.1 Natural Resources

The Province's geographic land boundary extends inland from the low water mark on the coast. For the most part, the property between the ordinary high and low water mark is provincial Crown land and thus all beaches are owned by the Province. The federal government has retained ownership of property for wharves, piers, marine transportation infrastructure and in a few places there are pre-confederation water-lots attached to private properties.

The Province has exclusive jurisdiction over the management and sale of provincial public lands; property and civil rights, exploration, development, conservation and management of non-renewable (mineral) resources; the

management and harvesting of forestry and wildlife resources; surface water resources; and municipal institutions. It also has regulatory responsibility for certain aspects of coastal environments such as salt marshes and beaches (The 2009 State of Nova Scotia's Coast Summary Report, CBCL 2009).

Provincial responsibility for the management and utilization of land-based natural resources, water bodies, marshes and wetlands in Nova Scotia rest mainly with the provincial departments of Natural Resources (DNR) and Environment (DOE), with smaller roles played by the Departments of Agriculture (DOA) and Fisheries and Aquaculture (DOFA).

In 2011, DNR released The Path We Share – A Natural Resource Strategy for Nova Scotia 2011-2020. This document set out a new vision for the use and development of provincial resources that integrates economic development and environmental stewardship. This vision applies to all land – private and public – and sets out goals for biodiversity, forests, geological resources and provincial parks. The vision is to be realized through collaborative actions involving the Mi'kmaq of Nova Scotia, land owners, business and industry representatives, environmental groups, community groups, academics and municipalities.

2.5.3.2 Forest Resource Management

DNR has broad responsibilities for the development, management, use, conservation and protection of provincial forest resources. It regulates forestry activities on Crown land and promotes, advises, and supports, but does not control, forestry operations on private land. Forest harvesting activity is enabled through the *Forests Act* and supported through research, natural resource management, conservation and protection, and a harvesting licensing process. The purpose of the Act is to:

- Develop a healthier, more productive forest capable of yielding increased volumes of high quality products.
- Encourage the development and management of private forest land as the primary source of forest products for industry in the Province.
- Support private landowners to make the most productive use of their forest land.
- Provide effective management of all Crown lands.
- Maintain or enhance wildlife and wildlife habitats, water quality, recreational opportunities and associated resources of the forest.
- Enhance the viability of forest-based manufacturing and processing industries.
- Double forest production by the year 2025.
- Create more jobs immediately and in the longer term through improved productivity.

DNR is currently undertaking a comprehensive Ecological Landscape Analysis of the entire province including all undeveloped private and public lands. It will use this ecosystem-based management approach in the future to manage landscapes in as close to natural state as possible, to maintain biodiversity, to sustain ecological processes, and to support long-term productivity.

2.5.3.3 Western Crown Land Block

Much of the eastern Crown land resource is already under harvesting license so DNR is currently focusing its attention on the 1.5 million acres called the Western Crown lands. This block is made up of many small parcels, which have now been consolidated following the acquisition by the Province of 0.5 million acres of Bowater Mersey lands 2012. They cover most of the province west of Highway 101. A Conceptual Plan for Western Nova Scotia was released by DNR in 2014. The planning process for western Crown land was collaborative as reflects the goals of the Natural Resources Strategy (2011) and involved representatives from government, the private sector, interested citizens, Mi'kmaw people, stakeholder groups and communities in the western region.

The Western Crown Lands are made up of three blocks, one of which is the St. Margaret's Bay District located largely within the HRM. A Community Forest proposal for this land was recently submitted by the St. Margaret's Bay Stewardship Association, but was not accepted.

2.5.3.4 Minerals and Mining

The Geoscience and Mines branch of DNR has broad responsibilities for the development, management, and regulation of mineral resources and mining. These include metallic minerals (e.g., gold, copper, lead, and zinc), aggregates (e.g., sand, gravel, and crushed rock) and industrial minerals (e.g., gypsum, salt, and coal). These responsibilities are defined under the *Mineral Resources Act* and the *Mines Act*.

On private land, the owner has the right to develop resources such as sand, gravel, aggregate, and limestone that are accessible from the surface. All other mineral rights are held by the province. Any person can apply for a license and pay a fee to explore for mineral deposits. To do this they must first stake a claim, which is time limited. The applicant must report results to the Province. If the 'find' is deemed of commercial interest, further license must be sought, detailed development plans prepared and environmental approval sought. If a mine is actually constructed, the operator must apply for a lease and pay royalties to the Province. In Nova Scotia, most of the economic benefit to the Province comes from employment and the supply of goods and services to the industry.

2.5.3.5 Wildlife and Biodiversity

The *Wildlife Act* that is administered by DNR is aimed at the conservation of wildlife species and their habitat. The Act regulates wildlife resource use in the form of angling (DOFA), hunting, and trapping. In addition, the *Endangered Species Act* (DNR) provides for the protection, designation, recovery, and conservation of species at risk in the Province. DNR and DOFA collect information on wildlife populations and habitats and use this data to manage hunting, trapping, and recreational fishing, and to identify, inventory, and monitor vulnerable habitats and populations and overall population health.

DNR is also involved in promoting biodiversity as a measure of ecosystem health and works with other departments and agencies to support enforcement and management of significant habitat. For example, in 2002, the Province adopted Wildlife Habitat and Watercourse Protection regulations that are designed to protect water quality and to maintain various elements of wildlife habitat on all forest harvest sites. These new laws are mandatory on all lands; private, industrial, and Crown.

2.5.3.6 Parks and Protected Areas

As part of its agenda for sustainable development set out in the *Environmental Goals and Sustainable Prosperity Act* (2007), the Province committed to protect over 12% of the total land mass of the Province. This goal will be reached and exceeded by the end of year 2015 through the Our Parks and Protected Area Plan (2013) which will ultimately protect over 13% of the provincial land base. This Plan also meets the commitment made to an integrated and sustainable parks and protected areas program that was made in the Natural Resources Strategy for Nova Scotia (2011). These properties will come under the joint management of DNR and DOE.

Provincial protected areas that count toward this legal protection goal fall under three different designations:

- **Wilderness areas** which protect nature and support wilderness recreation, hunting, sport fishing, trapping, and other uses.
- **Nature reserves** which offer the highest level of protection for unique or rare species or features; the reserves are mostly used for education and research.
- **Provincial parks and reserves** protect nature and support a wide range of heritage values and opportunities for outdoor recreation, nature-based education, and tourism. Only those whose main intent is to protect nature count toward this goal. Other parks protect cultural and recreational features.

Overall, the Protected Area Plan adds four new provincial parks, 44 new wilderness areas, and 118 new nature reserves. It also expands 12 provincial parks, 31 wilderness areas, and 11 nature reserves.

Within these protected areas, resource use and development is not permitted. This includes forest harvesting, road and utility corridor development, and hydro and wind energy development. In addition, new mineral or petroleum rights will not be granted. Existing leases and rights will be dealt with under the applicable legislation and full protection will not be implemented until the mineral rights are no longer present. This will require consultation and negotiation with rights holders. In some cases activities may be permitted to continue, provided the activities do not degrade the area.

Low impact recreation and nature-based tourism will be permitted in all areas. Hunting and trapping will be permitted in wilderness areas, but not in nature reserves or provincial parks. Sport fishing will be permitted in parks and wilderness areas, but not in nature reserves. Off-road vehicles will not be permitted in any of the areas. Automobiles will be allowed on park roads, but not in nature reserves.

The impact of this protection on Aboriginal use of lands for hunting, fishing, and gathering has yet to be fully resolved. This issue will be addressed through the Mi'kmaq-Nova Scotia Protected Areas Selection and Management Technical Advisory Group and a mechanism is being sought to engage the Mi'kmaq in the management of the protected areas.

In the HRM, the goal to raise funds to acquire land in need of protection has been reached with the active support of Nova Scotia Nature Trust. The Trust is in the process of raising $7 million to bring in the 100 wild island archipelago between Clam Harbour Beach and Mushaboom Harbour to this protected area plan (www.100wildislands.ca).

Legally protection for all the properties will be provided under the *Provincial Parks Act*, the *Wilderness Areas Protection Act*, and the *Special Places Protection Act*.

2.5.3.7 Water Bodies, Marshes and Wetlands

The protection and management of surface fresh water resources is the responsibility of the Department of the Environment (DOE). This includes protecting water supply watersheds, regulating water course alteration and wetland alteration, designating Special Places, contributing to wilderness area protection, and the control of off-highway vehicles in vulnerable areas and protected watershed areas. The Province allows the withdrawal of surface water without a permit for amounts of up to 23,000 litres per day. Groundwater resources are mapped and monitored by DNR.

The Nova Scotia Wetland Conservation Policy was established in 2011. This policy, applies to all naturally occurring freshwater and tidal wetlands in Nova Scotia (e.g. salt marshes and coastal saline ponds, including barachois ponds and tidal lagoons) that are over 100 square metres in area. It does not include any wetland that has developed as the result of construction or wetlands that are used as agricultural land and are designated as 'marshlands' under the *Agricultural Marshland Conservation Act*.

The primary conservation objective of the policy is to manage human activity in or near wetlands, with specific goals to achieve no loss in Wetlands of Special Significance and to prevent net loss in the area and function of other wetlands. Wetlands of Special Significance include:

- All salt marshes.
- Wetlands that are within or partially within a designated Ramsar (international wildlife management) site, Provincial Wildlife Management Area (Crown and Provincial lands only), Provincial Park, Nature Reserve, Wilderness Area, or lands owned or legally protected by non-governmental charitable conservation land trusts.
- Intact or restored wetlands that are project sites under the North American Waterfowl Management Plan.
- Wetlands known to support at-risk species designated under the federal *Species At Risk Act* or the *Nova Scotia Endangered Species Act.*
- Wetlands in designated protected water areas.

With respect to other wetlands, DOE intends to update the provincial wetland inventory to assist the government and the public in identifying wetlands around the province. The intent is to eventually use the inventory as the primary source for wetland identification. Wetland alteration, of any kind, on private land requires a permit, and may involve the payment of compensation.

2.5.3.8 Aquaculture

Aquaculture is the controlled farming of freshwater and marine finfish, shellfish and some aquatic plants. The industry is comprised of about 44 fish-farming businesses in Nova Scotia and is a significant contributor to the provincial economy. It generates over $54 million of product per year and employs approximately 630 people. The industry is both marine and land-based and approximately 80% of the value of the product comes from farmed salmon.

The industry has existed in the province for many decades, during which it remained very small. Only recent, new markets and increasing interest in seafood has led to a period of sustained growth in the industry, and the development of larger and more numerous operations. This growth has met considerable opposition in Nova Scotia. Initially, marine aquaculture sites – mostly salmon pens – were strongly opposed in many coastal communities, due to concern about gear conflict with more traditional forms of marine harvesting such as lobstering. More recently, concerns have focused on environmental issues, such as environmental degradation from waste products and the spread of disease.

The Province released an Aquaculture Strategy in 2012 that sought to address many of these issues, but controversy continued. In 2014, a second independent report A New Regulatory Framework for Low-Impact/High-Value Aquaculture in Nova Scotia (Doelle-Lahey Report) was released. It calls for a complete regulatory overhaul of the industry in order to ensure that environmental and social costs are minimized over time, while the economic benefit and social value is increased. Until the changed regimen is fully in place, controversy can be expected to continue.

2.5.3.9 The Coastal Management Challenge

The coastline of HRM presents a special management challenge because of its overlapping federal, provincial, and municipal jurisdictions and its special function as an important area for economic activity, tourism, recreation, and residential development. The report 2009 State of Nova Scotia's Coast Technical Report sets out the complexities and challenges of providing effective environmental management. Three important themes from the report summarized here are public access, the impact of climate change, and the role of municipal planning.

PUBLIC ACCESS

The *Beaches Act*, 1989, which is administered by DNR, provides for the protection of beaches and associated dune systems as significant and sensitive environmental and recreational resources. The Act also provides for the regulation and enforcement of the full range of land-use activities on beaches, including aggregate removal, recreational, and other uses that may cause undesirable impacts on beach and associated dune systems. There are no privately owned coastal beaches in the province. However, private usage has become a de-facto situation in many parts of the coast where public beaches are not accessible or are poorly marked.

There is currently no federal or provincial legislation that ensures universal access to the coast and many laws restrict access by preventing trespassing, regulating economic activities, restricting the use of vehicles, and building infrastructure such as wharves and ramps. On the other hand, the government promotes coastal access in other ways, such as by having public wilderness trails, parks, protected areas, and touristic sites.

The public's perception of access to the coast varies, but people are generally concerned about the extensive private ownership of the coastline, the lack of good coastal planning, and the need to designate, maintain, and provide access to coastal frontage for public use.

IMPACT OF CLIMATE CHANGE

Nova Scotia is subjected to a wide range of storms in the North Atlantic, including tropical storms and hurricanes. Storms, such as these, can cause enormous social and economic harm by damaging property and infrastructure, and by putting human life and livelihoods at risk. Storm surge is a particularly important phenomenon, because it causes waves to pile water onshore, creating a higher potential for damage. Projections by researchers show that because of climate change, tropical storms in the Northern Hemisphere will get more intense and track farther north than previously experienced. This outcome, combined with the rise in sea level, means that a storm's consequences to the coast are likely to increase over time. Potential effects on our land and communities include high economic, social, and ecological costs. One of the most recent major storms, Hurricane Juan, caused a total of $130 million in damage to Nova Scotia – most of which was incurred in the HRM.

THE ROLE OF MUNICIPAL PLANNING

Many Nova Scotian communities have evolved from fishing settlements along the coast. Over the years they have grown incrementally in a linear pattern along shoreline roadways. Easy access from these roads has made waterfront property highly desirable and much of the coastal property is now privately owned. This pattern of sprawling coastal development limits access and often affects the coast negatively. It is also not the best way to sustain an area's communities and resources over the long-term. Actions that could be taken through the planning process include:

- identifying areas prone to erosion and/or inundation so that development setbacks can be strengthened for additional protection of vulnerable properties and infrastructure;
- further restricting encroachments on coastal wetlands to strengthen their important biological and storm buffering function;
- wherever possible, increasing public access; and
- promoting clearer community boundaries by focusing appropriate growth in defined coastal centres.

2.5.3.10 Provincial Transportation Network

The construction and maintenance of provincial roads rests with the Department of Transportation and Infrastructure Renewal. The province has responsibility for 23,000 kilometres of roads and highways and 4,100 bridges. Of these, the 100-series highways within the HRM (Highways: 101, 102, 103, 107, 111 and 118) define the major growth corridors for the Region.

The network continues to expand with implications for ongoing growth and for the integrity and continuity of greenspace. The Province is currently planning two major new roadways for the region – the Burnside Bypass, a major extension to Highway 107; and Highway 113, a connection between Highway 102 and Highway 103 (Stantec Consulting and Gardner Pinfold Consultants Inc. 2013). Work on the Burnside Bypass starts in 2015-2016 and will take three years. A completion date and project timeline for Highway 113 has not been established. Other major projects in the Department's five-year plan, for the expansion and enhancement of the 100 series road network, include the following projects in the HRM:

2015-16:

- Highway 103: Ingramport Interchange (Exit 5-6) (Multiple Year Project)
- Partridge River: Hwy 107 (Multiple Year Project)

2016-17:

- Highway 118 Overpass: Portobello North Bound Lane

2018-19:

- Prospect Road Interchange Overpass: Hwy 102/103

2.5.3.11 Cultural and Heritage Planning

The Province, through the Department of Communities Culture and Heritage (DCCH), has responsibility for provincial heritage properties and 'Special Places' – these are sites that are recognized and protected owing to their special archaeological, ecological, and geological importance to the Province. The DCCH is also responsible for the Peggy's Cove Preservation area.

PROVINCIAL HERITAGE PROPERTIES

Historic buildings, industrial sites, streetscapes, buildings, and landscapes are all part of the provincial heritage. They may be publicly or privately owned. The Province undertakes work on provincial heritage properties and supports the efforts of eligible private property owners to conserve their heritage properties, by providing conservation advice and conservation work grants.

The Province is currently preparing amendments to the *Heritage Property Act* to clarify regulations for municipalities in the identification, treatment, and management of areas of cultural importance. They should provide municipalities such as HRM with clearer guidance regarding the designation of Heritage Conservation Districts, Cultural Landscapes, and other cultural amenities.

NOVA SCOTIA MUSEUM

The Nova Scotia Museum is comprised of 27 unique museums, historic buildings, heritage farms, and villages in the province. It also manages more than one million artifacts and specimens. Research grants are made available to undertake original research of cultural history, natural history, marine history, industrial history, and species at risk.

SPECIAL PLACES PROTECTION

Nova Scotia is home to heritage sites that date back to prehistoric and geological times. Major discoveries of artifacts and fossils have occurred here that are of international significance. The *Special Places Protection Act* provides the Province of Nova Scotia with a mandate to protect important archaeological, historical, and palaeontological sites and remains, including those underwater. The Culture and Heritage Development division of the DCCH administers the Act by overseeing the protection of all sites and remains in the Province, managing the Heritage Research Permit system, and designating outstanding heritage sites as 'Protected Sites'.

2.5.4 Municipal

The Province's *Municipal Government Act* gives authority to municipal councils over governance within their jurisdiction, including land use planning. The Act also includes five statements of provincial interest, which direct and guide provincial and municipal land use decisions. These statements outline the province's vision for protecting Nova Scotia's land and water resources. They also address issues related to the growth of communities. Statements of provincial interest are adopted as regulations under the Act, and are intended to help provincial government departments and municipalities make land use decisions that support the principles of sustainable development. Four pertinent statements to the HGNP are:

- to protect municipal drinking water supply areas;
- to make the best use of existing infrastructure;
- to reserve high quality farmland; and
- to prevent the development on known floodplains.

Land use planning is carried out by way of municipal planning strategies, zoning, and land use by-laws. Other tools include land acquisition and easements.

In 2008 the Province enacted An Act Respecting the Halifax Regional Municipality, also referred to as the Halifax Regional Municipality (HRM) Charter. This includes powers with regard to planning that are different from other municipalities. With the addition of amendments, the HRM now has a unique set of planning tools.

2.5.4.1 Regional Planning

The principles underlying the Regional Plan are strongly influenced by the need for environmental, cultural, and financial sustainability.

In the context of the HGNP, the Regional Plan:

- Preserves and promotes sustainability of cultural, historical, and natural assets;
- Supports the Regional Centre as the focus for economic, cultural, and residential activities;
- Manages development to make the most effective use of land, energy, infrastructure, public services and facilities, and fosters healthy lifestyles; and
- Ensures opportunities for the protection of open space, wilderness, natural beauty, and sensitive environmental areas.

Maps and plans have been developed around the following themes:

- Settlement and Transportation
- Trails and Natural Networks
- Parks and Natural Corridors
- Significant Habitats and Endangered Species
- Cultural Significance
- Areas of Elevated Archaeological Potential
- Blue Mountain - Birch Cove Lakes Conceptual Park Area
- Water Supply Areas
- Growth Centres

LAND USE PLANNING TOOLS

There are 18 planning districts in the HRM each of which has a Municipal Strategy (MPS) and associated Land Use By-law (LUB). The MPS sets out the principles and policies that will guide the development of the planning district, while the LUB is the legal document that makes the MPS legally enforceable. In addition, the municipality uses the Regional Subdivision By-law to regulate the subdivision of land throughout HRM and establish design standards for public streets, sidewalks, and municipal parkland dedication.

It also uses Plan Amendments, Development Agreements, Rezonings, and Site Plan Approvals as regulatory tools to allow for discretionary approvals by Regional Council or Community Councils. These tools offer flexibility; however, statutory requirements are still imposed on the approval process and appeals.

CULTURE AND HERITAGE PLANNING

Beyond the overarching heritage and cultural objectives established in 2014, the HRM has two plans adopted by the HRM to address cultural and heritage planning. The first, the HRM Cultural Plan (March 2006) provides a vision and policy framework for building HRM's cultural identity, increasing creative opportunities for citizens, and fostering the creative economy. The HRM Cultural Plan identifies 7 pillars that, taken together, serve to define citizens' communities and their sense of place: Heritage, Arts, Life-long Learning, Community Diversity, Leisure and Celebration and Economic Development. The Cultural Plan is a long-range strategy for cultural investment and development.

A second plan is in the preliminary stages. The Culture and Heritage Priorities Plan will provide greater direction for strategic planning and investment in culture and heritage. The Priorities Plan is projected to be conducted in two phases: Phase 1 - Inventory, and Phase 2 Analysis and Prioritization. Phase 1 will, among other things, address a key theme of the HGNP: Cultural Landscapes and areas of significance to Aboriginals and other diverse ethnicities of the HRM. The HGNP will address the preliminary identification and prioritization of landscapes of cultural significance to the communities of the HRM. It will also make recommendations for Regional Council's consideration of potential Cultural Landscape Program development and, as such, will be a valuable adjunct to the Priorities Plan.

PRIORITIES PLANS

In the 2006 Regional Plan, 21 Function Plans were identified. Many were completed and are now being implemented. Of these, one of the most significant for the HGNP is the Urban Forest Master Plan. In the 2014 amendments, the remaining functional plans are listed as Priority Plans and work is currently in progress to complete them. A Priorities Plan is intended to function as a management plan which provides more detail on the actions required to carry out the plan's policy directives. The priority plans that are most pertinent to the HGNP are as follows:

- Halifax Harbour
- Transportation
- Active Transportation 2014
- Road Network 2010
- Greenbelting and Public Open Space Priority Plan (renamed the Halifax Green Network Plan)
- Community Facilities Master Plan 2008 (currently undergoing a review and update, anticipated for completion in 2016)
- Western Common Wilderness Common Master Plan 2010
- Dartmouth Common Master Plan 2010
- Culture and Heritage Priorities Plan
- Inventory of Municipally owned heritage assets
- Barrington Street Heritage Conservation District (HCD) 2014

In addition to the Barrington Street Conservation Districts, the HRM is proposing three additional districts: Barrington Street South, Schmidtville, and Historic Properties. Conservation Districts are enabled through the *Heritage Property Act* of Nova Scotia, which allows for the identification, preservation, and protection of heritage properties, heritage conservation districts, and the use of heritage protection bylaws to preserve areas or communities of historic or architectural significance. The Province is currently reviewing the Act with the goal of clarifying the legal provisions for cultural districts and other cultural landscapes.

HRM BUSINESS PARKS FUNCTION PLAN (2008)

This serves as a strategic plan for the future expansion of business parks within the HRM. It was prepared in response to the growing demand for industrial land and the recognition that much of the land already designated for industrial use is constrained by wetland conservation requirements. It emphasizes the need to protect existing industrial lands with high capacity for general industrial uses, and the need to identify and secure lands for future industrial development.

2.5.4.2 Community Planning

The 18 planning districts in HRM each have an MPS and LUB. The following table lists the plans, the date they were prepared, and the date of the last consolidated amendment.

Many of the MPS are quite dated and the 2014 Regional Plan committed to updating and consolidating the planning strategies to reflect changing demographics, community visions, and emerging issues. The Regional Centre Plan is underway and will consolidate and improve upon the strategies and land-use bylaws for the urban core. Work is also commencing on updates to other community plans. If changes to planning documents are required to implement the HGNP, this will likely occur through plan amendments and the secondary planning updates.

The HRM has also completed a number of additional studies and plan reviews, including but not exclusive to the following:

- Dartmouth Main Street Area Plan Review (2009)
- Bedford Waterfront Design Study (2010)
- Birch Cove Waterfront Plan (2010)
- Fall River Community Vision and Action Plan (2007)

TABLE 2. PLANNING DISTRICTS AND COMMUNITY PLANS WITHIN THE HRM

Plan Area	Date of MPS	Date of last consolidated Amendment
Beaverbank/Hammonds Plains/Upper Sackville	1999	2014
Bedford	1996	2015
Chebucto Peninsula (District 5)	1995	2014
Cole Harbour/Westphal	1993	2012
Dartmouth Dartmouth Downtown	1978 2000	2015 2013
Eastern Passage /Cow Bay	1992	2012
Eastern Shore (East)	1996	2006
Eastern Shore (West)	1996	2006
Halifax Downtown Halifax Barrington Heritage District	1978 2009 2009	2015 2014 2014
Lake Echo/Porters Lake (Districts 8 & 9)	1998	2006
Lawrencetown	1990	2006
Musquodoboit Valley/Dutch Settlement	1996	2014
North Preston /Lake Major/Lake Loon/Cherry Brook/East Preston	1993	2006
Prospect (District 4)	1994	2014
Sackville Sackville Drive	1994 2002	2014 2010
Shubenacadie Lakes (Districts 14 & 17)	1998	2014
St. Margaret's Bay (Districts 1 & 3)	1995	2015
Timberlea/Lakeside/Beechville	1992	2014

In addition, a comprehensive planning process is to be initiated for the potential new community of Port Wallace, which is located on the northeastern edge of Dartmouth. The subject lands lie on both sides of Lake Charles and are adjacent to Shubenacadie Park, extending eastwards to the Forest Hills Extension.

Other relevant amendments, studies and reports include:

- Watershed studies (see Section 2.5.4.6)
- Parkland Dedication (Regional Plan Amendment (2007)
- Sea Level Rise Adaptation Planning for Halifax Harbour (presentation to Council 2010)
- North West Arm View Plane Study (Information Report to Council 2010)
- Nova Scotia's Water Resources Management Strategy (2010)
- A Guide to Open Space Development in HRM (2007)
- HRM Policy on River Daylighting (2006)
- Environmental Impact Assessment Report Highway 113 (2009)

2.5.4.3 Transportation Planning

Transportation planning in the HRM incorporates the enhancement and expansion of the existing road network to carry vehicles more efficiently between the urban centre and surrounding suburban and rural growth centres. It also incorporates transportation demand management, active transportation, and transit planning to reduce the number of vehicles (Halifax Regional Municipality 2014). Overall, by 2031 the impact of these measures is projected to be a 5% drop in trips to work by automobiles from its current level of about 77% (2011). However, the benefits of the plan include reduced pollution and energy consumption, through ride sharing and transit use, and increased health benefits, from biking and walking.

The Road Network Priority Plan includes five projects with potential impacts on the green network. The projects described as 'future potential' have been identified for construction within the 25 year time frame of the plan. The HRM is currently engaging with the public on this Plan, as directed by the Regional Council, since adopting the 2014 Regional Plan.

- Highway 107 Extension (Burnside Bypass) - scheduled
- Herring Cove Road widening to Old Sambro Road - scheduled
- Beaverbank Bypass – future potential
- Highway 113 – future potential
- Highway 107 Extension (Cherry Brook By-pass) – future potential

2.5.4.4 Urban Forestry Planning

The Urban Forest Master Plan (2013) was developed by HRM staff in close cooperation with Dalhousie University's School for Resource and Environmental Studies (SRES). The overall goal of the UFMP is to ensure a sustainable future for the urban forest and ensure that HRM residents can enjoy the environmental, health, and economic benefits trees provide.

The urban forest extends approximately 15 km outwards from Halifax Harbour and is geographically defined by HRM communities that receive water and wastewater services. Communities receiving these services generally feature compact development types and the nearby urban centre amenities usually associated with urban living. HRM's urban forest can be seen as a seamless natural resource that spans all public and private properties in the serviced communities of Bedford, Beechville, Lakeside, Timberlea, Cole Harbour, Dartmouth, Eastern Passage, Halifax Mainland, Halifax Peninsula, Sackville, and Spryfield.

A survey conducted in 2006-2007 estimated that the canopy cover provided by the urban forest is 43% and that over half is on private property. In the subsequent four years, an estimated 5% was lost to development. The goal of the Plan is to increase the canopy to 53% by planting on public land – road right-of-ways, greenways, trails, and parks.

HRM has been divided into 111 unique urban forest neighbourhoods. For each one an analysis will be completed, the canopy cover assessed, and the planting requirements determined. Planting is proceeding on an area by area basis, as budgets allow. The UFMP will likely be reviewed on 5-year intervals to assess its successes and challenges and to reorient the approach, if necessary.

2.5.4.5 Park Planning

The HRM has over 450 parks, **which vary in size and offer a multitude of amenities and services. The largest include: Point Pleasant Park, the Halifax Commons, the Dartmouth Commons,** Shubie Park, Sir Sanford Fleming (Dingle) Park, Hemlock Ravine Park, and Admirals Cove Park. The Public Gardens is the horticultural jewel. Other smaller, but nevertheless beautiful and enjoyable parks include: Africville Park, Cornwallis Park, DeWolfe Park, Ferry Terminal Park, Fish Hatchery Park, St. Mary's Boat Club, and Sullivan's Pond.

HRM has developed a park classification system that identifies the type of park by its function. There are four categories:

- Neighbourhood Parks – providing unstructured play areas for younger children.
- Community Parks – primarily for youth and adult sport-based recreation.
- District Parks – larger multi-use recreation areas serving several communities.
- Regional Parks – large areas with significant natural resources used for recreation, cultural, and educational activities. These may incorporate federal, provincial, or municipal lands.

HRM plans to create several new regional parks in the municipality including the Blue Mountain-Birch Cove Lakes Park, Western Commons, Feely Lake (Sackville River Greenway), Jacks Lake (Bedford), Porters Lake, and Second Lake Provincial Park.

To improve the function of new municipal parks, the dedicated park land in new subdivisions has been increased from 5% to 10% for most new developments.

2.5.4.6 Watershed and Water Resource Planning

The HRM is home to over 1000 lakes, more than 20 rivers, innumerable streams, and 23 major coastal embayments. Waterways, shorelines, and lakes are a very important part of the landscape in the HRM. They are very attractive for residents, enhance the quality of life in the municipality, offer recreational amenity, and are a very popular focal point for residential development. The intensity of development around them has created problems with water quality caused by activities including: clearing of land; siltation and sedimentation; nutrient runoff from lawns and pet wastes; oil and chemical runoff from streets and roads; and any other contaminants which people discharge into streams, rivers and storm drains. This leads to clouding due to siltation, the growth of aquatic weeds, bacterial contamination, and algal growth. The HRM has responded by establishing a Regional Watershed Advisory Board to advise the Environment and Sustainability Standing Committee of Regional Council, and by undertaking a number of watershed studies to examine the issues, challenges and potential actions on a case by case basis.

Plans have been completed for:

- Sandy Lake
- Preston Area Watershed
- Shubenacadie Lakes sub-watershed
- Tantallon Watershed
- Lake Echo Watershed
- Birch Cove Lakes Watershed
- Musquodoboit Harbour Watershed
- Hubbards Watershed

The HRM commissioned a Water Resources Management Strategy to help guide the municipality's growth in residential settlement and infrastructure. The Strategy, currently being implemented by municipal staff, addressed a wide range of issues, which are identified below:

- Water Resources Management
- Watercourse, Wetland and Coastline Protection
- Service Boundaries
- Wastewater Management
- Stormwater Management
- Performance Measurement

Pursuant to the Water Resources Management Strategy, the HRM commissioned the development of a Stormwater Management Guidelines Manual, which can be used to help create stormwater management systems that provide protection for water bodies.

2.5.4.7 Community Stewardship and Lands Management

Environmental advocacy has had an important role in the evolution of environmental planning in the HRM. National bodies, such as the Nature Conservancy of Canada, provincial organizations, such as Ecology Action Centre and the Nova Scotia Nature Trust, and local heritage protection and environmental stewardship organizations have been active for decades. Since their inception, these environmental groups have made a considerable impact on the public perception of the value of natural and cultural resources.

Some groups have been very active in the acquisition of lands and development of stewardship plans. The Nature Conservancy of Canada is not an advocacy group but focuses on the acquisition and protection of high value lands and natural ecosystems. It has developed a Natural Areas Plan that identifies coastal estuaries along the Eastern Shore, the Musquodoboit River, and functional corridors between high value areas as important conservation areas. Nova Scotia Nature Trust works with private landowners and other partners to protect significant natural areas in the province. These lands are largely protected through acquisition and conservation easements. In Nova Scotia, NSNT also undertakes advocacy campaigns and projects **to identify and protect places of unique environmental value**. NSNT strives to educate Nova Scotians on how to be responsible stewards of their natural heritage.

COMMUNITY EASEMENTS

In the spring of 2012, the Province passed the *Community Easements Act* which provides governments, non-profit groups, and the Mi'kmaq with a new tool for protecting land use and land access. A community easement is a legal mechanism to maintain community or cultural interests in private land, including such things as community access to special places, agricultural or forestry land use, view planes, wetlands, and archaeological sites. The land owner can receive financial compensation from those seeking the community easement for agreeing to place the restriction on the land. To place a community easement on land, a group must be designated under the Act. A community easement is a permanent interest in land that allows a group, the Mi'kmaq, or government to retain the land's traditional use, even if the land is sold.

CONSERVATION EASEMENT ON PRIVATE LAND

A private land owner can also protect their land through a conservation easement - a legally binding agreement between a landowner and a conservation organization, such as a land trust, or government conservation agency that attaches to the title of the land. The land remains the private property of the owner and the decision to place a conservation easement on a property is strictly a voluntary one. However once the easement is in place, it restricts future use of the land. Development restrictions contained in the agreement are registered with the property deed and apply to both current and future landowners. Generally, a Conservation Easement is made for the purpose of protecting, restoring, or enhancing land that contains rare or outstanding species, important habitats, natural ecosystems, land forms, or landscapes that the owner and the province would like to protect for future generations.

3

Open Space Assessment

Open space in the HRM is currently comprised of a complex network of ecological functions; economic purpose; historical and cultural significance; recreational and social spaces; and utilitarian and active transportation corridors. The following sections outline the values, key issues, opportunities, and background knowledge related to the five open space themes: Ecosystems and Biodiversity, Working Landscapes, Recreation and Trails, Communities, and Cultural Landscapes. This section, gathered from existing studies, additional analyses, public and stakeholder input, and best practices, provides context to inform and guide the HGNP.

3.1 ECOSYSTEMS AND BIODIVERSITY

Values: Diverse and healthy ecosystems provide a series of important ecosystem services and benefits, such as provisioning (water, food, and fiber), regulating (climate and water), and supporting natural and built environments (habitats, water filtration).

3.1.1 Biodiversity

VALUES

- Diverse terrestrial and aquatic habitats support a wide range of indigenous and migratory species.
- Well connected natural habitats are found throughout the area, with large tracts of undisturbed lands located in the central portions of the HRM.
- Coastal areas provide important and rare habitats for local breeding populations, and act as stepping stones during migration.
- Numerous wetlands and wetland complexes are found throughout the region.
- An extensive river and stream network flows through a large extent of the region.
- Scenic and varied natural terrain is available near urban development.
- Intact ecosystems offer numerous ecosystem services to communities, including water filtration, air quality, and nearby centres of appreciable biodiversity.
- Remnant forests provide stepping stones for the movement of wildlife in and through urban areas.

KEY ISSUES

- Landscape connectivity and habitat loss, including extensive fragmentation surrounding urban areas, are increasing concerns. Critical areas are vulnerable to expanding residential development, natural resource extraction, and utility/transportation corridor expansions. Areas in the Chebucto Peninsula will imminently be completely cut off from the broader regional landscape by roads and other development.
- Public interest and concern about the sustainability of resources and biodiversity continues to grow, particularly within the contexts of development and industrial activity but also within the impacts of recreational use.
- Biodiversity is an inter-jurisdictional issue requiring strategic objectives that apply to both Public and Private land. Specific guidelines and management strategies may differ in the two areas because of varying activities and land tenure systems. Publicly accessible recreational parks will need to be managed in a different fashion than areas dedicated to conservation efforts.
- Baseline information on biodiversity in the region is still limited, making it difficult to develop specific goals and objectives. A more thorough inventory is warranted to understand the distribution of biodiversity in the region.
- Some rare vegetation types may be at risk from development, but a detailed vegetation inventory of rare plants is not available, making an accurate assessment of the nature and distribution of rare vegetation difficult.
- There is extensive fragmentation surrounding urban areas, resulting in no large forest patches near major settlements and very few mid-sized patches.
- The introduction of exotic species, particularly those that are invasive, may threaten native species.

Map 15. Density of Online Public Comments – Ecosystems and Biodiversity

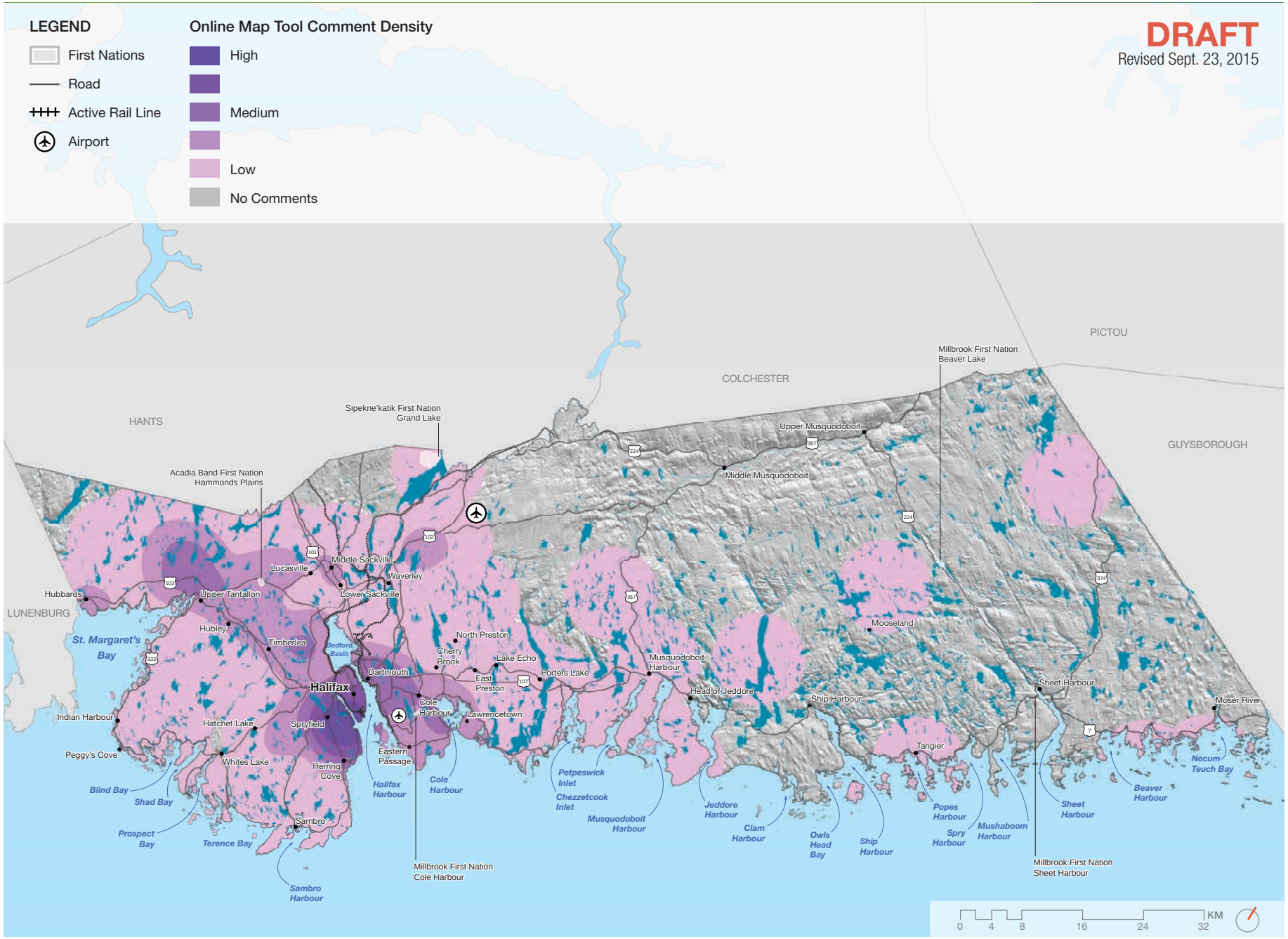


Table 3. Framework for the Conservation of Biological Diversity

Conservation of Biological Diversity	**Ecosystem Diversity**	**Representative Distribution of Ecosystems**	Maintain a diversity of ecosystem types and local elements within the natural range of variability
			Maintain landscape connectivity
			Protect unique and rare landscape elements
	Species Diversity	**Wildlife Habitat**	Maintain wildlife habitat
			Maintain fish and aquatic species habitat
		Species at Risk	Protect or enhance habitats for species at risk
		Rare and Unique Vegetation	Protect rare vegetation
		Species Richness and Diversity	Maintain species richness and diversity on the landscape
	Genetic Diversity	**Reservoir of Generic Diversity Within Species**	Ensure genetic diversity is maintained through connectivity between populations

- Connectivity of populations is impeded by the road network and existing developments, which are highly fragmenting the southern and western portions of the region. Several areas of movement constriction have been identified in the connectivity maps.
  - Connectivity of areas surrounding the urban centre has been reduced.
  - The Chebucto Peninsula faces significant challenges as the highway system, coupled with the existing urban development, impede wildlife movement.
  - The coastal highway partitions most of the small peninsulas and restricts movement onto the mainland areas.
  - New developments to the north and west of the City of Halifax will require careful planning to prevent further loss of connectivity.
- Rural and suburban development increases the likelihood of human-wildlife conflicts. Wildlife encroachment into urbanized areas and urban encroachment into wilderness areas are both problematic.
- Coastal areas contain highly diverse communities of migratory and breeding birds that are threatened by development and heavy recreational use in some areas (e.g. degraded Piping Plover and other important habitats). Unmanaged recreation activities on the shoreline are compromising ecological function in some areas (e.g. Martinique Beach / Bayers Islands Archipelago).
- Aboriginal people have knowledge applicable to biodiversity conservation. To date, Aboriginal traditional knowledge has not been formally incorporated into landscape planning in the region.

KEY OPPORTUNITIES

- In collaboration with the Province, develop a strategy for conservation and restoration of biodiversity on both private and public lands including the development of broad-scale landscape pattern objectives that consider natural disturbance regimes and reflect the range of natural variability. Objectives of this strategy could address disturbance patterns (including forest operations) and patch size, landscape connectivity, species composition, and age class distribution. Policies and processes for implementing these objectives could cover multiple management areas as well as private lands and woodlots.
- Conserve ecosystem diversity.
- Maintaining a diversity of ecosystem types and local features.
- Enhancing landscape connectivity.
  - Maintain large patches of natural vegetation with low road densities in key areas.
  - Ensure wide contiguously vegetated river corridors are retained with limited road crossings and other built infrastructure, wherever feasible.
  - Ensure that additional development avoids important pinch points in disturbed landscapes.
  - Maintain existing corridors in disturbed landscapes.
  - Couple road redevelopment with the creation of wildlife crossing structures to enhance connectivity, fencing to prevent crossing in high-traffic areas, and promote road designs which ensure drivers are aware of wildlife activity.
  - Maintain large undeveloped natural areas in the central portion of the region, ensuring a highly connected landscape through which wildlife movement may occur through multiple paths.
  - Protect unique and rare landscape elements.
  - Continue to map, inventory, and monitor rare and unique landscape elements to ensure they are considered in land use planning.
- In conjunction with other forest management and land use plans, manage the entire green network in an integrated manner to assist in the maintenance of biodiversity objectives.
- In order to contribute to the conservation of regional biodiversity, develop management plans for priority areas in the green network.
- Conserve genetic diversity.
- Use the following tools to conserve species diversity.
  - Develop indicators and establish a regional biodiversity monitoring program.
  - Map and maintain high quality wildlife, fish, and aquatic species habitat.
  - Maintain diverse tree cover to make the area less susceptible to disease and infestation.
  - Map, protect, or enhance habitats for species at risk.
    - Map and protect rare vegetation (species and communities designated as ‘endangered’ or ‘threatened’).

- Conserve and manage coastal areas contain high concentrations of species at risk. These areas also provide migratory stepping stones for species moving along the east coast. Important breeding habitat is found throughout coastal wetland areas. These high quality habitats need to be conserved.
- Work to maintain species richness and diversity in the landscape.
- Incorporate traditional Aboriginal ecological knowledge into natural resource management and biodiversity conservation.

GENERAL DISCUSSION

The diverse landscapes, ecosystems and habitats of the Halifax region support a rich variety of species. There are five major coastal estuaries with extensive mud flats and salt marsh wetland complexes identified in the region (Anderson, et al. 2006). These estuaries are among the richest in the province, containing diverse assemblages of salt marsh, beach/dune, brackish lagoon, island, and rocky shoreline habitats that are critical stopover sites for migratory shorebirds and overwintering sites for waterfowl, as well as nursery grounds for fish, shellfish, and other marine organisms. The coastal shores of the HRM are characterized by a rocky coast with a complex shoreline of inlets, islands, reefs, and bays (McCullough, et al. 2005). The complex nature of the shoreline allows for extensive salt marshes in the area. Of the coastal wetlands in the HRM, estuarine flats comprise the largest area. Most of the extensive coastal wetlands the central portion of the HRM, including Musquodoboit Harbour and Cole Harbour.

Preserving this diversity requires integrated planning and management to maintain ecological processes. The assessment of the existing conditions as well as the development of the green network itself, largely takes a broad-scale or 'coarse filter' approach to biodiversity conservation. This broad scale regional landscape level identification of issues and opportunities provides the context for finer-scale recommendations in later stages of the HGNP and will inform required coordination of the Green Network with forest management plans, land use plans and other development activities. Online public consultation has provided a useful overview of the areas which have been publicly identified as important, valued, or at risk (Map 15). This map highlights current conflict areas, and reflects ongoing public advocacy. The following table (Table 3. Framework for the Conservation of Biological Diversity) constitutes a framework for biodiversity conservation at the ecosystem, species, and genetic levels.

While forest inventories have been completed, more comprehensive biodiversity inventories are not available for this region, making a thorough assessment of the nature and distribution of biodiversity difficult. The forest inventories provide a general, if somewhat dated overview, and compiled species observation records are detailed – although biased by the highly variable degree of observations across the area.

Exposed rocky shores provide excellent habitat for a variety of flora and fauna. Highly productive macroalgae are found in St. Margaret's Bay. The shores provide important spawning areas for several species of fish, including cod, pollock, haddock, and herring. Juvenile cod are found all along the coast of the study area and juvenile pollock are found in St. Margaret's Bay. Marine bird breeding colonies are scattered across the region, with a few well-recognized concentrations between Halifax and Clam Bay. Seal haulout areas are also scattered throughout the coast. Waters in the HRM are part of the migration pathway taken by humpback and blue whales to the Gulf of St. Lawrence and beyond.

LISTED SPECIES

Significant habitats of Species at Risk and Species of Concern have been identified in many portions of the area, including Porters Lake, Lake Charlotte, Governor Lake, Panuke Lake, Pockwock Lake, the Musquodoboit River, and others, but this should not be viewed as an exhaustive description of significant habitats in this highly diverse landscape. Ongoing mapping and monitoring efforts would significantly improve the effective management of the biodiversity found within the terrestrial and coastal habitats of the region.

Several species at risk are found within the region. Endangered species, including the Roseate Tern and Piping Plover use beaches within the region for breeding. Roseate Terns typically nest on small offshore islands and islets such as Fisherman's Beach, Sambro Island, and Wedge Island along the Atlantic coast of Nova Scotia. Piping Plovers nest on Martinique Beach. Local inshore populations of the Maritimes population of Atlantic cod, a species of special concern, exist along the coast, including a group that occurs within the approaches to Halifax Harbour from early fall to early winter (McCullough, et al. 2005).

The Province maintains a non-exhaustive set of 'significant habitat' data which documents notable habitats for Species at Risk and Species of Concern, moose habitat, deer over wintering areas, and other significant habitats (Map 16 and Map 17). Additionally, the Atlantic Canada Conservation Data Centre maintains a collection of point-count observations, compiled from a wide variety of sources. These records date back over a century, comprising observations of plant, animal and insect species. This report focuses on those observations which have been collected in the last 15 years, to avoid skewing the focus of the report away from the current conditions of the region. It is important to stress that this data is not the result of a rigorous survey or inventory of biodiversity across the region, and the absence of an observation should not be taken to mean the absence of biodiversity. That said, this data does provide the best available information on the distribution of biodiversity in the region, however a more thorough inventory is an important step in the wise management of biodiversity in the region. The HRM would benefit greatly from a partnership with academic research bodies, citizen-science groups, and environmental research groups, to produce a more comprehensive picture of the nature and distribution of biodiversity throughout the area.

Since 2000, a total of 18 listed Species At Risk or Species of Concern have been recorded in the ACCDC dataset (Table 4), out of a total of 212 recorded species. The relative richness of these listed species is described using a density surface as a backdrop to Map 16. Three notable hotspots of richness are observed, one east of Lake Mulgrave, one north of Lake Charlotte and south of Highway 357, and the area surrounding Cole Harbour.

Table 4. Listed species observed since 2000 in the Atlantic Canada Conservation Data Centre dataset

Taxa	Common Name	Listed Status
bird	Barn Swallow	Endangered
bird	Canada Warbler	Endangered
bird	Chimney Swift	Endangered
bird	Harlequin Duck - Eastern pop.	Endangered
bird	Piping Plover *melodus ssp*	Endangered
bird	Red Knot *rufa ssp*	Endangered
bird	Roseate Tern	Endangered
bird	Rusty Blackbird	Endangered
lichen	Boreal Felt Lichen - Atlantic pop.	Endangered
lichen	Graceful Felt Lichen	Endangered
bird	Common Nighthawk	Threatened
bird	Olive-sided Flycatcher	Threatened
bird	Whip-Poor-Will	Threatened
bird	Bobolink	Vulnerable
bird	Eastern Wood-Pewee	Vulnerable
butterfly	Eastern White Cedar	Vulnerable
lichen	Blue Felt Lichen	Vulnerable
reptile	Snapping Turtle	Vulnerable

BIRDS

The outer estuary of Musquodoboit Harbour is an Important Bird Area and a designated RAMSAR site which until recently, regularly supported the largest wintering population of American Black Duck (*Anas rubripes*) and Canada Goose (*Branta canadensis*) in eastern Canada (Smith 2012) and is considered an area of continental significance to congregating species of waterfowl (Bird Studies Canada 2015). Musquodoboit supports huge congregations of Canada Geese from the breeding population in Newfoundland and Labrador. Throughout most of the year, high numbers of geese have been recorded at this site: during spring

migration (8,000 geese representing 7% of the estimated population); during fall migration (2,000 geese about 2%); and during the winter (5,000 geese 4%). American Black Ducks are also found in Musquodoboit Harbour in winter and can number as high as 2,000 to 3,000 birds. This represents 1% of the global population of the species. These numbers are peak numbers, while typical numbers are somewhat lower. Piping Plovers (i.e., globally vulnerable, nationally endangered) have also been found at this site during the breeding season.

The Eastern Shore Islands (inshore islands located roughly between Clam Harbour and Ecum Secum) are also a designated Important Bird Area, composed of low islands, islets and reefs that are 2 to 15 km offshore. The Eastern Shore Islands support breeding congregations of greater than 4,000 common eiders (*spp. dresseri*). This represents more than 2.5% of the subspecies population. Additionally, large fall and spring congregations of eiders number more than 10,000 (approximately 2% of the total north american common eider population). Eastern population harlequin ducks (nationally endangered) are found here in the winter. As many as 50 birds, or 3.3% of the estimated eastern population of this species, winter along this coast. Other waterfowl frequent this site during spring migration. Thousands of scoters (white-winged, black, and surf) have been recorded in the vicinity of the Eastern Shore Islands. Also, leach's storm-petrels breed on some of the islands, but these colonies are largely unstudied and hence the number of birds is unknown.

FISH

Many important fish found natively in the HRM are andromous. An anadromous fish, born in fresh water, spends most of its life in the sea and returns to fresh water to spawn. Notable species include Atlantic salmon (*Salmo salar*), alewife (*Alosa pseudoharengus*), blueback herring (*Alosa aestivalis*), american eels (*Anguilla rostrata*), american shad (*Alosa sapidissima*), and rainbow smelt (*Osmerus mordax*). The Department of Fisheries and Oceans publishes information on their breeding habits (McCullough, et al. 2005).

Unfortunately, salmon stocks in this area have declined in recent years due to water quality (i.e., acidification) issues and high mortality at sea. In spawning salmon populations there are varying proportions of small (<63 cm) and large (= 63 cm) fish. In most rivers, the small salmon (called grilse) have spent one year at sea and have never before spawned. The large salmon include both previous spawners and first time spawners that have spent two or more years at sea and are called multi-sea winter fish (Department of Fisheries and Oceans 1998).

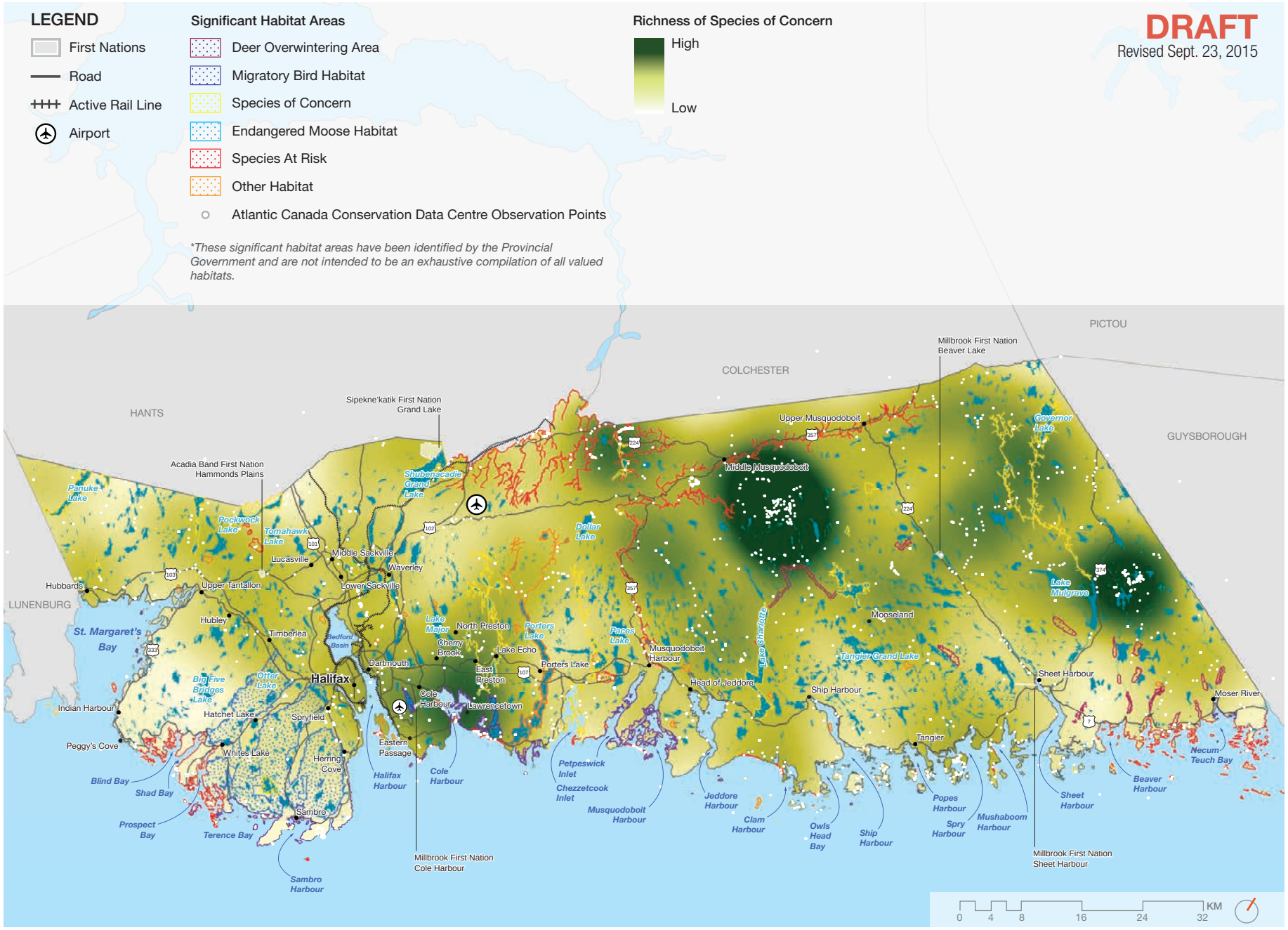
Alewife (*Alosa pseudoharengus*) and blueback herring (*Alosa aestivalis*) are anadromous fish that migrate up maritime rivers to spawn in the late spring and return to the sea soon thereafter. American eels (*Anguilla rostrata*) are found in the estuaries and rivers. American shad (*Alosa sapidissima*), an anadromous species, lives at sea and enters freshwater in spring to spawn. Other than seals and monkfish caught in weirs, American shad have few predators besides humans.

Rainbow smelt (*Osmerus mordax*) have anadromous and land-locked forms. The land-locked form is found in several freshwater lakes in Nova Scotia but has not been well documented. The anadromous form lives in coastal waters and ascends rivers in the spring to spawn. A schooling species, smelt, are often seen in large numbers in estuaries and rivers during spawning migrations. They are thought to be limited in their coastal migrations and from home to their natal rivers. In the summer, smelts move to deeper, cooler waters offshore. In the fall and late winter months, smelt move into estuaries to avoid cold waters. During the spring, spawning typically takes place at night in streams in freshwater areas above the head of tide. Spawning will occur below the head of tide, if stream obstructions bar access to upstream areas.

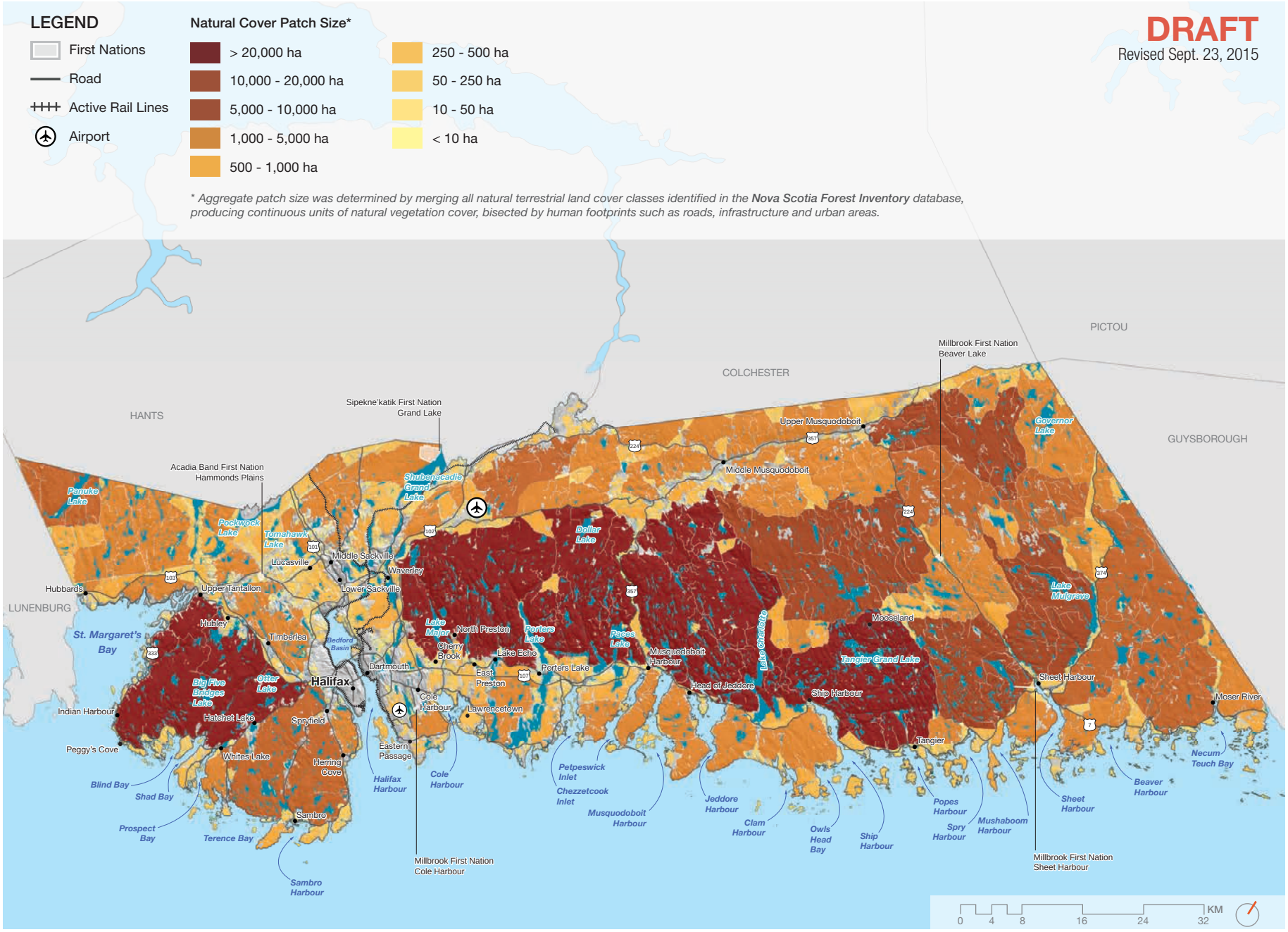
WILDLIFE

Expanding urban developments, and the growth of associated transportation networks, substantially fragment many portions of the regional landscape around the urban core, while large patches of natural cover still exist in the central and eastern portions of the region (Map 17). This has led to increasing concerns regarding the sustainability of local wildlife populations in much of the region.

Map 16. Significant Habitats



Map 17. Patch Size of Merged Natural Vegetation Cover Types



The Halifax Peninsula is highly disturbed with only remnant natural habitat still present, and expanding low-density residential development continues to encroach on the remaining natural areas which surround the urban centre of the region. As the urban area continues development, ensuring functional ecological processes within these disturbed areas must be acknowledged as an essential goal for the region; the movement of wildlife through developed areas is essential to maintain connectivity between intact natural areas. Urban parks and green streets provide shelter and may act as stepping stones for birds and other smaller creatures.

Many coastal areas, particularly the Chebucto Peninsula, have been substantially cut off from the rest of the region, partitioned by major highways and expanding communities. Increasing rural residential developments are perforating intact natural areas, leading to impacts on habitat quality for disturbance-sensitive species throughout much of the region.

Moose (*Alces alces americanus*), which are endangered provincially, occur throughout the intact forests within this region. However, recent work by the Nova Scotia Department of Natural Resources (NSDNR) suggests this area is not as critical for moose conservation efforts, as other regions of the province (Smith 2012).

3.1.1.1 Vegetation

The bulk of the region is dominated by forests, interspersed with lakes, rivers, and wetlands. When considered in an aggregate sense, large, unbroken patches of natural vegetation are found throughout the central areas of the region, while areas surrounding the major highways in the north, west, and south portions of the region see extensive fragmentation into smaller patches. Considering individual patches of vegetation cover types, few are larger in size than 16 ha; only 13 stands exceed 100 ha, found predominantly to the south and west of the City of Halifax (Map 18). A variety of disturbance regimes are found in the region, early several stages predominate in the coastal areas of the Chebucto Peninsula, infrequent fire-dominated disturbance patterns exist in sheltered bays and far inland areas, while frequent wind-fall-dominated disturbances are found in the central areas and more exposed peninsulas (Map 19). Classification of the forest cover according to the Nova Scotia Department of Natural Resources Vegetation Community Classification – Forest Model reveals a highly varied and diverse landscape, reflecting underlying biogeographic variation, natural disturbance and succession patterns, and historical forest harvest trends (Map 20).

Broad groupings of forested communities encountered region-wide are described in the following section. Key references to NSDNR's Forest Ecosystem Classification for Nova Scotia (Neily, et al. 2011) vegetation types (VT's) are provided for each broad grouping, as applicable, denoting a known or likely presence of a specific VT within the region.

(SHADE) TOLERANT HARDWOOD FOREST

This vegetation type is common on moderately-well to well drained sites on moderately-rich to rich soils. Late successional species, such as sugar maple (*Acer saccharum*), yellow birch (*Betula alleghaniensis*) and red oak (*Quercus rubra*) are the most common species. Smaller trees and shrubs, such as beech (*Fagus grandifoilia*), striped maple (*Acer pennsylvanicum*) are widespread in the understorey. Ferns often comprise a major understorey component, and include New York fern (*Thelypteris noveboracensis*), evergreen wood fern (*Dryopteris intermedia*), northern beech fern (*Phegopteris connectilis*), and hay-scented fern (*Dennstaedtia punctilobula*). Commonly encountered herb species include wild lily-of-the-valley (*Maianthemum canadense*), bunchberry (*Cornus canadensis*), wood sorrel (*Oxalis acetosella*), sarsaparilla (*Aralia nudicaulis*), goldthread (*Coptis trifolia*), rose twisted stalk (*Streptopus rosues*), Indian cucumber root (*Medeola virginiana*), drooping wood sedge (*Carex arctata*), and wood aster (*Oclemena acuminata*). It is rare to have stand replacing disturbance in this forest type, instead, it regenerates itself through gap level disturbances like individual tree mortality or weather damage; gap dynamics can eventually transform this vegetation types into uneven-aged, old growth forests. The nutrient rich soils promote the growth of many rare plant species in Nova Scotia. [NSDNR Reference VT's:TH1, TH2, TH3, TH4, TH7, TH8]

(SHADE) INTOLERANT HARDWOOD FOREST

Intolerant hardwoods are an early to mid-successional group comprising predominantly even-aged, short lived species such as red maple (*Acer rubrum*), aspen (*Populus spp.*), grey birch (*Betula populifolia*), and white birch (*Betula papyrifera*). These forests can occupy a variety of nutrient and moisture regimes, and originate primarily from stand-level disturbances over relatively large areas, such as forest fire or clearcut harvesting. White birch and red maple are the most common overstorey trees, with occasional balsam fir (*Abies balksamea*), red and white spruce (*Picea rubens* and *P. glauca*), white pine (*Pinus strobus*), red oak, and yellow birch. The typically well-developed shrub layer often comprises wild raisin (*Viburnum nudum*), serviceberry (*Amelanchier spp.*), sheep laurel (*Kalmia angustifolia*), blueberry (*Vaccinium angustifolium*), striped maple, and various species of tree regeneration. Herbaceous layer components commonly include bracken fern (*Pteridium aquilinum*), sarsaparilla, starflower (*Trientalis borealis*), bunchberry, and minor amounts of bryophytes.

SPRUCE-HEMLOCK FOREST

This forest group can be rather variable, depending upon the combination of nutrient and moisture regimes on a site specific level. Spruce – hemlock vegetation communities are considered to be a mid to late successional group with red spruce, white pine, and eastern hemlock (*Tsuga canadensis*) being the most predominant species. Balsam fir is a common species in the earlier stages of development. As these community types mature, there will be a progression from even aged to uneven aged, due to the long life expectancy of spruce, eastern hemlock, and eastern white pine and the sporadic occurrence of stand level disturbances (i.e., clearcutting, forest fires). The herbaceous component of these communities is often sparse, with the understorey being dominated primarily by mosses.

SPRUCE-PINE FOREST

The spruce-pine vegetation types, which consist mainly of black spruce, eastern white pine, red pine, and jack pine (*Pinus banksiana*), are dependent on wildfire disturbances. All of these tree species, except for eastern white pine, have either semi-serotinous or serotinous cones which require heat to open and disperse seeds for regeneration. Due to the acidic nature of the soils, the shrub and ground vegetation layers are dominated by ericaceous species such as sheep laurel, blueberry, and bracken fern. These vegetation types are typically early to mid-successional and can be even aged or uneven aged depending on the severity of fire disturbances.

WET CONIFEROUS FOREST

The wet coniferous groups develop in areas with very high water tables either with near surface, or surface water present. Black spruce (*Picea mariana*), tamarack, and balsam fir are the most common species in these vegetation types. Vegetation in the shrub and herb layer is often ericaceous species with high tolerances with water and poor soils. The cool, moist conifer forests contain numerous populations of three listed cyanolichen species – boreal felt lichen (*Erioderma pedicellatum*) vole ears lichen (*Erioderma mollisimum*) and blue felt lichen (*Degelia plumbea*) as well as several other rare lichens and bryophytes (Environment Canada 2007). Typical herbaceous species include cinnamon fern (*Osmunda cinnamomea*), snowberry (*Gaultheria hispidula*), and various sedges.

WET DECIDUOUS FOREST

These forests develop in areas with very high water tables, either with near surface, or surface water present. Common species include red maple, white ash, and occasional balsam fir, tamarack (*Larix laricina*), and black spruce. The shrub layer is often defined by regenerating tree species, speckled alder, wild raisin, and sheep laurel. The herbaceous layer is defined by the presence of many ferns (most notably cinnamon fern) and sedges. The nutrient availability varies between moderate to high, with white ash being an indicator of high nutrient values.

OLD-FIELD FOREST

These develop after the abandonment of old farmland and therefore the soil tends to be rich in organics. The vegetation is composed mostly of early successional softwood species. The structure usually consists of a dense overstorey of species such as white spruce, tamarack, white pine, balsam fir, and occasionally aspens, red oak, and white ash (*Fraxinus americana*). It has a very patchy, but diverse shrub and herb layer. Mosses, such as schrebers moss (*Pleurozium schreberii*) and mycorrhizal mushrooms, are very common under the dense canopy cover of the overstorey.

COASTAL FOREST

These forest groups are only found in the Atlantic Coastal ecoregion, and are a product of the cool, moist climate associated with these areas. Black spruce, white spruce, and balsam fir are the most common species in the overstorey, with occasional occurrences of red maple and white birch. Common shrub species include heart-leaf birch (*Betula cordifolia*), mountain ash (*Sorbus americana*), downy alder (*Alnus crispa*), bayberry (*Morella pennsylvanica*), and foxberry (*Vaccinium vitus-idaea*).

OPEN WOODLAND

These areas typically comprise less than 30% canopy cover on average, as a result of a number of growth-limiting factors include thin soil, low fertility, low moisture, and exposed bedrock. The balance of cover is composed of reindeer lichens (*Cladina spp.*) and a variety of (predominantly ericaceous) shrubs, including blueberry, black huckleberry (*Gaylussacia baccata*), sheep laurel, rhodora (*Rhododendron canadense*), and black crowberry (*Empetrum nigrum*).

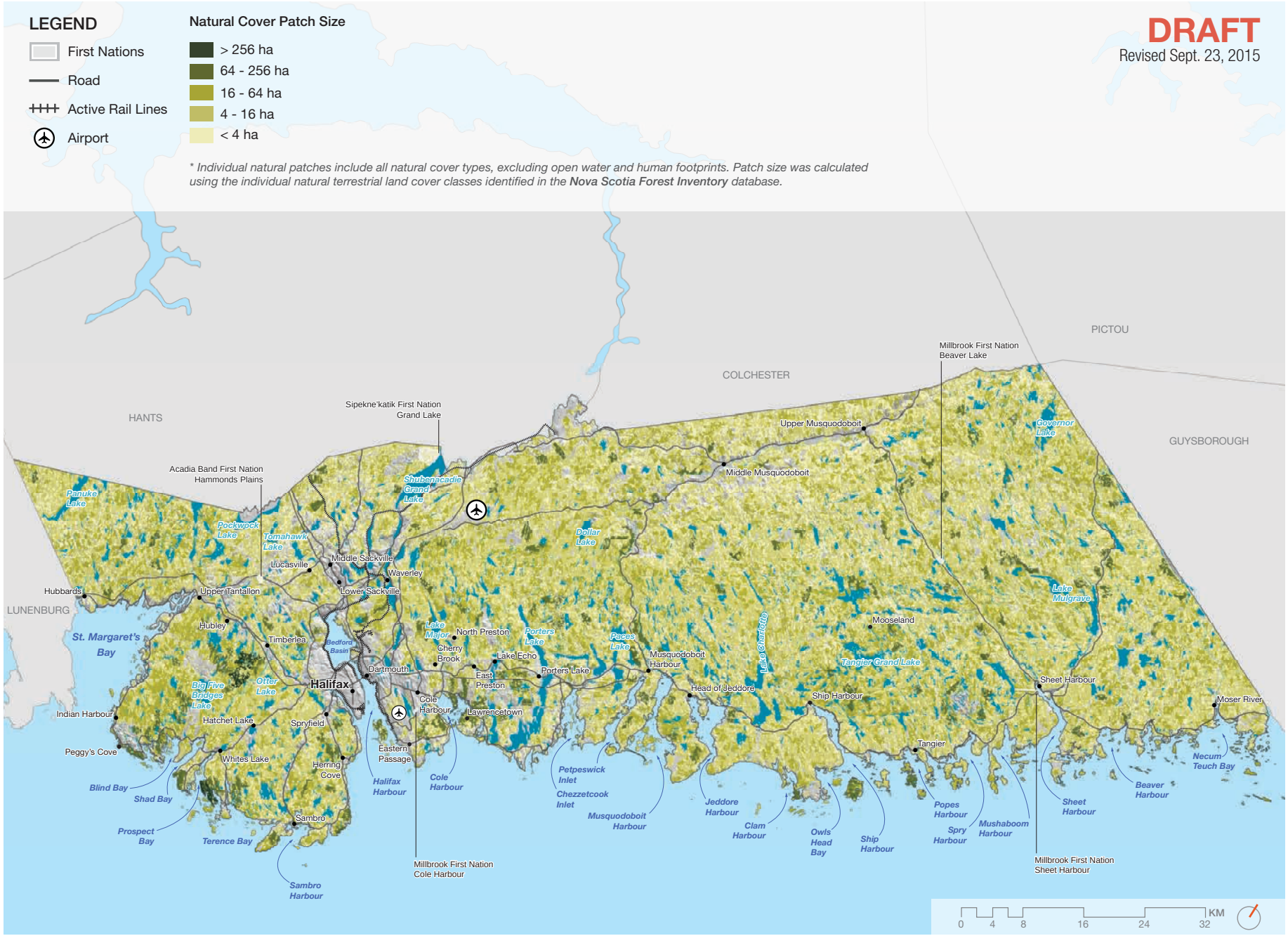
Of note amongst this grouping are the globally rare jack pine/broom crowberry barrens that are found in the Purcells Cove Backlands. These consist of the signature jack pines growing among large whaleback– shaped granite outcrops, along with the low-growing broom crowberry (*Corema conradii*), bearberry (*Arctostaphylos uva-ursi*), common juniper (*Juniperus communus*), and black huckleberry.

3.1.1.2 Landscape Connectivity and Fragmentation

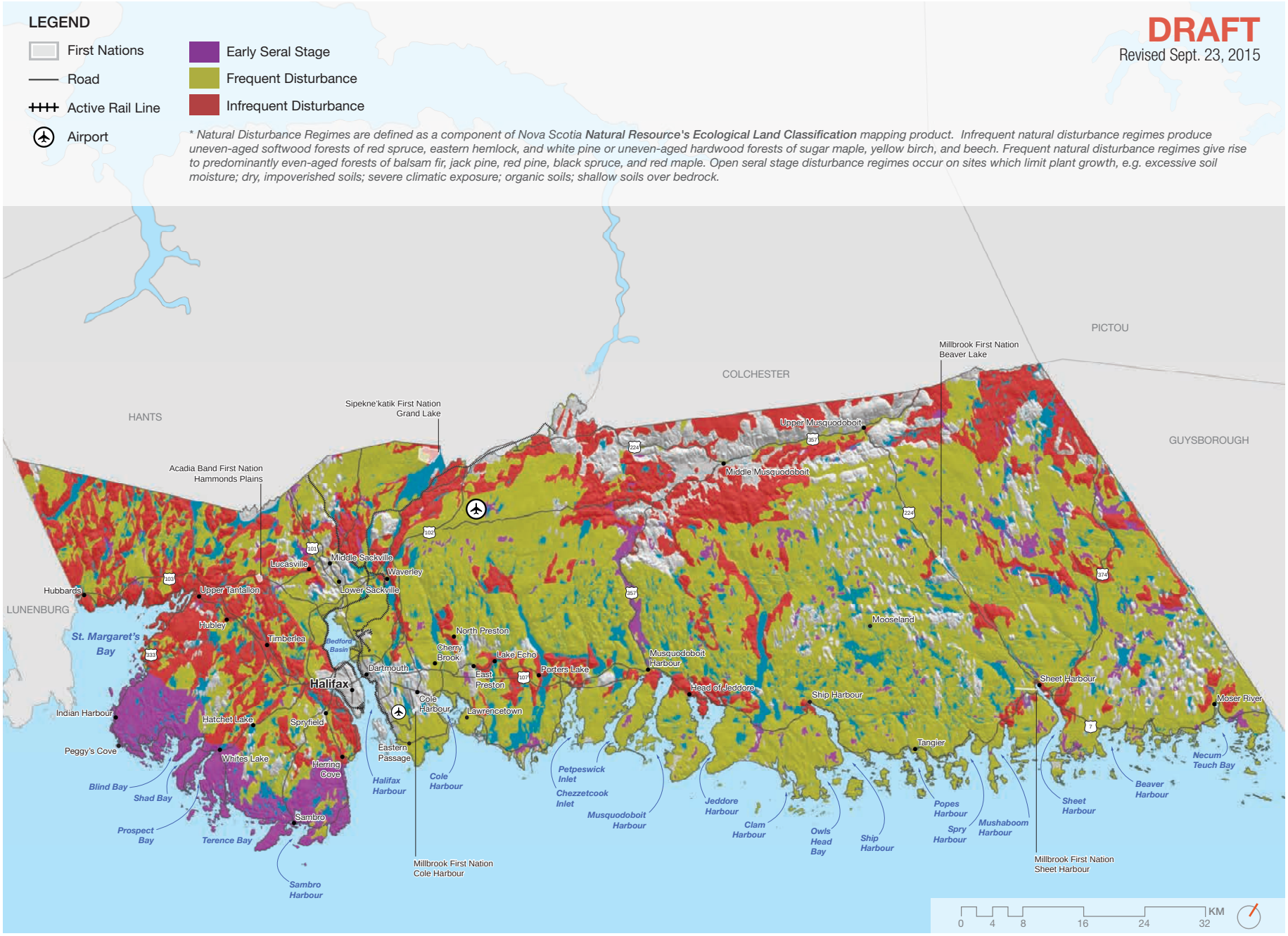
Landscape Connectivity was estimated with the Circuitscape model (McRae and Shaw 2015) that uses a similar methodology as the Nature Conservancy in their assessment of landscape resiliency for the Northeast and Mid-Atlantic Region of North America (Anderson, et al. 2006). The model estimates the likelihood of wildlife movement through the landscape, in response to 'landscape friction', or difficulty in moving across the land. Friction values are estimated using land cover and terrain (Map 21). Undisturbed natural vegetation cover receives the lowest values, wetlands and disturbed vegetation receive moderate values, and open water and urban areas receive high values. Buildings and roads receive the highest values. Steeply sloped areas receive higher friction values than flat areas (Map 21).

The model outputs show the relative likelihood of wildlife movement through the land (Map 22). Areas in the west of the region where there are extensive human impacts and many road corridors there are also many pinch-points. In these places, movement of wildlife is restricted and funneled into more narrowed corridors. Areas in the east of the region show a much different pattern

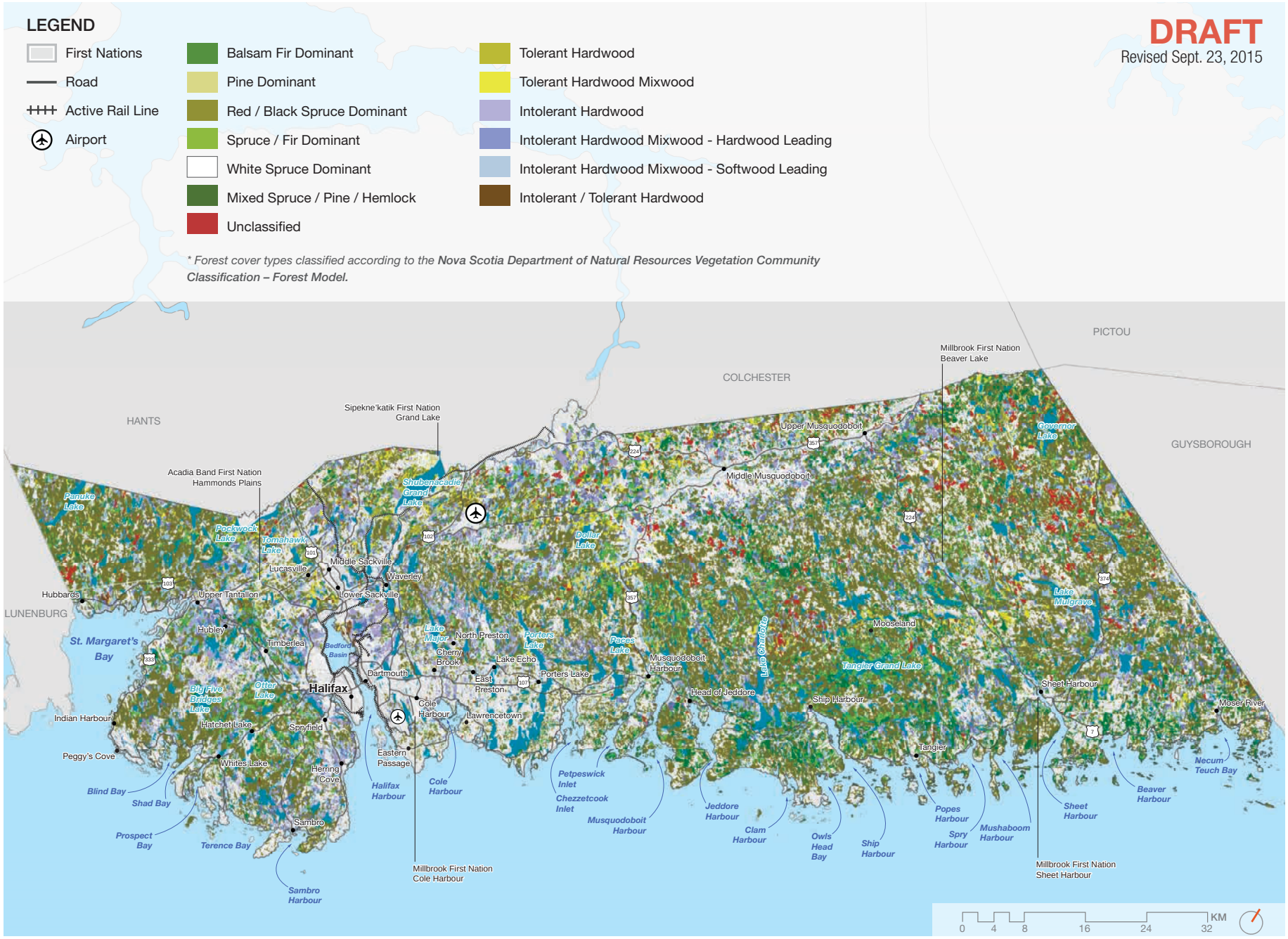
Map 18. Patch Size of Individual Natural Vegetation Cover Types



Map 19. Natural Disturbance Regime



Map 20. Forest Classification



characterized by more diffuse movement through the relatively undisturbed natural habitats. These areas are associated with fewer pinch points and more paths through the landscape. The large number of lakes and open-water wetlands provide natural restrictions to movement and natural corridors emerge throughout the rolling terrain of the area. However, in areas with extensive development, the limited options for movement tend to result in a greater concentration of wildlife movement in some areas as the number of options for movement become restricted.

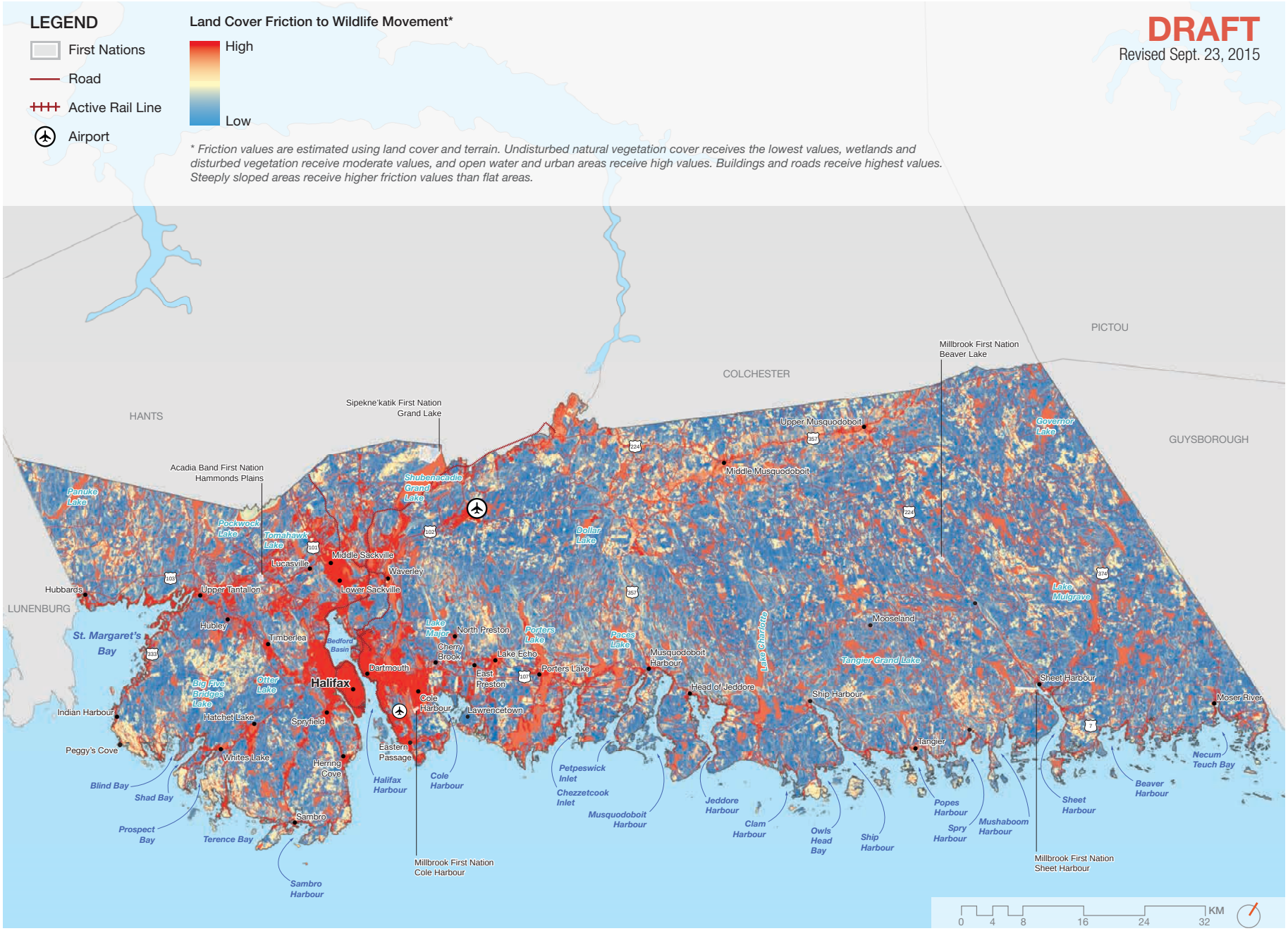
Model outputs are further generalized using a 100 m moving window average within GIS, to highlight areas with greater likelihood of wildlife movement (Map 23. Generalized Landscape Connectivity). This helps to identify broad corridors of movement.

Highlighting the areas with the highest density of movement allows the identification of notable landscape pinch-points. These pinch-point areas have been further smoothed and buffered to identify areas where wildlife movement should be a high priority. These high density areas occur in areas which are influenced by high friction land cover types, such as roads, urban development large open water areas and steep slopes. Pinch points form when wildlife movement is restricted, funneling movement through specific corridors in the landscape. In areas dominated by natural terrestrial vegetation there is less friction, and movement paths take on a more diffuse pattern, with fewer pinch points, and many more options for moving across the landscape. Major road corridors bisecting these natural areas will tend to see non-localized wildlife crossing events, while road corridors near development areas may see crossing events focused in particular areas. Pinch points identify areas, where the remaining natural cover plays an essential role in maintaining connectivity across the landscape. Developments in these areas will have a disproportionate effect on regional connectivity, and should be conducted using best practices to ensure that wildlife movement is maintained or bolstered (Map 24).

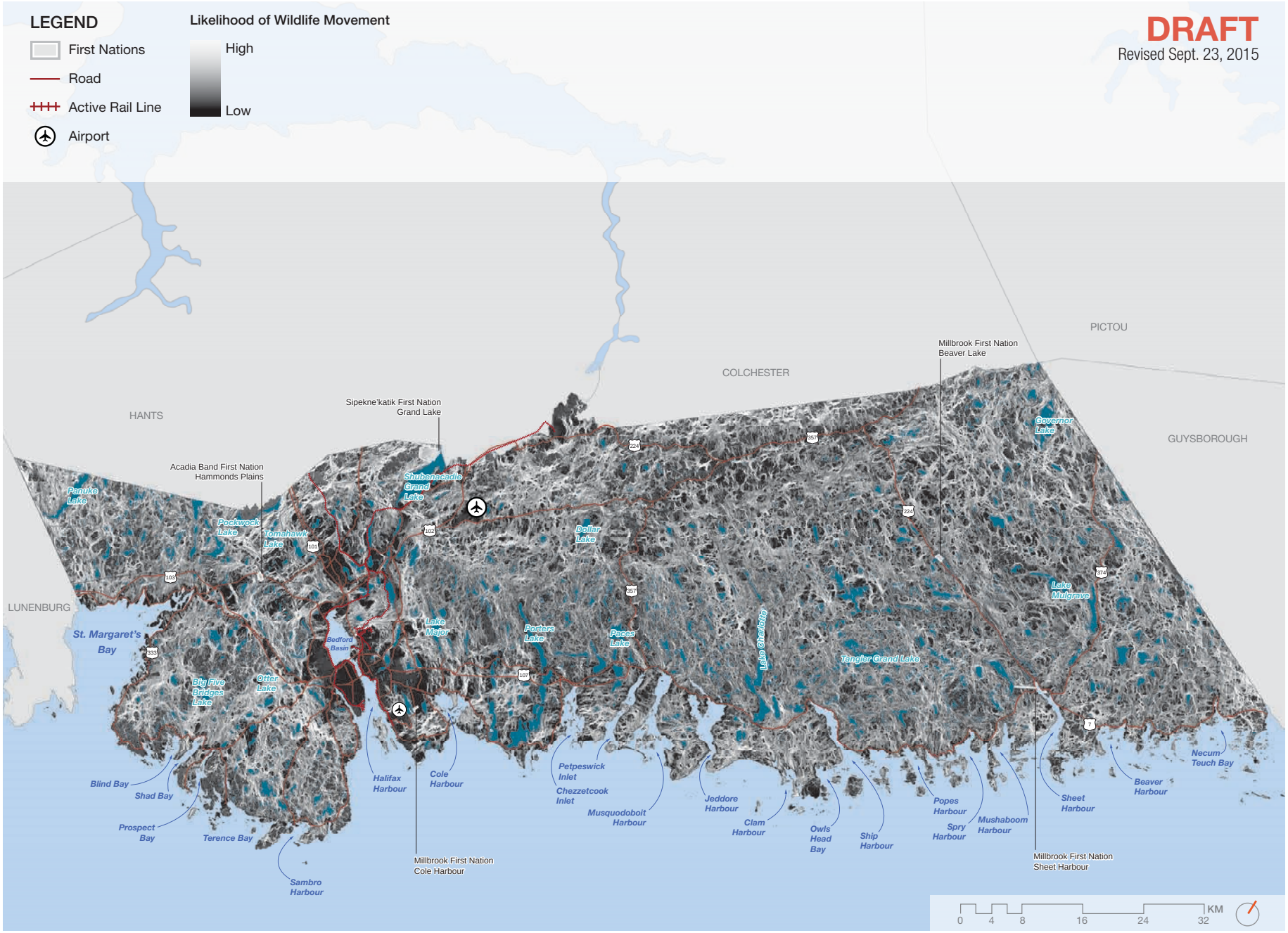
Notable pinch points and corridors include:

- the southern portion of the Backlands;
- the area south and east of Big Five Bridges Lake;
- the area surrounding and south of Otter Lake;
- the area west of the City of Halifax;
- the area west of Shubenacadie Grand Lake stretching south to Tomahawk Lake;
- the area north of the Musquodoboit River;
- the area east of the Bedford Basin, connecting to the west of Lake Major;
- the eastern North-South axis stretching running parallel to the east of the highway 224;
- most of the coastal peninsulas contain pinch points south of the highway;
- areas surrounding Birch Cove lakes; and
- Otter Lake to Long Lake.

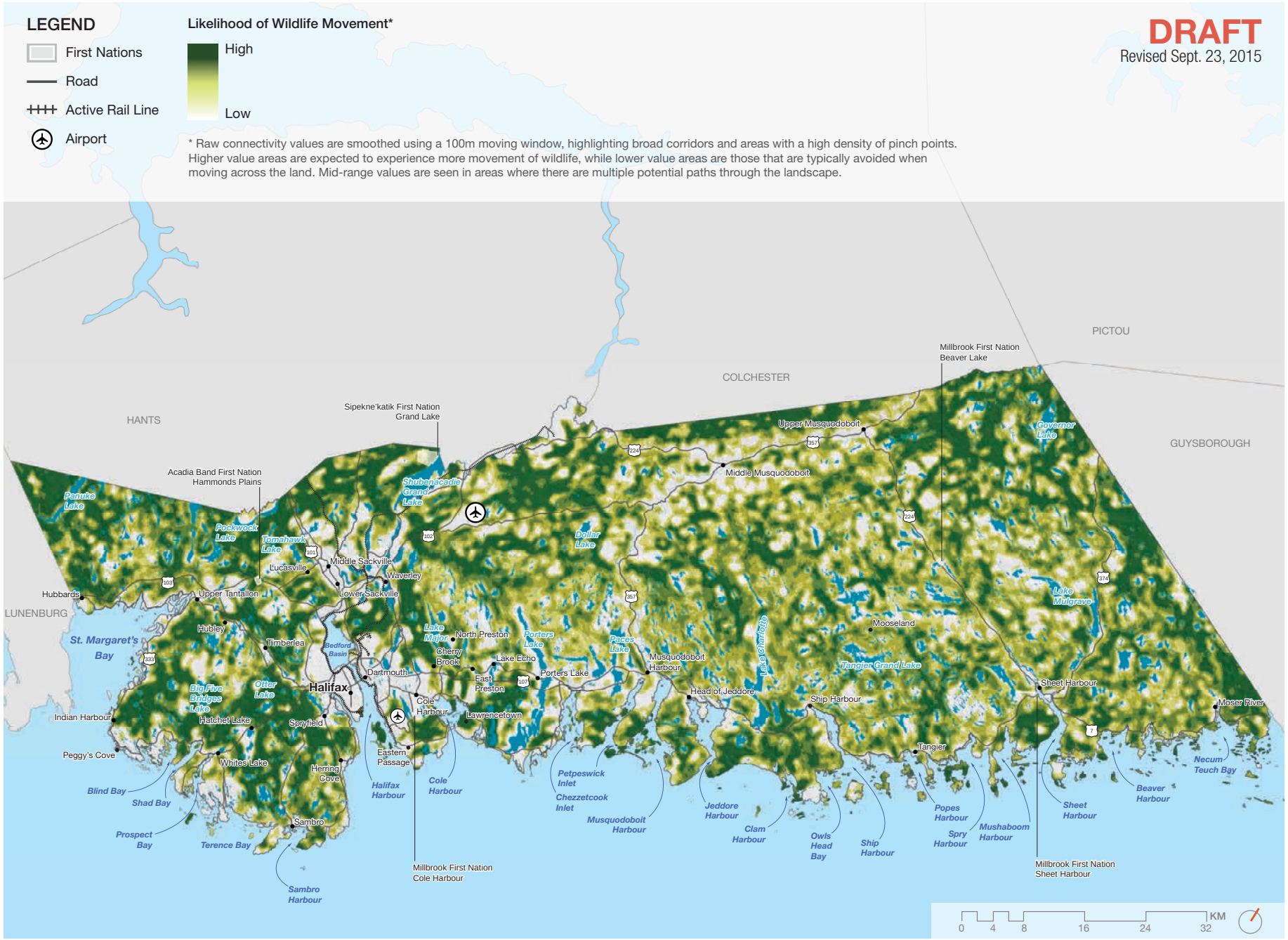
Map 21. Land Cover Friction to Wildlife Movement



Map 22. Landscape Connectivity



Map 23. Generalized Landscape Connectivity



Map 24. Landscape Pinch Points to Wildlife Movement

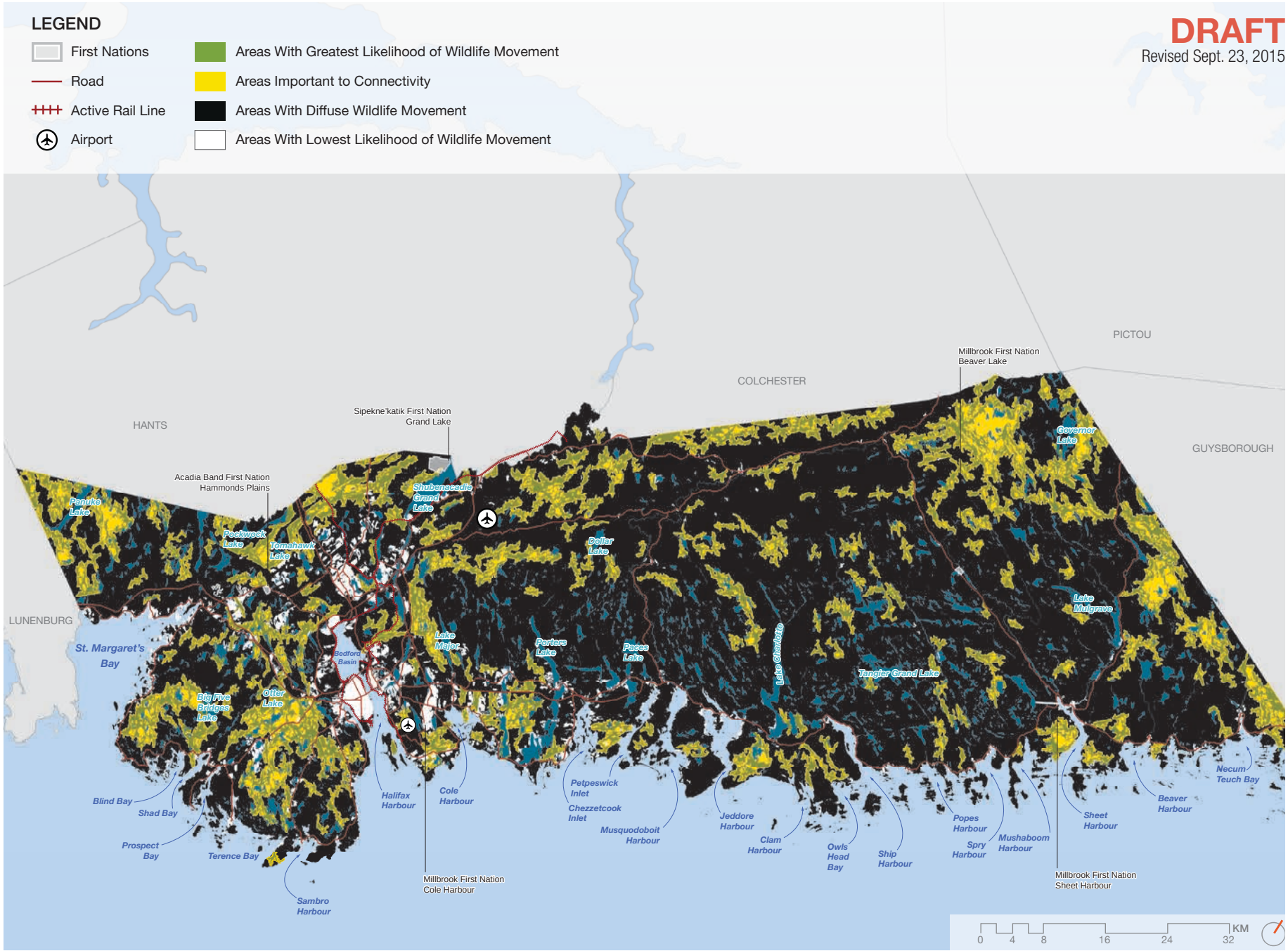


Table 5. Land cover friction values used for Connectivity analysis

LAND COVER	FRICTION SCORE
Blueberries	5
Coastal habitat	5
Forest - Dead	5
Forest - Dead 1	5
Forest - Dead 2	5
Forest - Natural Island	5
Forest - Sugar Bush	5
Forest - Wind throw	5
Forest -Alders <75%	5
Forest -Alders >75%	5
Forest -Brush	5
Forest -Burn	5
Forest -Partial depletion non verified	5
Barren	40
Beach	40
Cliffs, dunes, coastal rocks	40
Forest - Christmas Trees	40
Forest - Old field	40
Forest -Clear Cut	40
Forest -Partial depletion	40
Forest -Plantation	40
Forest -Treated Stand	40
Rock barren	40
Treed bogs	50
Wetlands general	50
Agriculture	60
Misc.	60
Pipeline corridor	60
Powerline corridor	60
Beaver flowage	70
Inland water	70
Lake wetland	70
Open bogs	70
Urban	80
Rail Corridor	90
Sanitary land fill	90
Building	100
Gravel pit	100
Road corridor	100
Ocean	500

3.1.2 Surficial Geology, Landforms and Soils

KEY ISSUES

- Shallow, fragile soils in many areas are susceptible to erosion.
- Development on granite bedrock is economically challenging. Extensive blasting is required, which may impact integrity of ecosystems and requires removal of existing forest cover.
- Development pressure on prime agricultural soils.

KEY OPPORTUNITIES

- Conservation of prime agricultural land through zoning, programs, and incentives.
- Protection of special landforms such as whaleback granite outcrops, drumlins, and boulders.
- Protection of intact, shallow soils from erosion.

GENERAL DISCUSSION

The geology of the HRM varies extensively, due to the glacial effects, coastal influences, and historical vegetation cover. The soils found in the HRM have developed almost entirely from glacial drift. Granite, slate, and quartzite bedrock underlies much of the HRM (Map 25). Exposed rocky bedrock occurs throughout much of the region, interspersed with eroded valleys and low-lying wet areas. Some HRM residents believe that development should be avoided in these areas because construction on bedrock is more costly, and the extensive required blasting that can impact the integrity of surrounding ecosystems. Development costs tend to increase when extensive blasting of bedrock is required.

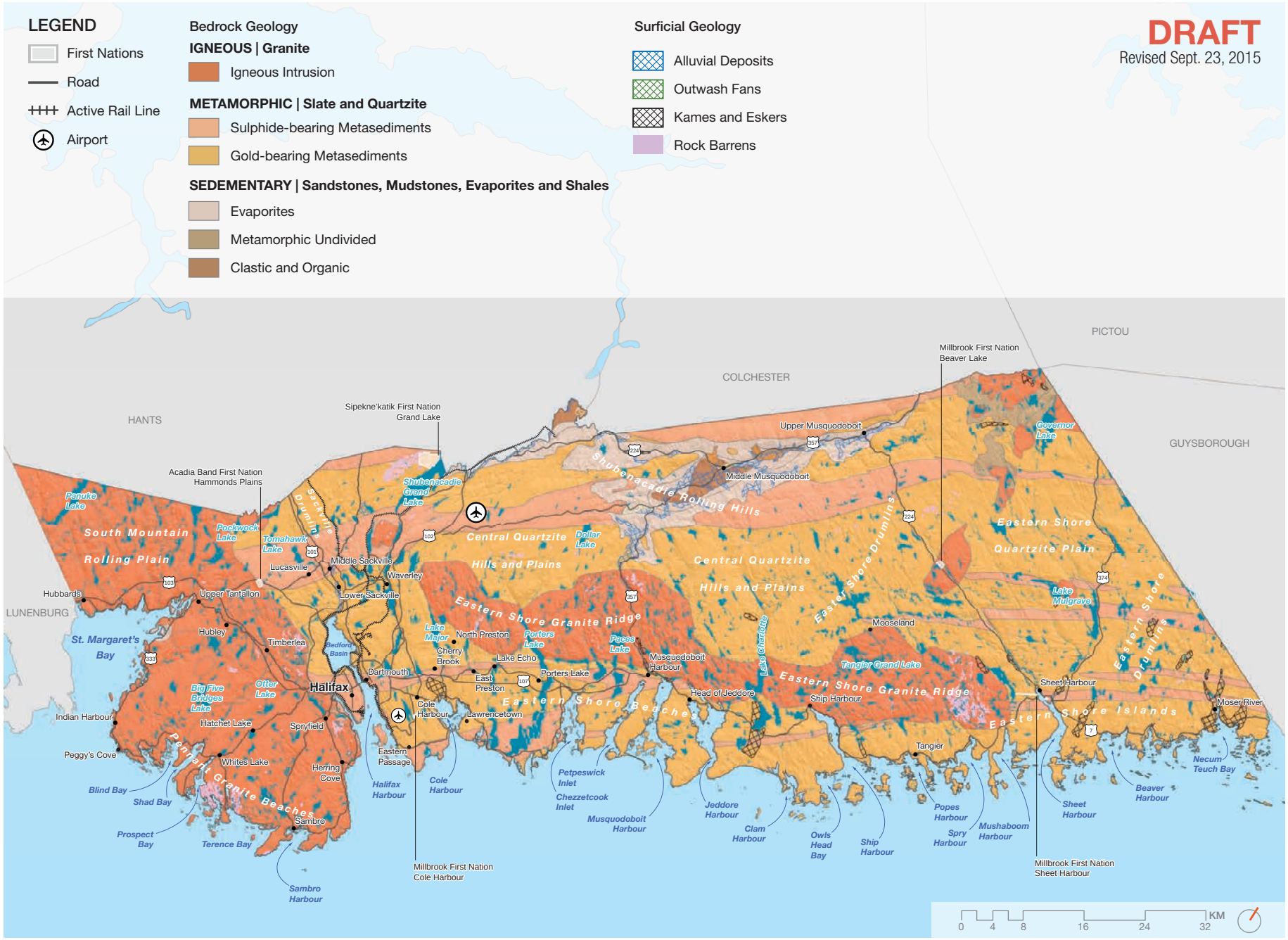
Granite bedrock landforms contribute to the unique character and beauty of the landscape. Areas with special geological features and landforms such as whaleback granite outcrops and huge boulders contribute to a unique sense of place throughout the region. Granite bedrock is common throughout the Chebucto Peninsula, Timberlea, and Mainland South where extensive development has taken place and continues to this day. Other current examples include Brunello Estates in Timberlea, the Bayers Lake Park expansion, and development in the vicinity of the Purcell's Cove backlands.

Finer textured materials that were eroded over time by the movement of the ice sheet accumulated in deep deposits, often in the form of drumlins or drumlin-like mound landforms. Many drumlins exist near Dartmouth and along the coastal area east of Halifax.

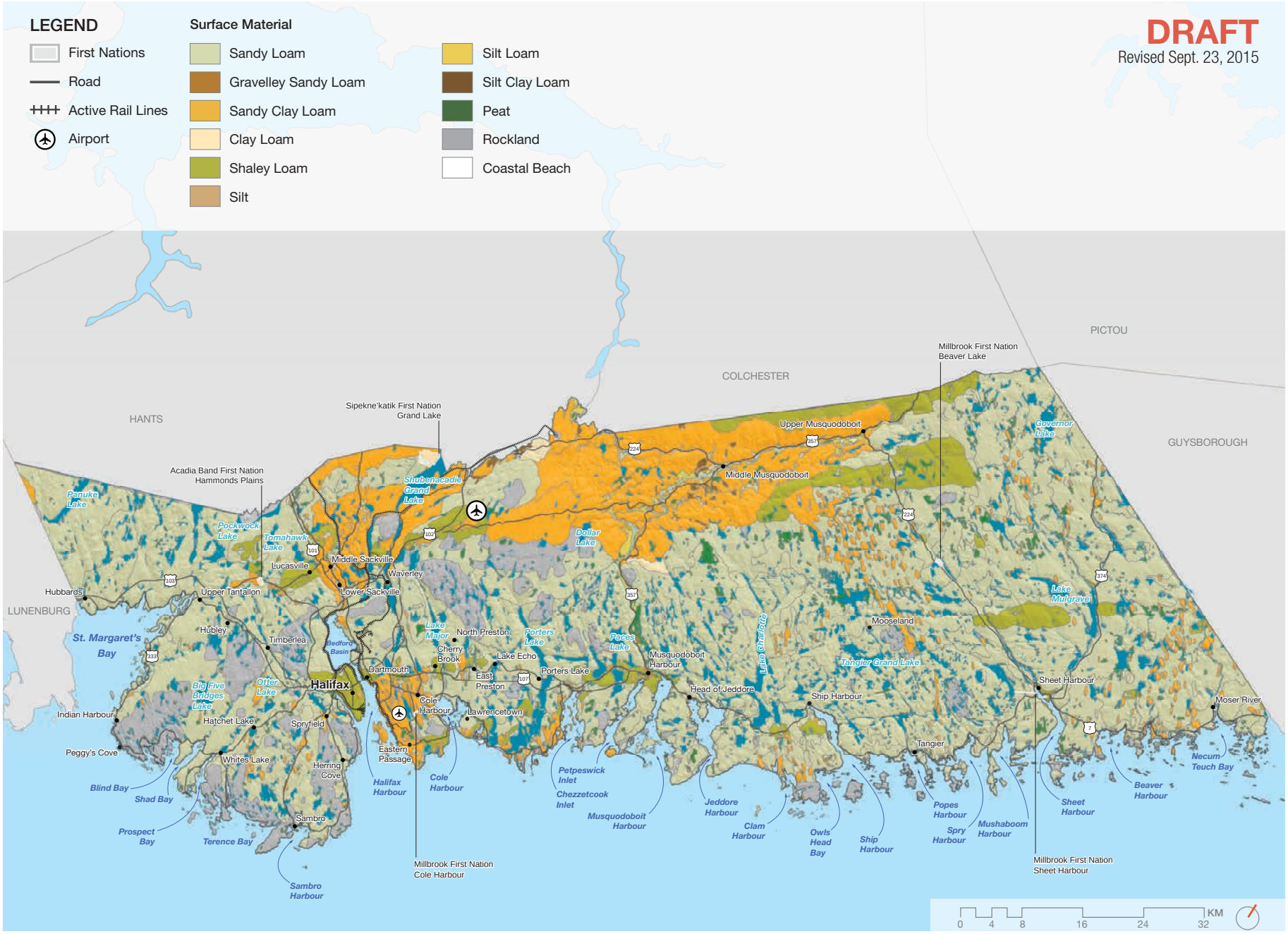
In the Musquodoboit Valley, the parent material is moderately fine textured and the soil ranges from sandy loam to sandy clay loam. The material is derived chiefly from sandstone, mudstones, and shales of the Carboniferous age. The material is usually fairly deep, moderately permeable, and contains less stone than other parent materials. Soils formed from this material are important agriculturally, since they are stone free and fairly fertile (MacDougall, Cann and Hilchey 1963). Owing to this history, the soils of the Musquodoboit Valley are the most agriculturally productive soils in the region (Map 26). It is important that the soils of this area be prioritized for agricultural use through the use of zoning and other programs or incentives.

Elsewhere in the region, soils are shallow in some areas and at risk of erosion. In these areas, incautious development activity could increase the risk of degradation. The HGNP provides the opportunity to protect and celebrate the unique geology and landforms of the HRM, while conserving prime agricultural soils and protecting thin fragile soils from erosion.

Map 25. Landforms and Geology



Map 26. Soils


LEGEND
First Nations
Road
Active Rail Lines
Airport
Surface Material
Sandy Loam
Gravelley Sandy Loam
Sandy Clay Loam
Clay Loam
Shaley Loam
Silt
Silt Loam
Silt Clay Loam
Peat
Rockland
Coastal Beach
DRAFT
Revised Sept. 23, 2015
HANTS
COLCHESTER
PICTOU
GUYSBOROUGH
LUNENBURG
Millbrook First Nation
Beaver Lake
Sipekne'katik First Nation
Grand Lake
Acadia Band First Nation
Hammonds Plains
Upper Musquodoboit
Middle Musquodoboit
Governor Lake
Panuke Lake
Pockwock Lake
Tomahawk Lake
Shubenacadie Grand Lake
Dollar Lake
Lucasville
Middle Sackville
Waverley
Lower Sackville
Hubbards
Upper Tantallon
Hubley
Timberlea
St. Margaret's Bay
Bedford Basin
Lake Major
North Preston
Cherry Brook
Lake Echo
Porters Lake
East Preston
Dartmouth
Halifax
Otter Lake
Big Five Bridges Lake
Indian Harbour
Hatchet Lake
Spryfield
Peggy's Cove
Whites Lake
Herring Cove
Eastern Passage
Cole Harbour
Lawrencetown
Sambro
Prospect Bay
Terence Bay
Blind Bay
Shad Bay
Sambro Harbour
Halifax Harbour
Cole Harbour
Millbrook First Nation
Cole Harbour
Petpeswick Inlet
Chezzetcook Inlet
Musquodoboit Harbour
Porters Lake
Paces Lake
Musquodoboit Harbour
Head of Jeddore
Jeddore Harbour
Clam Harbour
Owls Head Bay
Ship Harbour
Lake Charlotte
Mooseland
Tangier Grand Lake
Ship Harbour
Tangier
Popes Harbour
Spry Harbour
Mushaboom Harbour
Sheet Harbour
Millbrook First Nation
Sheet Harbour
Lake Mulgrave
Sheet Harbour
Moser River
Necum Teuch Bay
Beaver Harbour
0 4 8 16 24 32 KM

3.1.3 Inland and Coastal Waters

3.1.3.1 Watersheds

KEY ISSUES

- Expanding development may impact existing source water protection areas.
- Heavily developed watersheds face extensive runoff and contamination issues.
- Watersheds on the periphery of the region require collaboration with other jurisdictions.

KEY OPPORTUNITIES

- Active and concerned watershed stewardship groups provide ample opportunities for public collaboration.
- The Sackville, Musquodoboit, and Tangier watersheds fall predominantly within the HRM, thereby minimizing the jurisdictional challenges of water quality management in these drainage basins.
- The Tangier watershed in particular is has relatively few residential developments and most of the drainage area remains free of impervious surfaces.
- The NSLC Adopt-A-Stream program provides funding and an opportunity for collaboration between a wide variety of stakeholders.

Safe, high quality water is important for service-based industries that make up 75% of Nova Scotia's gross domestic product (Province of Nova Scotia 2010). Resource-based industries such as forestry, agriculture, and fisheries require a healthy environment in which water plays an essential role. Other industries also need adequate access to water for industrial processes. These include heating and cooling, materials extraction, waste disposal, food processing, and energy generation. Large water users are defined by the regulatory requirement that anyone withdrawing more than 23,000 litres of water a day needs to apply for approval to do so. This applies to both surface water and groundwater.

Transportation and Infrastructure Renewal has been working to restore tidal flows to estuaries when constructing new roads and performing general maintenance. Cheverie Creek and Dykelands in St. Croix are successful examples of this restoration work.

The Nova Scotia Salmon Association and the Nova Scotia Liquor Corporation (NSLC) have struck a unique partnership to help fund the protection and restoration of local watersheds to improve water quality and aquatic habitat. The NSLC Adopt-A-Stream program will benefit from a 5-year commitment of $500,000 to fund stream, river, and headwater projects across the province.

The three watersheds of the Sackville, Musquodoboit, and Tangier rivers are located largely within the HRM. The four watersheds of the St. Croix, Shubenacadie, East/West River Sheet Harbour, and Liscombe River have substantial portions overlapping with the HRM. Two other watersheds have a small overlap with the HRM: the Avon and St. Mary's rivers (Map 27).

Five watersheds in the HRM have been identified (Sterling, et al. 2014) as under the highest threat (a combination of hydrologic change, surface erosion, water quality, and instream habitat; Figure 3):

1. Dartmouth Lakes (17 km^2)
2. Cow Bay (30 km^2)
3. Kearney Run (35 km^2)
4. Sackville (151 km^2)
5. Sackville Residual(278 km^2)

Important/sensitive sub-basins or areas of concern expressed by public outreach include:

- Dollar Lake
- Purcell's Pond
- Chebucto Peninsula
- Long Lake
- Sryfield
- Sandy Lake (important for the Sackville River)
- McIntosh Run is an urban watershed that still exists in a relatively undisturbed state
- Jack Pine
- Scraggy Lake polluted by adjacent tailing ponds / gold mines

Map 27. Watersheds

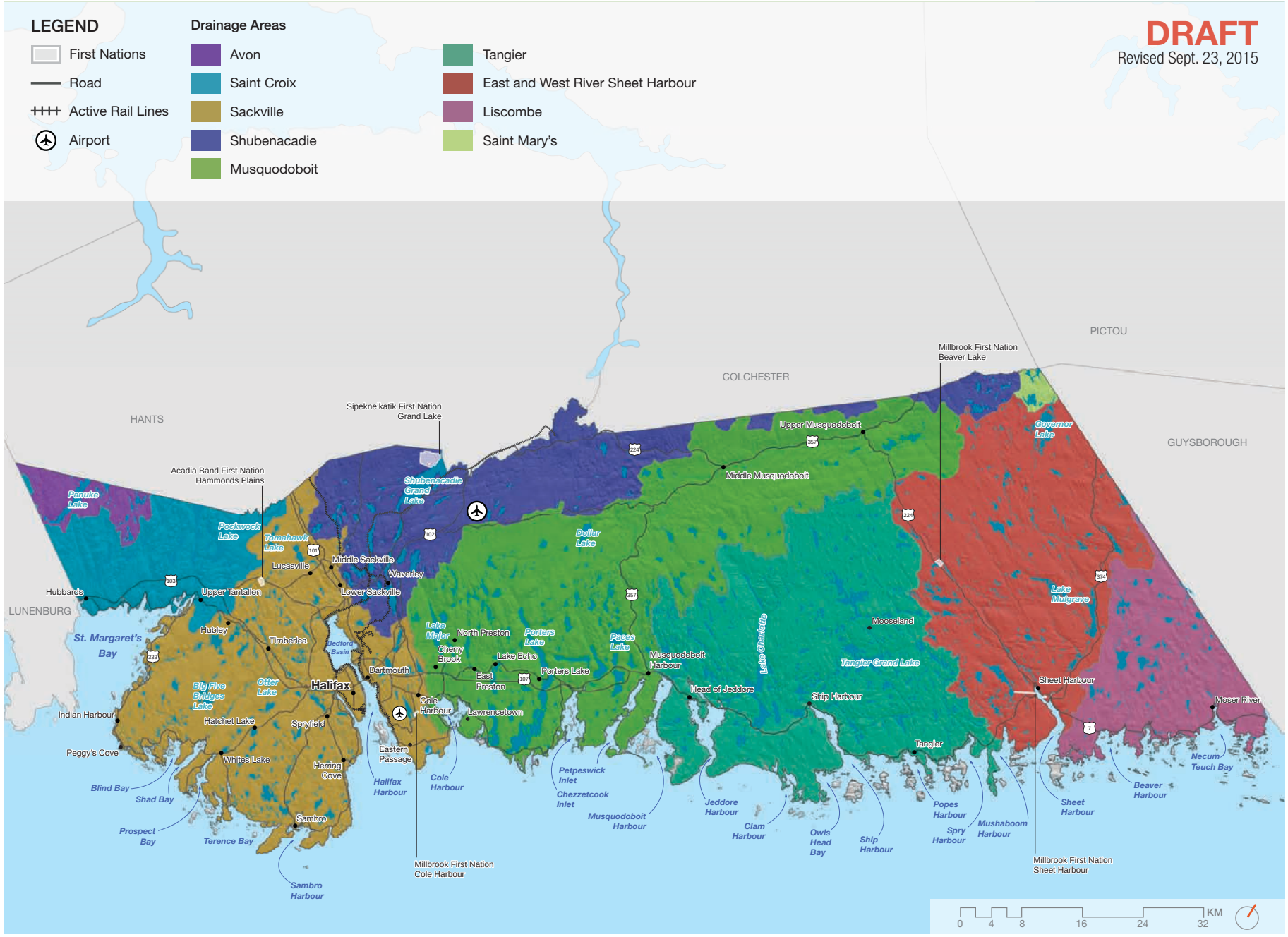
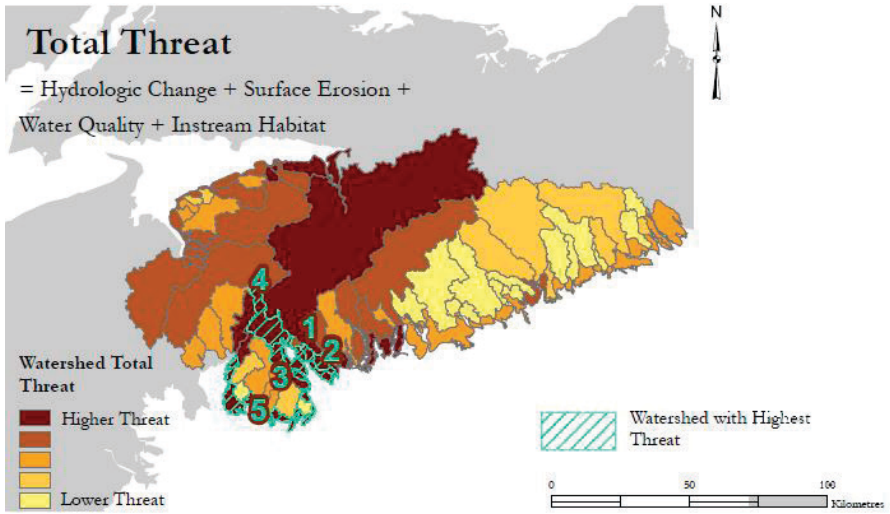


Figure 3. Watersheds in the Central Region with Highest Threat (from Sterling et al. 2014)



3.1.3.2 Potable Source Water

KEY ISSUES

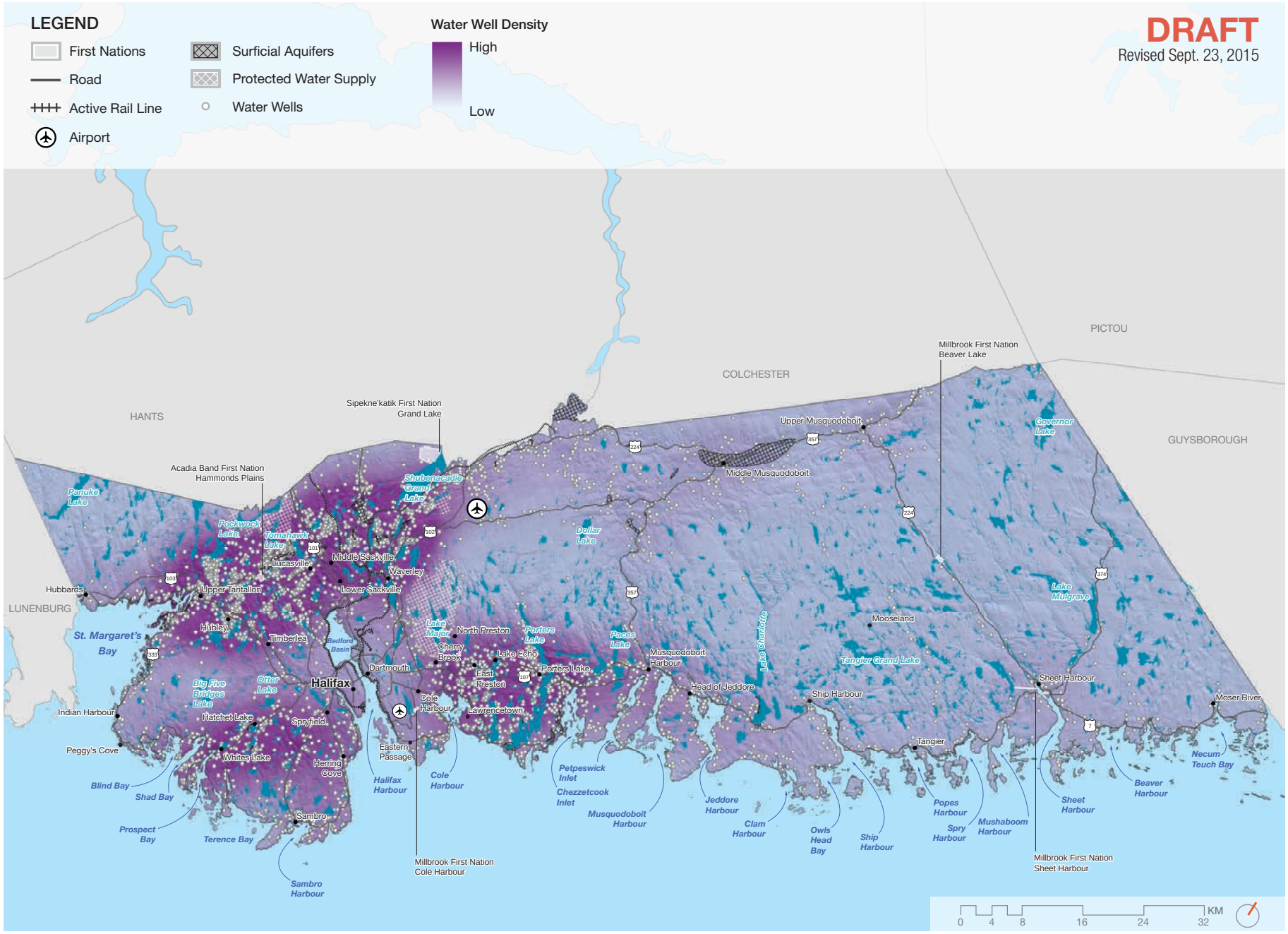
- Potable water supply is a concern throughout the region as many communities are reliant on local wells and septic systems, especially in the areas north of the City of Halifax. Concerns are focused around three major centres of development, the first stretching from Upper Tantallon towards Middle Sackville, the second around the middle-south portions of the Chebucto Peninsula, and the third east of Cole Harbour. Wells are found throughout the entire region, with the greatest density occurring west of Musquodoboit Harbour.
- With many wells drawing from the groundwater, contamination is a chief issue. Factors include leaching of arsenic from the bedrock, agricultural runoff in the Musquodoboit Valley, and urban and industrial runoff into lakes, streams, and associated riparian areas.
- Arsenic contamination from bedrock is a concern throughout much of the region.
- Sewage outfalls and failing septic systems pose ongoing challenges.
- Over extraction of groundwater is also lowering the water table in some areas and increasing the possibility of salt water intrusion along the shoreline.

KEY OPPORTUNITIES

- Ongoing development of new communities provides an opportunity to develop new approaches to water management.
- Local concerns regarding groundwater contamination increase public pressure to retrofit substandard septic systems in existing communities.

The fractured bedrock aquifers supplying the greater Halifax area have limited water supply capacity and are experiencing groundwater stress due to extensive residential growth. Households located in unserviced areas of the HRM are

Map 28. Potable Source Water



typically supplied by drilled water wells completed in fractured bedrock aquifers (Kennedy and Utting, LiDAR, Surficial Geology Mapping, and Water Wells: Uncovering Potential Surficial Aquifers in Halifax, NS 2011). These aquifers are located in the metamorphic and plutonic groundwater regions of the province and have limited groundwater supply capacity (Kennedy and Drage, Hydrogeologic Characterization of Nova Scotia's Groundwater Regions 2009). Approximately 20% of the groundwater quantity issues reported in the province's water well database (e.g. dry wells or well deepening/stimulation work; (Nova Scotia Environment 2011) occur along the unserviced corridor between Fall River and Hammonds Plains, an area that has experienced significant residential growth in recent years. Environmental and public health risks are created by residential development with insufficient quantity and/or unsatisfactory quality of water, along with public dissatisfaction when water supply expectations are not met. This creates pressure for unplanned extension of central water or sewer services to these areas at a significant cost to rate payers.

Wells are found throughout unserviced areas of the HRM, many of which have been in operation for decades (Map 28). However, water well drillers in Nova Scotia have only used GPS equipment to reference well locations since 2004, and this has impacted the development of a comprehensive management strategy for these areas. Water quality concerns remain prevalent throughout much of the unserviced area, as groundwater contamination (through arsenic leaching from the bedrock, as well as agricultural run-off) is coupled with septic leakage and localized industrial and brownfield site runoff concerns. Amendments were made in May 2010 to the Halifax Regional Municipality (HRM) Charter to allow HRM to require water supply evaluations for proposed larger subdivisions outside the water service area. This provides the HRM with greater authority to ensure that proposed subdivisions with private wells in HRM will have sustainable water supplies.

3.1.3.3 Wetlands

KEY ISSUES

- Expanding urban development places pressure on wetland habitats.
- Removal of wetlands from the landscape inhibits in turn removes the many valuable functions that they provide.

KEY OPPORTUNITIES

- Expansion of inventory of designated protected areas to include important wetland complexes.
- Provide mechanisms and incentives to landholders wishing to protect or enhance wetlands on their property.
- Encourage the retention of wetland habitat within the expanding urban core, particularly those contiguous with riparian corridors.
- Improve inventory of wetlands within HRM through increased analysis of existing data.

BOG

A bog is a type of peatland characterized by its distinct hydrology, which is sourced primarily from precipitation such as snow, rain, and fog. These wetlands are virtually unaffected by surface water and groundwater, and consequently, waters associate with bogs are low in dissolved minerals and quite acidic (pH 4.0-4.8 typical) (Warner 1997); (Rydin and Jeglum 2006). Acidity in bogs is further enhanced by the release of organic acids during the decomposition of *Sphagnum* moss, which is the dominant substrate of these peatlands (Warner 1997). The various species of *Sphagnum* mosses that compose these wetlands have a high capacity to store water in both living and dead plant tissues; as a result of this, anaerobic conditions form, inhibiting the decomposition of the *Sphagnum*, resulting in an ever increasing peat layer. This process of bog formation, known as ombrotrophication, increasingly isolates the bog flora from groundwater influence (Rydin & Jeglum, 2006). Peat formations are generally quite deep, on average 3-5 m in most of Canada, and occasionally up to 10 m in exceptional cases (Warner 1997).

Within the Halifax region, bogs are mostly treeless, although scattered black spruce, tamarack, and occasional white pine may be found. These tree species, where growing, are often stunted in their growth form. The presence of trees within bogs is often indicative of depth to water table, with patterns varying from completely or partially wooded at the wetland edges, grading to completely treeless at the centre (Rydin and Jeglum 2006). Bogs frequently contain a profuse growth of ericaceous dwarf shrubs including sheep laurel and bog laurel (*Kalmia polifolia*), leatherleaf (*Chaemadaphne calyculata*), Labrador tea (*Ledum groenlandicum*), and huckleberries (*Gaylussacia dumosa* and *G. baccata*).

Herbaceous vegetation is typically dominated by *Sphagnum* mosses. Lesser amounts of graminoid species are also characteristic of bogs, with various species of sedges (*Carex spp.*), cottongrasses (*Eriophorum spp*.), beakrushes (*Rhyncospora spp.*), and deergrass (*Scirpus cespitosus*) forming 'lawns' in the wetter depressions and flats. Herbaceous species such as bladderworts (*Utricularia spp.*) and pitcher plant (*Sarracenia purpurea*) are commonly encountered. Lichens such as reindeer lichen are often interspersed with *Sphagnum* and ericaceous shrubs in the dryer bogs and on bog hummocks.

MARSH

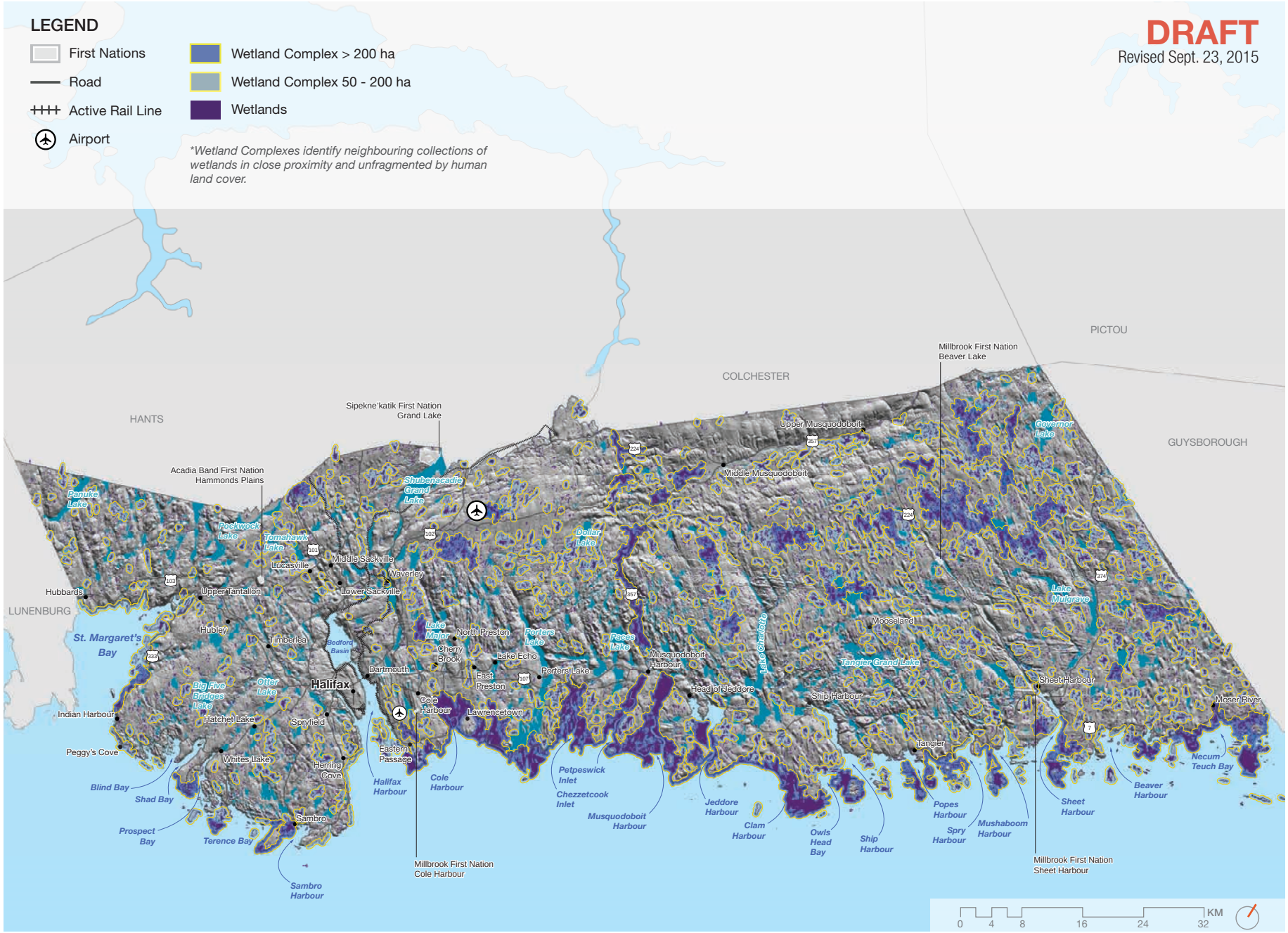
Marshes are mineral based (or occasionally peat based) wetlands which are periodically inundated by standing or flowing water. These are shallow-water (<2 m deep typical) wetlands whose seasonally fluctuating water levels are nutrient rich, and occasionally dry up or expose sediments. Within the region, the dominant vegetation comprises numerous herbaceous emergent species such as cat-tails (*Typha spp.*), rushes (*Juncus spp.*), reed grasses (*Calamagrostis spp.*) and sedges; in shallow open water areas, there is occasional emergent and floating leaved species.

The most common marsh types within the Halifax region are basin, riparian, and lacustrine marshes. Basin marshes are located in well-defined topographic basin in inland areas, and may receive water inflow primarily from groundwater discharge, overland flow or river inflow. Riparian marshes occupy the riparian zones of rivers and streams, typically in swales bordering, but not directly attached to the water body. These receive their hydrologic regime from overland flow of water from adjacent uplands, and from periodic overbank flooding from the stream or river (Warner 1997). Both basin and riparian marshes often tend towards a dominance of cat-tails (*Typha spp.*), rushes (*Juncus spp.*), reed grasses (*Calamagrostis spp.*) and sedges (*Carex spp.*). Lacustrine marshes are located in shallow, sheltered bays at the peripheries of lakes and ponds, and receive their hydrological inputs therefrom. Lacustrine marshes frequently contain emergent vegetation such as cat-tails, bulrushes (*Schoenoplectus spp.*), pickerel weed (*Pontederia cordata*), and floating leaved vegetation including waterlilies (*Nuphar variegata*, *Nymphaea odorata*), pondweed (*Potamogeton spp.*), among other species.

FEN

Fens are peatlands that have a fluctuating water table that is either at or slightly below the wetland surface (Rydin and Jeglum 2006) and are rich in dissolved minerals derived from the influence of surrounding mineral soils (Warner 1997). In contrast to bogs whose hydrology is sourced from direct precipitation, fen hydrology is sourced from ground or surface water. Fen vegetation is typically more diverse than in bogs, and is closely related to the depth of the water table and to water chemistry. Sedges and mosses dominate wetter fens, where the water table is above the soil surface. Trees, although shrubby, may be present in drier fens and may include birch (*Betula spp.*), red maple, tamarack, and various species of willow (*Salix spp.*). Black spruce may be present in the driest fen sites, where moss hummocks provide microhabitats above the water table. Fens are among the most diverse wetland ecosytems in terms of their vegetation and can support rare and endangered species of vascular plant species (Bedford and Godwin 2003) particularly in areas of calcareous geology (Johnson and Leopold 1994). Groundwater and surface water movement are common characteristics that distinguish fens from bogs. Surface flow may be directed through channels, pools, and other open water bodies.

Map 29. Wetland Complexes



SALTMARSH

Saltmarshes are vegetated coastal wetlands flooded regularly by the tides, or influenced by salt spray or seepage, resulting in a brackish environment dominated by halophytic species of plants. Saltmarsh vegetation is dominated by various species of cordgrass (*Spartina spp.*), with salt-water cordgrass (*S. alterniflora*) typically occupying low marshes, which are flooded regularly. Salt meadow cordgrass (*S. patens*) dominates in high marshes areas that are less frequently inundated by the tides. Saltmarshes are extremely productive, and provide many critical functions and services, including flood protection, sediment stabilization and habitat for fish and wildlife. Within the HRM, and province-wide, large areas of salt-marsh have been lost to coastal development, agriculture, and road construction.

SWAMP

Swamps are a class of minerotrophic (ground or surface water influenced) wetlands which are predominantly vegetated with trees or shrubs and have a water table at or below the wetland surface. These can be either mineral or peat based wetlands; in the case of the latter, the organic material is generally highly decomposed and often high in wood content. The range of pH in swamps is somewhat variable, but tends toward the acidic side of neutral (4.5-7.0 typical). Swamps can occupy a wide array of landscape positions, including riparian areas, basins, drainage-ways, and broad slopes. Vegetation cover can be indicative of the nutrient regime of the wetland, with richer sites often tending towards a predominance of deciduous trees or shrubs; commonly included are red maple, wild raisin, false holly (*Nemopanthus mucronata*), Canada holly (*Ilex verticillata*), and speckled alder (*Alnus incana*). Coniferous species (chiefly black spruce and tamarack) are tolerant of a broader range of nutrient availabilities (Warner 1997). Treed swamps are one of the most common wetland types in the region. However, they are frequently unmapped in the NSDNR Provincial Wetland Inventory, owing to the difficulty in discerning these from aerial photos.

3.1.3.4 Lakes, Rivers and Streams

KEY ISSUES

- An extensive network of primary streams, coupled with shallow groundwater aquifers and widely distributed lakes and wetlands, make water quality an essential factor for both the ecological and community well-being of this region.
- Acidification of rivers and lakes has severely impacted historical salmon spawning areas, leading to a reduction of salmon populations throughout much of the region.
- Stormwater discharged into water bodies and streams.
- Canalization of rivers impedes the movement of aquatic species.
- Flooding of the Shubenacadie Canal is an ongoing concern.
- Shallow lakes are easily impacted by runoff.
- Uncontrolled stream crossings in some areas have resulted in damage to the stream bed and surrounding riparian vegetation.
- Road salt runoff into nearby streams and water bodies is a concern.
- Runoff and sedimentation from nearby cutting areas and major infrastructure (e.g. Ingramport Highway interchange).
- Many stormwater systems are too small to absorb growth.
- Some homes and business still have sewage and grey water flowing by pipe directly into the cove (e.g. Hubbards).
- Permanent wetlands are used as storm ponds in some areas (e.g. Belchers Marsh Park).
- Recent algal outbreaks along the Dan River highlight water quality concerns in the HRM. Although this outbreak does not appear to have direct health impacts, its strong odor poses aesthetic and quality-of-life concerns for local residents. The source of the water contamination is within the borders of the United States, highlighting the jurisdictional issues associated with water quality management.
- Algal blooms pose challenges in the management of water reservoirs. Ongoing blue-green algae blooms in other parts of Nova Scotia highlight the

impacts of agriculture and livestock farming on the water quality of surrounding water bodies.
- Unicellular and filamentous blue-greens are commonly present in freshwater lakes, frequently forming dense planktonic populations or water blooms in eutrophic (nutrient rich) waters. The main factors influencing the development of planktonic populations are light, temperature, pH, nutrient concentrations, and the presence of organic solutes.

KEY OPPORTUNITIES

- Many rivers and streams in the eastern portion of the region show little sign of human impact, providing the opportunity to maintain these natural systems.
- Daylighting historic streams that are currently piped underground, removing canals and restoring heavily degraded watercourses will have far reaching impacts to water quality, connectivity of aquatic species, and the maintenance of ongoing natural processes in the region.
- Land use management in key sub-basins is an important factor in maintaining water quality.

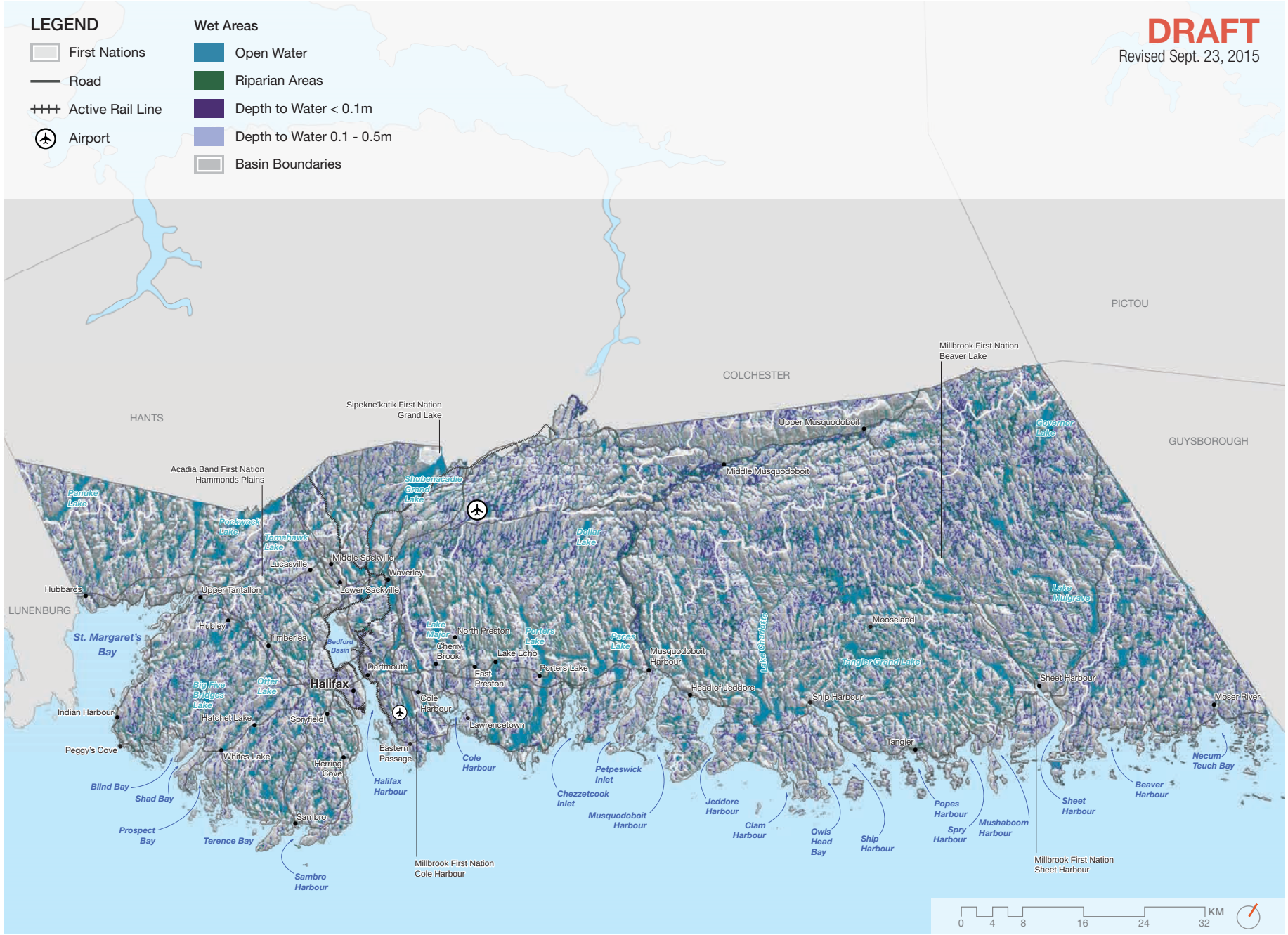
GENERAL DISCUSSION

The HRM includes a substantial number of lakes, the largest of which are Tangier Grand Lake, Scraggy Lake, Lake Charlotte, Porters Lake, and Lake Major, covering a substantial portion of the landscape.

Rivers here host remnant runs of federally endangered Atlantic Salmon (*Salmo salar*). The Musquodoboit River is the most diverse river valley in this region of the province. Its banks contain rich floodplains and adjacent wetlands, a comparatively healthy population of Atlantic Salmon as well as several populations of federally threatened Wood Turtles (*Glyptemis insculpta*) and provincially sensitive sea-run Brook Trout (*Salvenius fontinalis*). Any persistent river with a neutral pH is potential habitat for Atlantic salmon. The Musquodoboit River is one of the few rivers in the HRM which is not seriously affected by acidity. Hence, this river yields a large proportion of the salmon angled in the HRM (Department of Fisheries and Oceans 1998). Musquodoboit River salmon are among the earliest to spawn in Nova Scotia. Spawning typically begins in mid to late October. The East River, Sheet Harbour, is used as an index river for partially acidified rivers. Much of the habitat (95%) in this river is largely inaccessible to anadromous fish because it lies above an impassable hydroelectric dam built in the 1920s (O'Neill, et al. 1998). The Liscomb River is considered acid-stressed. This river drains an area of 400 km^2, and several of its tributaries also cannot support salmon due to acidity levels (O'Neill, et al. 1998). The West River, Sheet Harbour, is considered acid-stressed and returns to this river are critically low (Department of Fisheries and Oceans 1998). One tributary of the river, the Little West, has a pH level of 5.2 so is less acid stressed than much of the watershed. One tool to mitigate the acidity that has been employed in the West River is the spreading of limestone gravel. In an attempt to protect the remaining salmon, angling has been closed on this river since 1993 (O'Neill, et al. 1998).

Many rivers have been historically modified through damming, many of which have deteriorated substantially since their construction. Dam removal benefits salmonids by: (1) removing obstructions to upstream and downstream migration; (2) restoring natural riverine habitat; and (3) eliminating siltation of spawning and feeding habitat above the dam.

Map 30. Streams, Basins, and Riparian Areas



Obstruction Removal: The condition of the structure at each target location including the degree of deterioration dictated what was required to remove the existing obstruction. In some cases the deteriorated structure may be completely removed, while in other cases components of the structure including retaining walls would be left intact to ensure structural integrity, and prevent any potential collapsing of the stream bank and related erosion issues.

Important/sensitive rivers and water bodies (areas of concern expressed by public outreach):

- Sackville River
- Musquodoboit Harbour
- Critical wetlands in lower West Jeddore
- Salmon spawning habitat (Sandy Lake)
- Litle lake
- Feely Lake
- Nine Mile River
- Fall River
- Dan River
- Blue Mountain / Birch Cove lakes

3.1.3.5 Coastal Shoreline and Wetlands

KEY ISSUES

- Tidal wetlands (aka, saltmarshes) are essential centres of biodiversity in the region, occurring at the interface between saline tidal waters and terrestrial landforms. Tidal flats and inlets provide a richly diverse set of habitats, leading to a high number of rare and migratory birds.
- Climate uncertainty, and the likelihood of sea-level rise, makes the protection and maintenance of coastal terrain (including tidal wetlands), and the habitats it affords, a chief concern.
- Unmanaged recreation activities on the shoreline are compromising ecological function in some areas (e.g. Martinique Beach / Bayers Islands Archipelago, Eastern Shore Islands / Bay of Islands, Silver Sands areas are all highly valued and at risk from development and overuse).
- Shorelines, important for both breeding native local species and migratory birds, are threatened by development and recreational use (e.g. Piping Plover and other important habitats that have been degraded).
- Industrial infrastructure along the coastline makes runoff and contamination a concern.
- Saltwater intrusion.
- Stormwater run-off into waterways.
- Sea level rise predicted to produce extensive changes to coastal habitats.

KEY OPPORTUNITIES

- Highly visible scenic coastlines are a high profile opportunity for public outreach and education about coastal zone management.
- Coastal zones provide unique habitats to a wide variety of local and migratory species, while at the same time, increasing the appeal of the area to tourists, researchers, and local wildlife enthusiasts.
- Coastal protection has benefits to neighbouring land-owners, as well as to the environment.

GENERAL DISCUSSION

The numerous bays and inlets in the region vary in size and characteristics. Large bays such as St. Margaret's Bay have marine environments similar to the conditions of the offshore (Davis and Browne 1996). Oceanic organisms such as jellyfish and pelagic fish frequently enter the bays and seaweed populations can be widespread. Although they may receive influxes of fresh water from coastal streams, the bays are not estuarine.

Most harbours and inlets were formed as a result of submergence of river valleys (Davis and Browne 1996). Coastal water bodies are generally warmer, more sheltered and have less wave exposure than exposed sections of the ocean coastline. As a result, animal, and plant communities in these areas differ from those found on the open coast.

The beach and dune systems of the region arose from glacial erosion, but are maintained by the erosion of headlands and the transport of sediment through longshore drift and other littoral processes. Many of the sandy beaches along the Eastern Shore form barriers at the mouth of inlets and estuaries, producing shallow water lagoon-type environments that are vegetated, and therefore favorable to diverse birdlife (Smith 2012). Martinique Beach, a five kilometer stretch of fine sand beach and dunes, is at the mouth of Musquodoboit Harbour estuary and protects an extensive area of salt marsh and mudflats vegetated by Eelgrass (*Zostera marina*) which have been designated as a Ramsar Wetland of International Significance. Thousands of Canada Geese, American Black Duck, and a variety of other waterfowl overwinter in this and the other estuaries found westward towards Cole Harbour. Rainbow Haven, Conrads, Stoney, Lawrencetown, Martinique, and Clam Harbour beaches have been used as nesting and breeding sites by the federally endangered Piping Plover with Martinique and Conrads being the most frequently used. Migrating shorebirds use these beach/dune systems for feeding and roosting as do raptors which hunt for small mammals within the dunes. Some of the most characteristic plant species of these beaches include American Beach Grass (*Ammophila breviligulata*), American Dune Grass (*Elymus mollis*), Seabeach Sandwort (*Honckenya peploides*), and Sea-rocket (*Cakile edentula*). Conrads Beach has a small population of the rare (S2) Common Moonwort (*Botrychium lunaria*).

ROCKY, BOULDER AND COBBLE SHORES

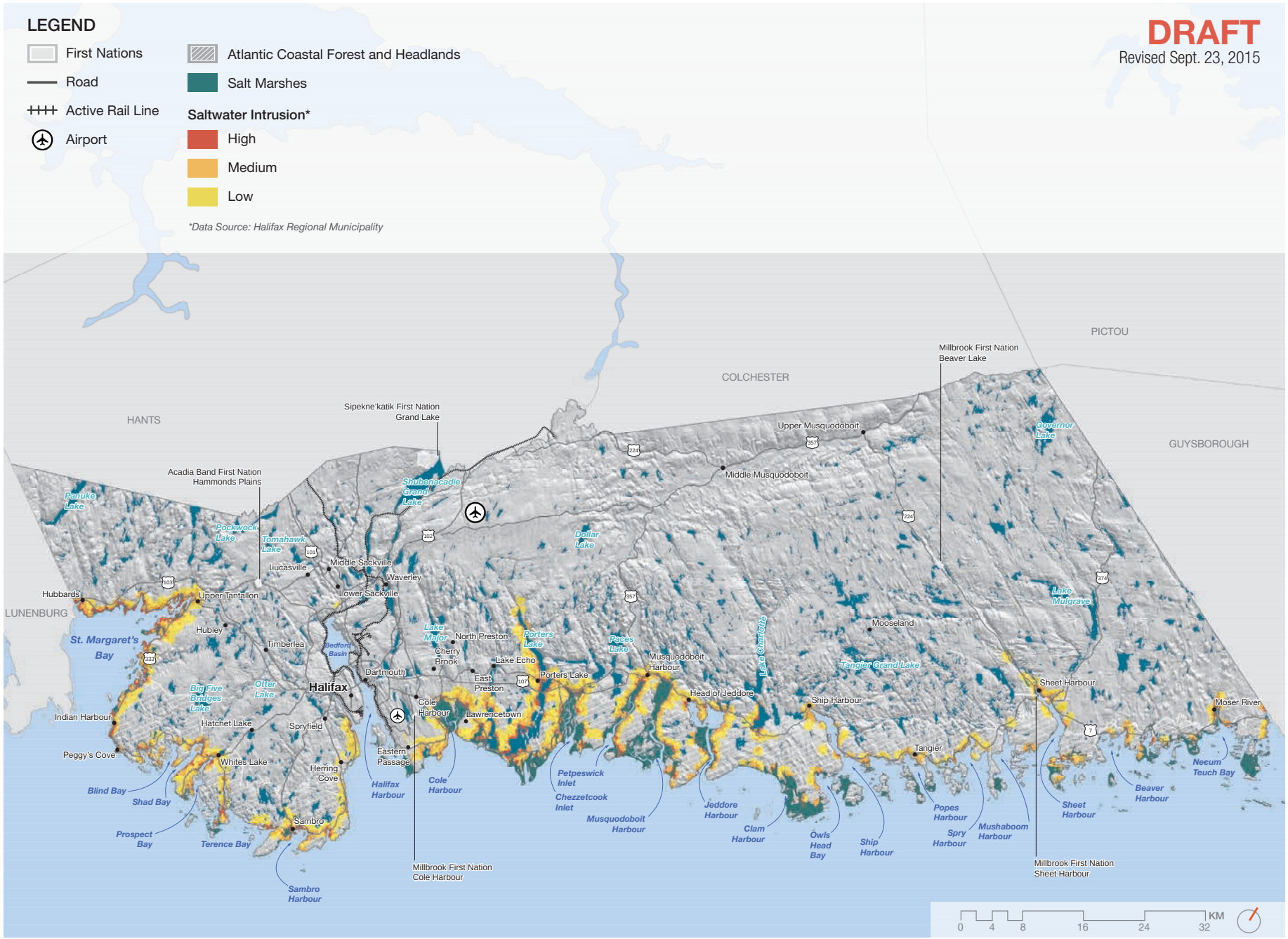
This type of shoreline ecosystem is ubiquitous throughout the coastal zone of the Halifax region, and provides habitat for a variety of flora and fauna. Marine algae such as rockweed (*Ascophyllum nodosum*), bladderwrack (*Fucus vesiculosus*), and kelp (*Laminaria digitata*) are well represented, and contribute to the provision of productivity and habitat complexity for other marine species, including fish, snails, various bivalves, crabs, and other invertebrates. Owing to the productivity and abundance of invertebrates in the intertidal zone, marine bird breeding colonies are commonly encountered in rocky shore ecosystems (McCullough, et al. 2005). The intertidal zone is also frequented by terrestrial species, which access this type of habitat at low tide to feed (Davis and Browne 1996). Examples of this type of high productivity system are found in St. Margaret's Bay.

In the high-energy wave environment of the Atlantic shore, rocky, boulder, and cobble shores provide critical barriers that protect shoreward ecosystems and infrastructure. These shores also notable for their aesthetic appeal, both by tourists and local residents. These rocky shore ecosystems face increasing pressures from human disturbance through tourism, and coastal development; both of which can disrupt their ecological function of these rugged coastlines, if not mitigated appropriately.

SANDY SHORES AND SAND DUNES

Sand-dune systems may occur in coastal areas where there is an adequate sediment supply to form these areas. In such areas, sand is deposited on beaches by both wave and wind action, and may become stabilized through the colonization of American beach grass (*Ammophila breviligulata*). Through later stages of succession, dunes may in turn colonize woody vegetation, of which wild rose, bayberry, and white spruce are most common. Plant diversity (both terrestrial flora and marine algae) along these sandy coasts is generally limited, owing to their high exposure and mobility of the substrate (Davis and Browne 1996).

Map 31. Coastal Areas



COASTAL WETLANDS

With the exception of those in the vicinity of Lawrencetown, HRM, saltmarshes are relatively under-represented within the region as a whole. Typically, saltmarshes are divided into a high marsh and a low marsh, each with a distinct plant community, as described in the Wetlands section (Section 3.1.3.3). Coastal variants of freshwater wetlands (i.e., bogs, fens, marshes, swamps; also referenced in the 'Wetlands' section) are common throughout the region, and may form complexes with saltmarshes. Additionally, coastal saline ponds (commonly known as lagoons or barachois) are identified in NSDNR's saltwater wetland inventory, but can also be considered part of the open water ecosystem. These are often associated with barrier beaches.

3.2 WORKING LANDSCAPES

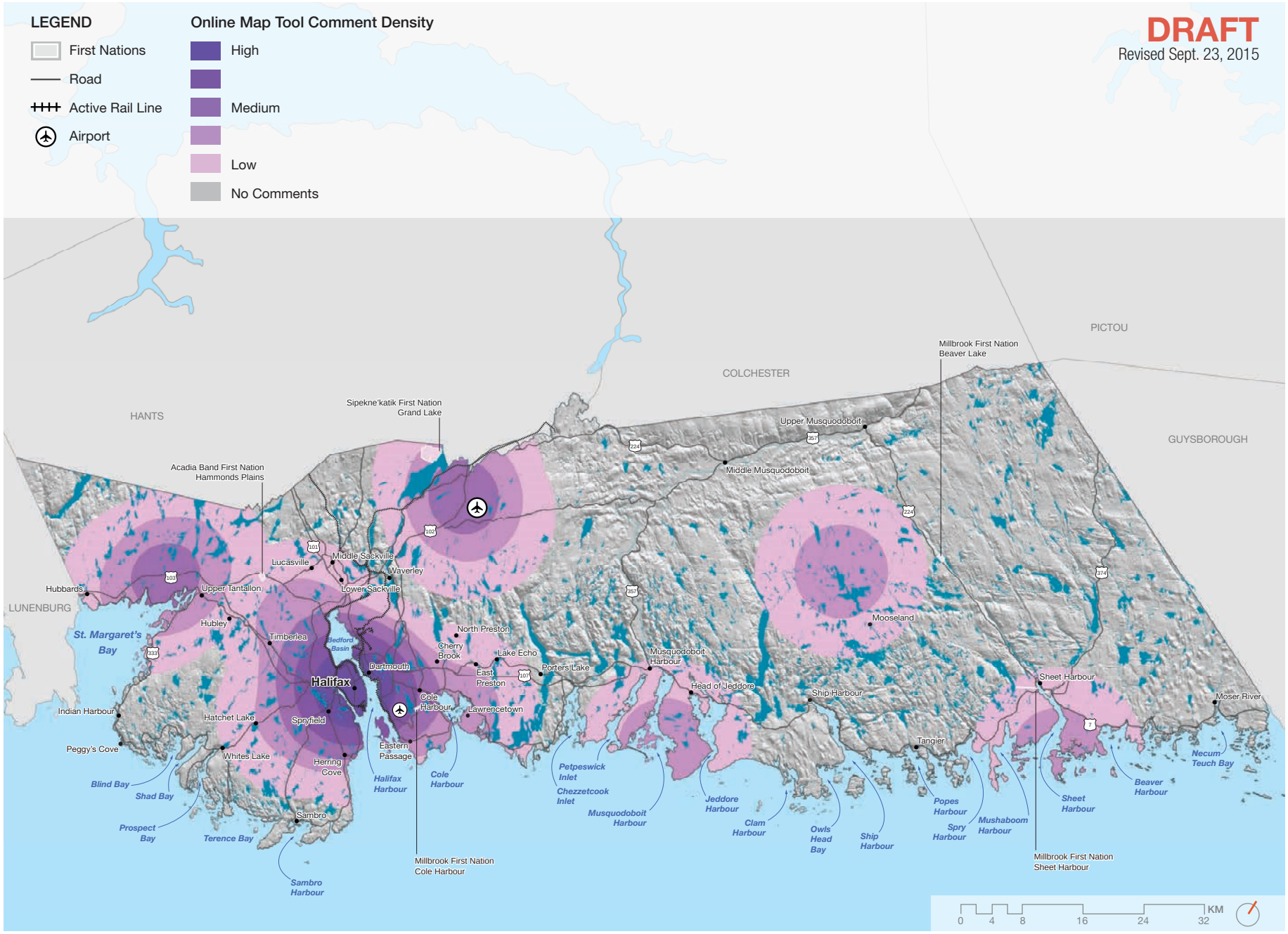
Values: Working landscapes provide important economic development opportunities, while ensuring the viability of ecosystems in the long-term. The preservation of traditional land-uses, food security and the viability of rural communities all strongly depend on a thriving working landscape.

3.2.1 Mining and Aggregates

KEY ISSUES

- Aggregate extraction is an important part of the provincial economy in terms of revenue, local employment as well as supplying commercially important raw materials.
- Mining is an important part of the provincial economy but there are no active mineral mines in the HRM.
- Ecological sustainability and community acceptance of mining disturbance and reclamation are prominent issues today.
- The economic viability of mining depends on many changing factors including accessibility, infrastructure, technology development, price, and access to markets.
- The ongoing health of the industry is dependent on further opportunities for mineral exploration and extraction.
- The future of local resource extraction is at odds with encroaching development and competing land uses.
- The maintenance of a large, reliable, locally-sourced aggregate supply is strategically vital to urban development and the maintenance of transportation infrastructure.

Map 32. Density of Online Public Comments – Working Landscapes



KEY OPPORTUNITIES

- Identify areas of high resource potential and ensure that opportunity costs of residential development are highlighted. Work with mining and quarrying companies to develop mine closure plans that are consistent with other objectives of the HGNP and Regional Plan.
- Ensure progressive reclamation of mines and quarries, wherever feasible.
- Improve the environmental impact of exploration and extraction through technology development.
- Low impact planning and operations to mitigate negative impacts on surrounding communities and lands.
- Ensure funding is maintained and made available for reclamation activities to reclaim active operations and brownfield sites to a natural state.

GENERAL DISCUSSION

The HRM contains a wide variety of valued elements, providing a diverse set of economic factors which contribute to the well-being of the region, and its residents. As the region contains a mosaic of public and private lands, the management of the working landscapes of the HRM requires effective communication and collaboration between a wide range of stakeholders, in order to meet the needs and objectives of the various economic workforces in the region. Online public consultation has provided a useful overview of the areas, which have been publicly identified as important, valued, or at risk (Map 32).

3.2.1.1 Mining

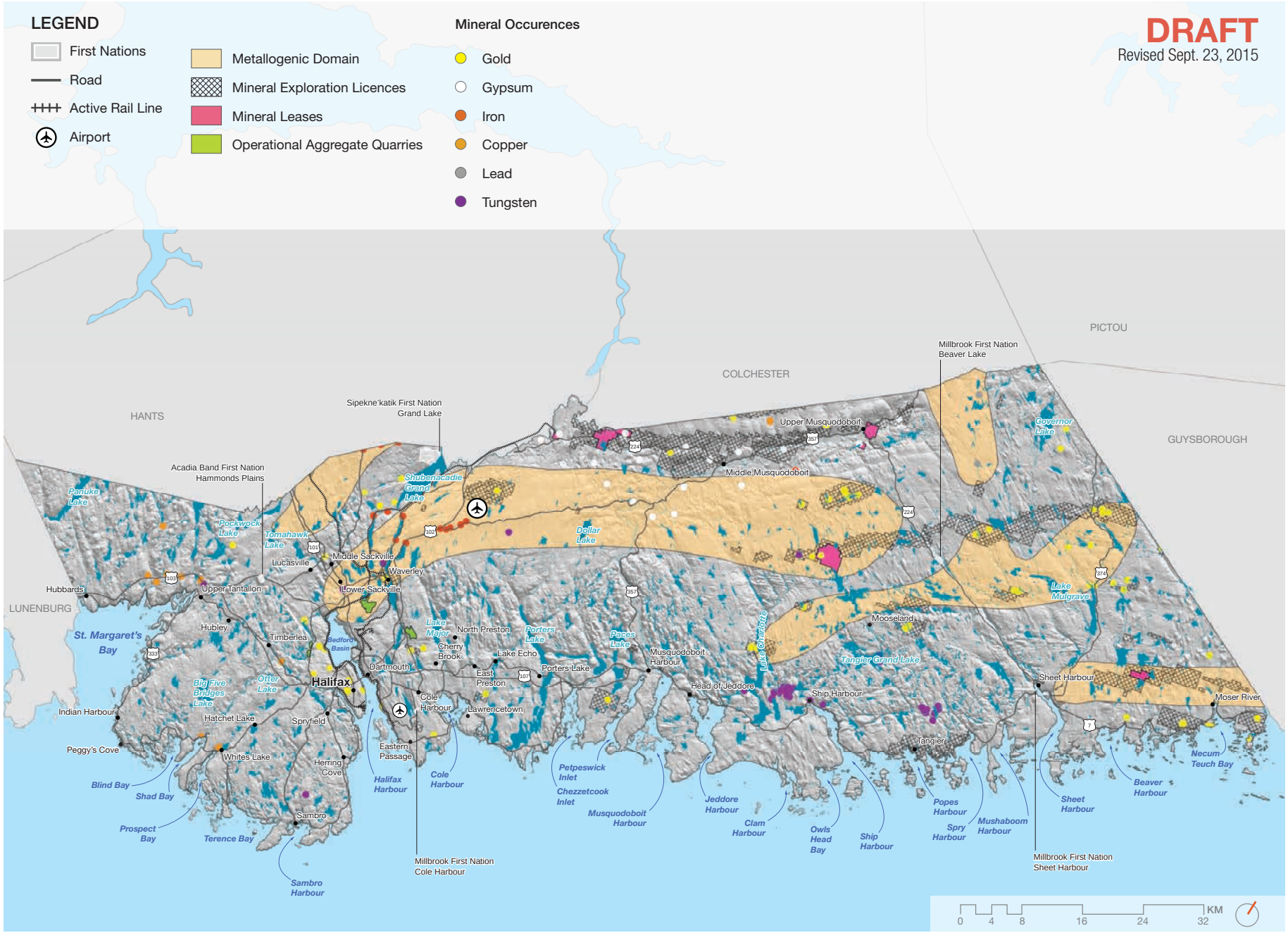
Nova Scotia's mining and quarrying industry is a significant creator of jobs and prosperity for Nova Scotians. It provides 5,500 jobs throughout the province, mostly in rural areas (Map 33), and contributes $420 million to the province's economy each year (Mining Association of Nova Scotia 2015). There are many active licenses for the exploration of mineral resources, but the transition to mine development is difficult and expensive. Few exploration licenses make this transition successfully. There is a growing gap between resource access and community expectations.

Mining and processing of metal minerals (i.e., gold, lead, and zinc) and industrial minerals (i.e., clay, shale, limestone, and gypsum) has historically been the most important parts of the industry, although new opportunities may be emerging with rarer minerals such as tungsten. There are currently no active metal mines, but there are four industrial mineral mines within or immediately adjacent to the borders of the HRM: clay in Lantz and Shubenacadie, gypsum in Milford, and limestone in Upper Musquodoboit (Gardner Pinfold Consulting 2013).

Nova Scotia has experienced three relatively short-lived gold rushes over the past 150 years. Gold deposits are mainly found in the eastern part of HRM dispersed in quartz veins and some sedimentary deposits. Many are small and are difficult and expensive to access making profitability an issue. A gold extraction project is currently proposed for Moose River. It received environmental approval in 2008 and in 2011 and a lease has been issued for the development of a mine. The project is expected to employ 400 people during construction and 170 during production (Gardner Pinfold Consulting 2013). Currently initiation of this project depends on improvements in the global price of gold.

Gold deposits are commonly associated with naturally occurring arsenic and extraction involves the use of hazardous chemicals. The waste and by-products of mining and processing are of considerable environmental concern and effective waste management is challenging. There are many old abandoned sites that potentially pose an ongoing threat to local waterways and wildlife. Post-production management of the site is now an important part of licensing.

Map 33. Mineral Potential



The Province is planning to increase the coverage of protected areas to 13% of land in the province. Designation will remove lands from potential resource extraction. In the HRM the existing and proposed protected areas cover 17% of the lands. Compensation may be extended to existing lease-holders but overall this increases the value of remaining land in the province where mineral potential exists.

The Province may now be in a better position to profit from the extraction through business tax, income tax, royalties and employee spending (Jamasmie 2014). It continues to actively promote mineral extraction and works to ensure the health and viability of the industry.

3.2.1.2 Aggregates

Accessible aggregate sources are an essential aspect to new developments, and an ongoing necessity for the maintenance of existing infrastructure. Residential and commercial construction as well as road construction and repair are an important part of the local economy. The maintenance of a large, reliable, locally-sourced aggregate supply is strategically vital.

The Halifax-Dartmouth metropolitan area (Metro) is the largest aggregate market in Atlantic Canada, consuming more than 3 million tonnes of crushed stone from local bedrock quarries annually (Prime and Bonner 2007).The overwhelming majority of the stone used in the region is supplied by three quarries located in and on the outskirts of the Halifax-Dartmouth area (Gardner Pinfold Consulting 2013). There are also small gravel pits scattered around the municipality that are mainly used for local projects.

In spite of the favourable geology and a thriving stone industry, a recent report on the aggregate potential of the Halifax-Dartmouth area concluded that the future of the local resource is being threatened by encroaching development and competing land uses (Prime and Bonner 2007). Access to the area's aggregate resources will become progressively more difficult in the future. Decades of population growth and urban development have rendered much of the resource land inaccessible for extractive use (Prime and Bonner 2007). Proposals also generate considerable opposition by local land owners and residents.

Based on the experience of other large urban centres around the world which have faced similar experiences, the options for the HRM may include the following: importing stone from distant quarries by truck, importing stone using bulk transport by train, barge or ship, dredging offshore marine gravels on the Scotian Shelf, or accessing aggregate via underground mining in proximity to the HRM metro area (Prime and Bonner 2007). All of these will increase the cost of construction and place the HRM in competition with other markets for supply. For these reasons, maintaining access to local aggregate sources is an important aspect of regional planning in the HRM.

3.2.2 Agriculture

KEY ISSUES

- Agriculturally productive soils are limited in the HRM (15.4% of the Region).
- Halifax has 2% of the province's CLI 2 soils, 6% of CLI 3 and 4% of CLI 4.
- Premium agricultural soils are only moderately utilized (31% in agriculture).
- Urban use and fragmentation of agricultural lands is reducing the viability of some farming areas (10% of the HRM's best agricultural soils are under urban development, particularly in the Dartmouth area).
- Growing interest in local food production and urban agriculture.

KEY OPPORTUNITIES

- Protection of prime farmland through zoning, policies, and incentives for urban intensification and restriction of suburban development.
- Disincentives for development on prime farmland.
- Explore partnerships, policies, and programs to strengthen the local food system in light of a limited supply of high quality agricultural land, increased uncertainty due to climate change impacts, rising food transportation costs, and a growing public demand for the municipality to support local food.
- Promote urban agriculture to improve stormwater retention, access to local food, connections to food production, and social cohesion.

GENERAL DISCUSSION

Halifax has approximately 7,500 hectares in agricultural production (Table 6). This amounts to just over 3% of the area of the province. Farming in Halifax uses about 1.5% of the HRM land area (NSDA, 2015). As of the 2011 census, there were 164 farms in the HRM with a total farm area of 15,119 ha, representing 4.2% of the number of farms in Nova Scotia. Gross farm receipts in Halifax amounted to $25,137,688 in 2011 (Statistics Canada 2011). Wild blueberries account for more than half of the value of all fruit production in Nova Scotia. The value to the industry in 2014 was $34.1 million. Halifax also has 3.3% of the provincial 538 hectares of wild blueberry production or approximately 3% of the Nova Scotia total. Dairy and mixed farming are important sources of employment despite the fact that the number of farms has declined in the last 50 years (Halifax Food Policy Alliance Food Assessment Working Group 2014).

Agriculturally productive soils in the region are derived from glacial deposits such as drumlins, alluvial plains, and outwash fans which produced loamy soils suitable for farming. These areas are very limited in extent. Lands most suitable for agricultural production (CLI classes 2, 3 and 4) are used for agriculture in Halifax at a lower rate than the provincial average. About 8% of suitable agricultural land is used for agricultural production in Halifax, compared with 13% provincially. Agriculture in the HRM generally occurs on good agricultural soils. Over half of agricultural land is on class 3 soils, while 13% is on class 2 soils and 13% on class 4. Approximately 15% of Halifax agriculture is on class 4 soils or lower. The HRM has about 10% of its good agricultural soils under urban development, ranking Halifax 3rd in utilization of arable land for farming in the province. This is significantly higher than the provincial average of 5.4%. However, only 1% of urban development occurs on class 2 soils, and 6% on CLI4 land. The majority of the urban areas that comprise up to 18% of CLI3 land are in the Dartmouth, Bedford/Sackville, and Musquodoboit Valley areas. However, approximately 91 hectares (1.2%) of the Agricultural Land Identification Project (ALIP) land in Halifax have been lost to urban development since 1998.

The main agricultural area of the HRM is the Musquodoboit Valley. It has the greatest concentration of agriculturally productive soils and is the only remaining prime farmland in Halifax that is largely unaffected by non-agricultural uses (Halifax Food Policy Alliance Food Assessment Working Group 2014). Map 34 illustrates the locations of the most agriculturally productive soils in the HRM according to the Canada Land Inventory (CLI) Soil Capability for Agriculture class system. The Musquodoboit Valley has no significant limitations to moderate limitations for agriculture (CLI class 2), indicating that agricultural potential in this area is high. There is no class 1 soil in Nova Scotia according to the CLI.

Table 6 Agricultural Land Statistics – HRM

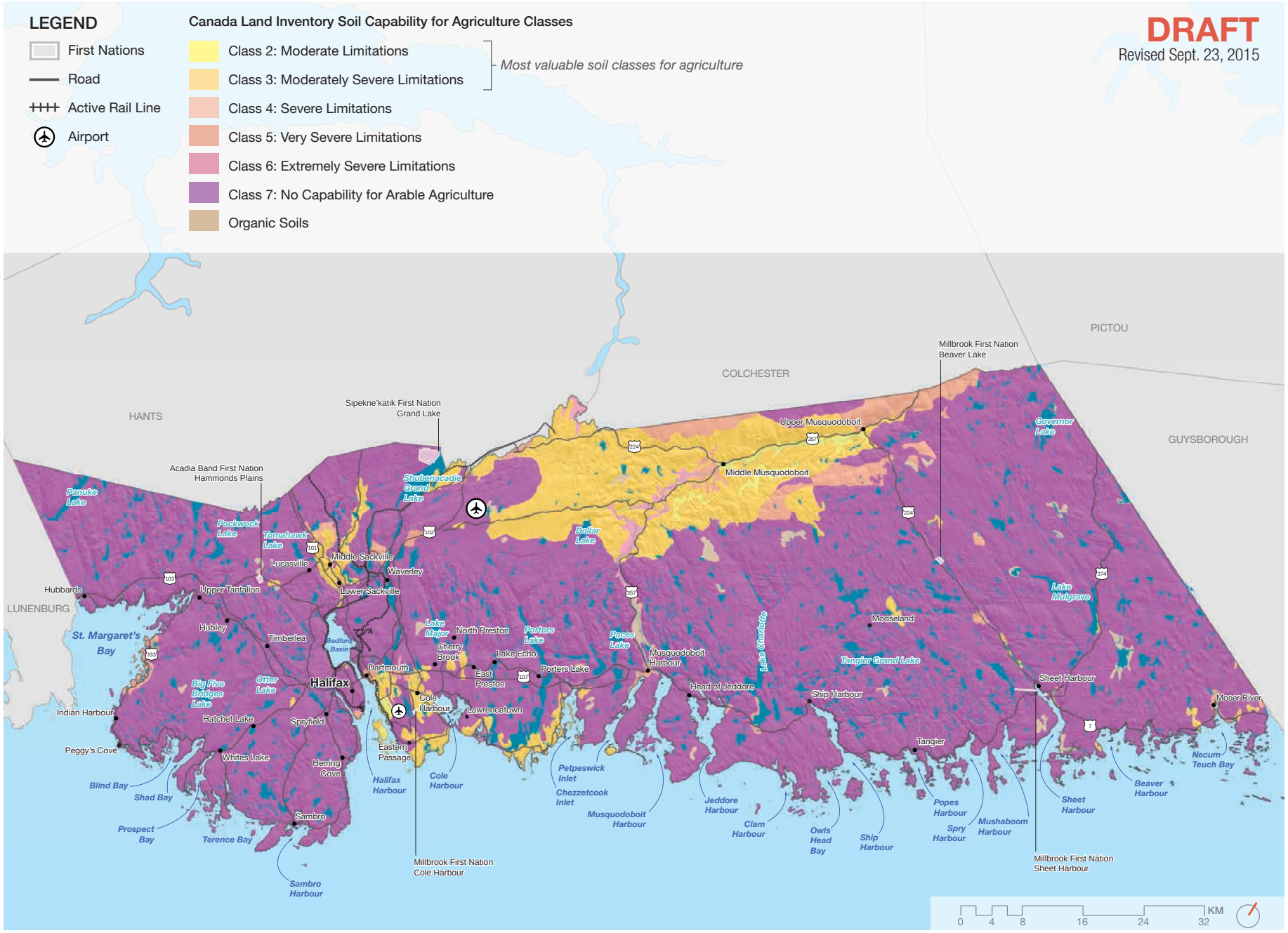
	Hectares	% of provincial total	% of the HRM land area
CLI 2,3,4 TOTAL	83,941	5.3	15.4
CLI 2	3,093	1.9	0.6
CLI 3	63,149	6.4	11.6
CLI 4	17,699	4.2	3.3
Agricultural land (ALIP)*	7,676	3.3	1.4
Agricultural land (DNR)**	7,488	3.3	1.4
Blueberry land (DNR)**	538	3.3	0.1

* As indicated by the NSDA Agricultural Land Identification Project.

** Based on forest coverage files from NS Natural Resources (blueberry land is low-bush/ wild)

Source: Nova Scotia Department of Agriculture, Natural Resources Canada, Nova Scotia Department of Natural Resources.

Map 34. Agricultural Potential



The rest of the municipality is largely unsuitable for agriculture (CLI class 6), with the exception of a few pockets of agricultural potential near Dartmouth and Cole Harbour. Much of the potentially suitable agricultural land was lost to suburban development in the 1970s and 1980s – particularly in the Sackville area. Outside of the Musquodoboit Valley, there are three urban farms in Halifax: Spryfield Urban Farm, the Cole Harbour Heritage Farm Museum, and Common Roots Urban Farm. Collectively, these urban farms encompass approximately only 9.5 acres (Halifax Food Policy Alliance Food Assessment Working Group 2014). These initiatives, together with the multitude of community gardens in many residential areas, illustrate a growing interest in local food production.

3.2.3 Forestry

KEY ISSUES

- The majority of forested lands are privately owned, making consistent sustainable management a challenge.
- Forests continue to exhibit a trend toward younger age class distributions.
- Softwood land capability in the HRM is relatively low.
- Brown spruce longhorn beetle has compromised forest health.
- Clear-cutting is a controversial harvesting method. Some HRM residents (including from the Sheet Harbour area) are concerned that clear-cutting threatens the visual resources and ecosystem health of the region.
- Conflicting public uses on forest lands present safety concerns, particularly on haul roads.
- Productive hardwood stands in the HRM are limited.

KEY OPPORTUNITIES

- The HGNP may provide opportunities to co-ordinate municipal and provincial efforts so that commercial forest and agroforest resources in the region are considered together with other important forest values and Network elements.
- Nova Scotia has undergone a significant transition towards ecosystem based management and Integrated Resource Management (IRM). There is significant potential to coordinate forest management efforts on Public lands, administered by the DNR, with woodlot management on private lands and green network efforts.
- The protection of productive forest stands for commercial purposes is important to the industry.
- Protect pockets of the areas of higher forest land capability from encroachment by urban development.
- Expansion of agro-forestry in the Musquodoboit Valley.
- Expansion of community managed forests on crown lands to provide livelihoods and other economic benefits.
- Ensure recreation, tourism, and traditional use/values objectives are considered in the management of both private and public forest resources. These considerations include visual resource management objectives.
- Implement policies and practices that manage for the continued presence of large patches of old growth Acadian Forest on the landscape.

GENERAL DISCUSSION

Nova Scotia is situated in the Acadian Forest Region (Halifax Regional Municipality 2013). The Acadian Forest Region, especially in Nova Scotia, has one of the longest histories of forest exploitation in North America (Halifax Regional Municipality 2013). According to the 2008 State of the Forest Report for Nova Scotia, approximately 77% of the province is covered by forested land (Nova Scotia Department of Natural Resources 2008). Approximately 428,773 ha, or 58% of the HRM is covered by forested land. However, the productivity of these lands for commercial forest operations is limited, with only 4714 ha in softwood productivity classes over (6.6 m3 / year). Productive hardwood stands are relatively limited in the HRM. The protection of productive forest stands for commercial purposes is important to both large and small operators. Forestry and agroforestry (the growing of trees on farms) is most common in the Musquodoboit Valley and Eastern Shore areas – there are 21 sawmills in these areas.

Forests across the province continue to trend towards age class distribution with younger classes. Between 1995 and 2005, forest age determinations showed a reduction in area of forests older than 60 years. Due to forest conversion to agriculture, urban development, natural disturbance and forest management, the forests around Halifax are dominated by younger age classes and early-successional species such as red maple, white and gray birch, poplars, pin cherry, and serviceberry (Halifax Regional Municipality 2013).

3.2.3.1 Forest Productivity

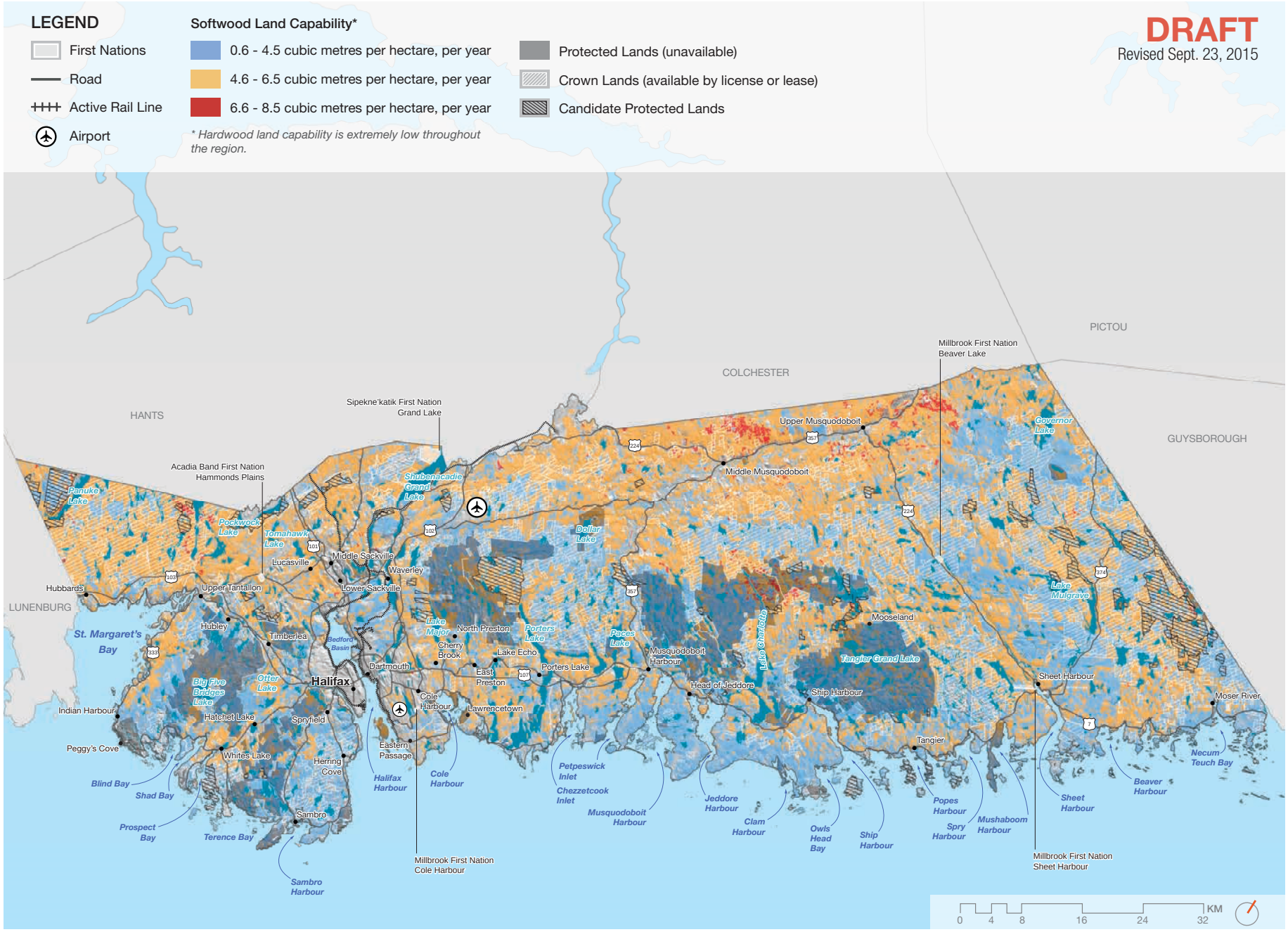
A significant portion of forest land in the HRM is protected by legislation as provincial parks and wilderness areas. Some Crown land also has restrictions on use where the priority activity is related to wildlife management, recreation, and biodiversity protection and includes areas such as park reserves, game sanctuaries, and wildlife management areas (Nova Scotia Department of Natural Resources 2008).

Map 35 illustrates the distribution of productive lands for softwood trees, as well as the locations of protected areas, candidate protected areas, and crown land. Softwood land capability in the HRM ranges from 0.6 cubic metres per hectare per year to 8.5 cubic metre per hectare per year. The areas exhibiting the highest softwood land capability classes are located in small pockets in the Musquodoboit Valley.

In recent years, several major issues have had significant impacts on the region's forests. In 1999, the brown spruce longhorn beetle, a beetle not known to be established elsewhere in North America, was discovered in red spruce trees in Point Pleasant Park. Subsequently in 2003, Hurricane Juan caused major blow downs throughout forests in the HRM; Point Pleasant Park and many urban trees in the HRM were also heavily affected. Additionally, some HRM residents (including those from the Sheet Harbour area) are concerned that clear-cutting continues to threaten the visual resources and ecosystem health of the region. Other residents expressed concerns relating to conflicting uses of forest lands, including the use of forestry roads by ATVs (particularly on haul roads) and safety concerns presented by conflicting usage of areas by recreational trail users and lumber trucks. Well-signed access restrictions in these areas may reduce these conflicts, provided enforcement is ensured.

In light of these issues, and the increasing demand for forest products, DNR and the forestry industry have undergone a significant transition towards ecosystem based management. Sustainable forestry strategies were implemented in 2005 including amendments to the *Forests Act* and the enactment of Registration and Statistical Return Regulations, Forest Sustainability Regulations, Wildlife Habitat and Watercourses Protection Regulations, the Code of Forest Practice principles, and the establishment of a Forest Technical Advisory Committee (Nova Scotia Department of Natural Resources 2008). At the same time, Integrated Resource Management (IRM) planning is creating the shift to ecosystem-based management on Crown lands (Nova Scotia Department of Natural Resources 2008). Ecological land classification systems and management guides for both public lands and private woodlot owners have been developed to initiate this process.

Map 35. Forestry – Softwood Land Capability



With the rapidly increasing demand for soft wood forest products, and the termination of the federal-provincial silviculture funding agreements in 1995, long-term wood supply sustainability became a major issue in the province (Nova Scotia Department of Natural Resources 2008).The Province has reaffirmed a private land silviculture program implemented by the forestry sector aimed at achieving long-term wood supply requirements through sustainable forest management.

3.2.3.2 Ownership and Management

In Nova Scotia, 65% of forested lands are privately owned and 50% are small privately owned woodlots, each of which are in different states of management (Bishop 2015). Small and large private woodlot management in the HRM offers significant potential to contribute to increased production. The forest industry includes Christmas tree growers; harvesting; trucking and silviculture contractors; maple product producers; pulp and paper mills; and sawmills (Bishop 2015). Given that a significant proportion of forest lands are operated by private woodlots owners, DNR has provided several resources to promote sustainable land management and an ethic of stewardship on these privately owned lands. Private land owners are not required to have a management plan to harvest their woodlots for non-commercial energy use (Nova Scotia Department of Natural Resources 2010). However, the DNR Private Lands, Stewardship, and Outreach Division provides opportunities to woodland owners to learn, share, and exchange various woodlot management techniques through woodlot education programs (Nova Scotia Deparment of Natural Resources 2013).

The Woodlot Management Home Study Program is distributed by DNR to promote stewardship on privately owned woodlots. It includes a series of modules on topics relating to woodland stewardship and sustainable land management.

In addition to education programs, DNR coordinates the implementation of forest management programs on private lands and engages woodland owners in making positive economic, social, and environmental contributions to the province (Nova Scotia Deparment of Natural Resources 2013). Coordination of the HGNP objectives with these efforts is important.

The move towards independent certification of forest lands in Nova Scotia has expanded rapidly since 1995. Forest certification has become the new imperative to achieve recognition of sustainable forestry practices, and to practice sound environmental management of forested land. Currently, three certification systems exist: the Canadian Standards Association (CSA), the Sustainable Forestry Initiative (SFI), and the Forest Stewardship Council (FSC). Many woodlot owner groups are either working towards Forest Stewardship Council (FSC) certification or participating in the development of the Pan-Canadian Standard for acceptance by the other three systems.

3.2.3.3 Community Forests

Community management of forests offers a new and creative approach to managing forest resources on Crown lands. Allowing local communities to manage forests on Crown land may provide opportunities for local oversight and stewardship, while ensuring jobs are close to home, and that economic benefits stay in the community.

Provincial governments sign agreements with community groups to manage their local forests. Groups that manage community forests often pursue their own goals: starting businesses related to forestry, creating opportunities for ecotourism, and offering educational programs (Nova Scotia Department of Natural Resources 2015).

A prime example of an educational resource for sustainable forestry in the Acadian Forest is the Otter Ponds Demonstration Forest (OPDF). Operated as a division of the Nova Scotia Woodlot Owners and Operators Association, the OPDF is a place where people can learn about forest ecology and the sustainable management of native Acadian Forest. OPDF is managed by a unique partnership that includes four non-governmental organizations, a forestry company, and the province. The partners jointly manage a 500-hectare (1,200-acre) Crown parcel near Mooseland within the HRM. In light of its success, the OPDF is an excellent model for future community forests as a part of a working landscape in a green network.

The province is also exploring opportunities for a Mi'kmaw forest initiative with the Assembly of Nova Scotia Mi'kmaq Chiefs. There may be additional opportunities within the HRM for further collaboration with First Nations with respect to forestry.

3.2.4 Fisheries and Aquaculture

KEY ISSUES

- Public concern over environmental impacts of commercial aquaculture sites.
- Decreased catches of commercial species, and drop in market value of these.
- Ingress of introduced species of sport fish such as smallmouth bass and chain pickerel, and associated displacement of native salmonid populations.
- Water quality and biodiversity concerns highlight the need to work closely with aquaculture industries to mitigate impacts to streams, lakes and coastal areas.
- Public concern over socio-cultural conflicts requires a broader coastal management approach to balancing economic development aquaculture activities) with other economic and community objectives.

KEY OPPORTUNITIES

- Increased prevalence of new markets for species such as rockweed (***Ascophyllum nodosum***).
- Potential for expansion of shellfish aquaculture industry.
- Implementation of new regulatory framework, per the 2014 Doelle-Lahey report.

3.2.4.1 Commercial Fisheries

The commercial fishing industry (both harvesting and processing) is a major source of both direct and indirect employment. It is also the economic mainstay of many rural communities within the Halifax region (Gardner Pinfold Consulting 2013). Major commercial fisheries exist along the coastal zone, including those for:

- Groundfish: e.g., haddock, cod, halibut, redfish, pollock, silver hake, American plaice, yellowtail flounder, winter flounder, grey sole, white hake, turbot, cusk, catfish, Atlantic Wolffish, and monkfish;
- Pelagic fish: fish dwelling neither close to the bottom nor near the shore e.g., herring, tuna, swordfish, and mackerel; and
- Invertebrates: e.g., lobster, snow crab, shrimp, scallops, clams, etc.

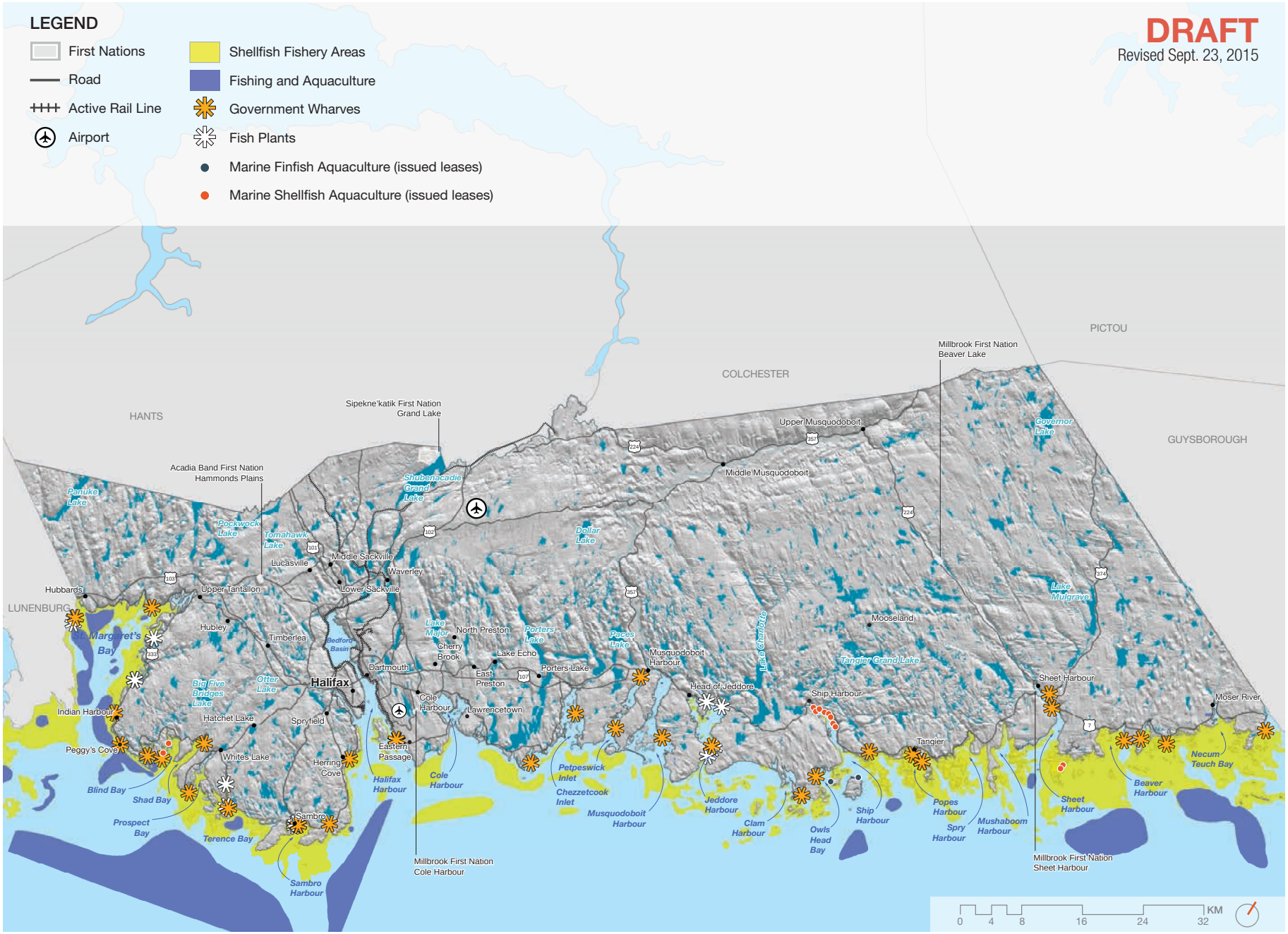
The majority of recreational fisheries are restricted to inland waters such as rivers, lakes, and estuaries, with primary sport fishing species including Speckled, brown, and rainbow trout, Atlantic salmon, smallmouth bass, and chain pickerel. A number of lakes within the Halifax region are stocked by the Province with rainbow and speckled trout, both in the spring and fall with. Mi'kmaq have a treaty right to fish for a moderate livelihood throughout the Halifax region, as well as treaty rights to fish for food, social and ceremonial purposes.

3.2.4.2 Recreational Fisheries

The majority of recreational fisheries are restricted to inland waters such as rivers, lakes, and estuaries. Primary sport and recreational fishing species include:

- Speckled, brown and rainbow trout;
- Atlantic salmon;
- Smallmouth bass;
- Chain pickerel; and
- Clamming and shell-fish harvesting.

Map 36. Aquaculture and Fisheries



3.2.4.3 Aboriginal Fisheries

The Mi'kmaq have a treaty right to fish for a moderate livelihood throughout the Halifax region, as well as treaty rights to fish for food, social, and ceremonial purposes.

3.2.4.4 Aquaculture

Province-wide, the aquaculture industry is diverse and includes both marine and land-based operations. Within the Halifax region, specifically, a number of aquaculture facilities for shellfish, finfish and marine algae exist in various areas, including:

- Ship Harbour: Blue mussel, sea scallops, European oyster, American oyster, Atlantic salmon, rainbow trout;
- Sheet Harbour: American oyster;
- Prospect Bay: Blue mussel; and
- Blind Bay: Blue mussel, sea scallop, European Oyster, Dulse.

While the industry has largely stalled over the past decade, the aquaculture industry seems poised for growth in certain areas, particularly for shellfish. However, the regulatory framework for aquaculture in the province has been outpaced by the growth of the industry; consequently, the Province has initiated the process towards implementation of a new regulatory framework for the aquaculture industry. The intent of this framework is to provide an effective regulatory mechanism, while balancing the interests of industry, the environment, communities, and other marine (non-aquaculture) users. The Nova Scotia Department of Fisheries and Aquaculture established an independent panel composed of Drs. Meinhard Doelle and William Lahey of Dalhousie University to develop this framework. The results of this process were released in 2014 (Doelle and Lahey 2014).

Development of aquaculture operations are a controversial topic Province-wide. There is often a community perception that the industry is largely unregulated, and that the Provincial Department of Fisheries and Aquaculture has a conflicted stance as both promoter and regulator of the industry. The Province recently rejected a 2013 application for a new salmon aquaculture site in Shoal Bay, near Sheet Harbour, after a rigorous 22-month-long review process. Fisheries and Oceans Canada raised concerns about the proposed site's potential impact on wild salmon populations. It indicated that the site represents a "low risk to fish habitat" but a "moderate risk to wild Atlantic salmon." It was the first time that Fisheries and Oceans Canada has described a proposed aquaculture site as a "moderate risk" to wild salmon.

3.2.5 Hunting and Gathering

KEY ISSUES

- The Halifax regional landscape is highly productive in terms of huntable / trappable species and harvested flora.
- The activities are important in terms of recreational opportunities and food source supplementation.
- Wild harvesting areas need to be sustainably managed in terms of habitat production as well as public use and access.
- The cultural significance and access to First Nations traditional use areas. These areas have ***not*** been mapped.

KEY OPPORTUNITIES

- Identification, protection and sustainable management of key hunting and wild harvesting areas.
- Identification, protection and sustainable management of key coastal harvesting, marine fishing areas, and fresh-water fishing areas.
- Ensure adjacent and upstream land uses do not negatively impact harvestable species.
- Work with First Nations to identify traditional use areas.
- Work with DNR to identify important hunting and gathering areas.

GENERAL DISCUSSION

Hunting and gathering has long been part of the heritage and culture of Nova Scotia. Self-sufficiency and reliance on native foods from the land has a long tradition in the region, stretching back to before the early European settlements. Today, there is a strong recreational sector and informal food economy based on hunting and gathering. Self-sufficiency efforts by individuals, such as hunting, wild harvesting, and fishing remain popular activities in the region. Appropriate and sustainable access to hunting and gathering areas is important to manage in the context of the HGNP.

Wild harvest areas are extensive in the region, including forests and bogs. In addition to game, they are sources of mushrooms, marsh greens, fiddleheads, and various berries. Shellfish harvesting and mackerel fishing in coastal areas, as well as freshwater fishing on the region's lakes and streams contribute to recreation and the informal food economy.

Seasons are established for moose, deer, bear, snowshoe hare, ring neck pheasant, ruffed grouse, and waterfowl. Seasons are also established for snaring and trapping of furbearers. Archery, crossbow, and muzzleloader seasons are established for some areas allowing for diversity of experience, management of species, as well as the potential for greater safety in areas nearer to development. All of the harbours along the Eastern Shore have waterfowl habitat accessed by hunters but Cole Harbour, Cheezacook, Pepeswick, and Musquodoboit are particularly important. Many of areas and activities hold important traditional use significance for First Nations people.

3.2.6 Utility and Transportation Infrastructure

KEY ISSUES

- While essential components of the HRM, utility and transportation corridors can impact wildlife movement, and water quality and quantity, as well as cultural assets and the landscape aesthetic.
- Transportation corridors are often solely focused on vehicles rather than active transportation, stormwater management, and pedestrian use.
- Tree pruning and vegetation management in power corridors is a necessity to ensure utility reliability and general public safety.
- Conflicting land uses and land / ecological fragmentation are often side effects of major, critical transportation infrastructure, such as the airport and harbours.

KEY OPPORTUNITIES

- Protect future utility and transportation corridors for future development.
- Ensure visual resources, aesthetics, and cultural resources are considered in the development and ongoing maintenance of urban and rural utility and transportation corridors.
- Coordinate utility and transportation infrastructure investments with active transportation.
- Consider multiple uses for utility corridors, e.g. community gardens, berry farming, Christmas tree farms, stormwater management, dog parks, etc.
- Ensure that landscape connectivity, as well as wildlife mobility and mortality, is considered in the location and design of transportation corridors.
- Build wildlife over/under passes across major transportation corridors in key wildlife corridors.
- Use well-vegetated utility corridors to supplement wildlife connectivity through heavily altered landscapes.
- Develop utility planting and maintenance plans for key corridors that preserve community character, while also ensuring safety and utility function.
- Provide multi-use corridors wherever possible in order to reduce footprint and impacts.
- Protect and integrate large areas for essential infrastructure that can be interwoven with the ecological and connectivity network to help mitigate the conflicting land uses.

GENERAL DISCUSSION

Utility and transportation corridors, for current and future use, are strategically important to the HRM. However, infrastructure corridors may have large impacts on ecological function, connectivity, aesthetics, and recreational use of open space. Utilities (i.e., water, wastewater, stormwater, electricity, natural gas, and telecommunications) and transportation corridors often fragment the landscape and create barriers to water flow, wildlife species, and people. Well planned and integrated utility and transportation corridors can serve multiple purposes, providing critical infrastructure while also functioning as recreational and ecological corridors.

3.2.6.1 Utility Corridors

Six utilities – water, wastewater, stormwater, electricity, natural gas, and telecommunications – require corridors, and are often contained within one utility corridor. Halifax Water is the municipal water, wastewater, and stormwater utility for HRM residents. Roughly 82% of the population (comprised of the Halifax Regional Centre and surrounding suburban areas) is connected to the municipal system, resulting in 1,556 km of water pipes, 2,191 km of wastewater and stormwater pipes, and 600km of ditches (Map 37). Those not connected to Halifax Water (i.e. the rural population) rely on on-site sewage disposal or private companies, and rely on groundwater supplies, water service from neighbouring municipalities, and private entities for potable water.

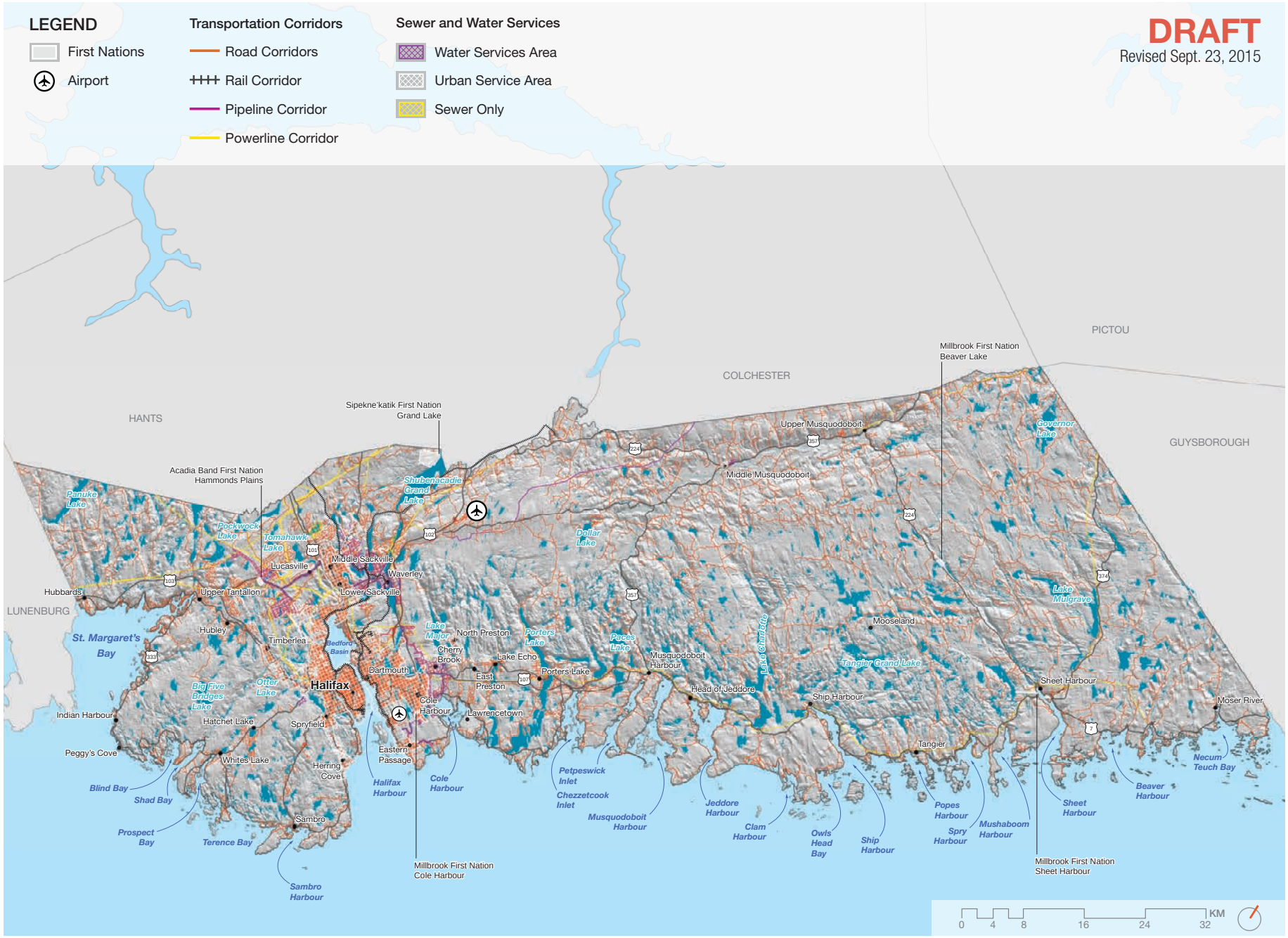
Some areas in Downtown Dartmouth and Halifax already have underground electrical and telecommunication lines, and various efforts have been made to increase the number of underground utilities, including cost-sharing with developers and new regulatory requirements were introduced into the Regional Subdivision Bylaw in 2014. However, underground electrical utilities are not widespread in the HRM. Provided by Heritage Gas, natural gas service exists primarily in the urban areas, though efforts are underway by the HRM to continue the expansion of natural gas infrastructure for increased access for both residents and businesses in urban communities (Halifax Regional Municipality 2014). Coordination between Halifax Water and the HRM will be vital to integrating utility corridors with the green network. This will be especially important for stormwater management and electrical / telecommunication lines, as these are best suited for integration with trails, ecosystems, and recreational open spaces.

3.2.6.2 Transportation Corridors

According to the 2013 Quantifying the Costs and Benefits of Alternative Growth Scenarios, there are 159 km of rural roads and 1,981 km of urban roads in the HRM. Of these, the 100-series highways within the HRM (Highways: 101, 102/ Bicentennial, 103, 107, 111/Circumferential, and 118) define the major growth corridors for the Region (Map 37). The Province is currently planning two major new roadways for the region, which could have substantial impact on wildlife corridors and other existing open spaces (Stantec Consulting Ltd. 2013):

- Burnside Bypass, a major extension to Highway 107 that would run through an area owned by the Department of National Defence that currently has active quarrying and is still used to store ordnance by the military.
- Highway 113, a connection from Highway 102 to Highway 103 that would run through the Blue Mountain – Birch Cover Lakes Wilderness Area, untouched woodland and barrens. This project has been approved, with conditions. (Government of Nova Scotia 2014)
- Halifax Transit transports more than 100,000 Haligonians daily, with more than 300 buses and Access-A-Buses servicing over 60 routes, and four passenger ferries servicing two Halifax Harbour routes. Over the past few years, Halifax Transit has been in the process of creating a new vision and plan for transit in the HRM through the Moving Forward Together Plan.

Map 37. Utilities and Road Corridors



Planning for existing and future road infrastructure has the opportunity to support the open space network through the advancement and integration of active transportation and increased connectivity for people and wildlife, with coordinated investments in bridges and underpasses. Additionally, coordination with Halifax Transit could provide opportunities to improve public transit access to open spaces that strengthen both the HGNP and the Moving Forward Together Plan.

3.2.6.3 Major Transportation Infrastructure

Throughout the HRM there are several types of industrial uses that are open space dependent; uses such as the airport and working harbour that require large open areas to operate. As critical infrastructure, these areas are limited by appropriate siting locations, within pre-established areas, and/or with their own set of associated regulations and restrictions. Representing large land areas, these uses can create major gaps in connectivity and the open space network. As such, measures should be taken to both protect and conserve these areas as critical infrastructure for the region, but also, when possible, integrate these spaces with the larger ecological system and connectivity networks of the HGNP.

3.2.7 Tourism

KEY ISSUES

- In the past 10 years, tourism visits to Nova Scotia have declined by 9%, while global travel continues to grow (Nova Scotia Tourism Agency 2013). Indicators for the region show a greater decline in tourism in the Eastern Shore (Tourism Nova Scotia 2015).
- Mining, aggregate, forestry, and aquaculture activities have the potential to negatively affect tourism activities by degrading the scenic landscape, interfering with recreational opportunities and/or affecting ecosystem health. Tourism depends on a landscape context with healthy ecosystems and scenic landscapes that provide recreational opportunities.
- Linear development along scenic travel ways is affecting the visual quality of the corridors. A few misplaced developments can have a high impact by negatively affect the sense of place and lessening tourism attraction.
- Development that supports increased tourism, if not wisely managed, could threaten the very reasons why visitors are attracted to the region (e.g. inappropriately implemented development in small villages can greatly affect the character of the place).

KEY OPPORTUNITIES

- Tourism is an important sector of the regional economy. The open space network, properly managed and promoted, can greatly contribute to the sector.
- Tourism could be enhanced by the development of a more extensive and improved trails and routes system (hiking, cycling and paddling) including the Blue Route (provincial network).
- A clearly identified, protected and promoted green network of natural, recreational, cultural and agrarian landscapes, providing a range of opportunities is key to attracting and maintaining tourism.
- Agri-tourism is an important, but underdeveloped, economic opportunity.
- Nature-based recreation infrastructure could be improved (e.g. trails and campgrounds).
- The 'Bay of Islands' destination area project in the Eastern Shore has potential to increase tourism and enhance the economy.

GENERAL DISCUSSION

In 2013, the tourism industry in Nova Scotia generated over $2.3 billion in revenue in 2013 (Tourism Nova Scotia 2015). While this represents only 2% of the provincial economic activity it is important to major urban centres, as well as for many remote communities, an estimated 63% of the total spent in NS directly benefits the Halifax region. As such, there is significant benefit to investing in tourism-related resources in the region and, if properly managed and promoted.

Initiatives occurring provincially and locally include:

- The Blue Route is a provincial cycling route network. The project is at an early stage. The region would be at the intersection of three cycling routes.
- In the Eastern HRM Strategic Planning Report (2014), tourism is identified as one of the strategic priorities. While strategic planning for tourism is at an early stage, cultural tourism (arts and crafts, seafood festivals, etc.) and nature-based tourism (cycling, fishing, boating and marina, and other nautical activities) have been identified as potential segments and products.
- 'Bay of Islands' Coastal Heritage Destination Area (2013) (proposal by the Lake Charlotte Area Heritage Society and led by the Nova Scotia Nature Trusts mentioned in the Eastern HRM Strategic Plan).

Destination Marketing Organizations exist for all parts of the province and is undertaken by zone. In HRM the South Shore (Chebucto Peninsula to Hubbards) is covered by the Destination Southwest Nova Scotia; Halifax is covered by Destination Halifax; and the Eastern Shore by (Destination Eastern and Northumberland Shores). The Nova Scotia Tourism Strategy (2015) states that the main market is "the outdoor enthusiast", not the extreme adventurer but the "soft adventurer", who appreciates local culture and cuisine after a day spent hiking or whale watching. This suggests that a plan that puts a high value on greenspace, and coastal and cultural assets, which are key strengthens in the region, will be well placed to benefit from the development of tourism. As such, there is significant opportunity to enhance tourism revenues through the provision of coordinated trails, waterways, and coastal activities, as well as agri-tourism, which represents an emerging subset of the current tourism industry and offers a great potential to diversify the visitor experience.

Tourism operators and organizations operating in the HRM include:

- Atlantic Canada Opportunities Agency (ACOA) (Provincial)
- Nova Scotia Tourism Agency (NSTA) (Provincial)
- Destination Halifax (DH)
- Destination Eastern & Northumberland Shores (DEANS)
- Destination Southwest Nova Scotia Association (DSWNA)
- Seaside Tourism and Business Association (STBA)
- St. Margaret's Bay Regional Tourism Development Association (Peggy's Cove Coastal Region destination area)
- Musquodoboit Valley Tourism Association (MVTA)

3.2.7.1 Nature Based Tourism

Nature-based ecotourism relies on experiences directly related to the natural environment, which includes camping, hiking, bird watching, whale watching, fishing, beach recreation, canoeing, kayaking, etc. It benefits local communities environmentally, culturally and economically.

With its 2,017 km of coastline, numerous pristine lakes, significant coverage by protected areas (parks and protected areas), and over 500 km of designated trails, the region has tremendous opportunities for outdoor recreation. There is a strong link between the vitality of the tourism industry and the preservation of healthy ecosystems and scenic landscapes.

3.2.7.2 Cultural Tourism

Cultural tourism includes all aspects of travel where visitors are motivated by learning about history, art, and the community's way of life and sense of place. With its rich history and authentic coastal lifestyle, the region has a myriad of cultural tourism opportunities including museums, historic sites, festivals, and events. While a large proportion of the cultural tourism offered is located within the Halifax/Dartmouth area, rural areas abound with cultural attractions. For example, small fishing villages, which are part of the cultural identity of the region, are important tourism destinations. With increased visitation and development pressure, these villages are challenged to maintain their character.

3.2.7.3 Agricultural and Culinary Tourism

Agricultural, or agri-tourism, and culinary tourism is based on scenic agricultural landscapes with opportunities to visit producers, to taste or purchase local products, and/or to stay on farms and participate in farm activities. While not promoted exclusively as an agri-tourism destination, the Musquodoboit Valley

supports many agriculture related attractions and events (farmer's markets, open farm days, berry picking, Christmas trees cutting, HRM fairs, etc.). The community is assessing the potential to develop the area as a tourism destination (Musquodoboit Valley Planning Committee 2014).

Agri-tourism and culinary tourism are strongly linked. The province has a rich culinary tradition influenced by the land, the sea and the many cultures that have settled in the area. 'A Taste of Nova Scotia' is a member based organization (producers,) which promotes the unique quality of Nova Scotia food and beverage products. The province has emerged as a culinary tourism destination. There is an opportunity to increase culinary tourism in the context of visually attractive, productive agrarian landscapes supplemented by local processors, and restaurants. There are also many wineries. While they are not located within the HRM (Annapolis and Gaspereau valleys), they are within a short day trip and represent a promotional opportunity within the Metro area.

3.2.7.4 Tourism Destination Areas

Tourism destination areas include the communities, clusters of activity opportunities, and circulation corridors in an area that is central to the decision to take a trip. The province of Nova Scotia is divided into seven tourism regions, three of which are located in the HRM: Halifax Metro, South Shore, and Eastern Shore. Note that tourism regions do not reflect municipal boundaries. Within these broader tourism regions are four distinct destination areas: Halifax/ Dartmouth, Peggy's Cove/St. Margaret's Bay, Eastern Shore/Bay of Islands, and the Musquodoboit Valley. These destination areas are accessible via Scenic Travelways throughout the region.

3.2.7.5 Scenic Resources and Scenic Travelways

The scenic resources of the HRM are some of the region's most distinctive and important assets and are significant to the enjoyment of the area by residents and visitors alike. The tourism industry is also heavily dependent on the maintenance of scenic integrity of the region. Many studies have demonstrated that the public perception of a landscape's inherent scenic quality correlates with the presence or obstruction of natural and cultural landscape features, such as water bodies and shorelines, vegetation pattern and composition, important cultural features, as well as measures of distance and visibility that frame scenic views (Purcell and Lamb 1998, Junker and Buchecker 2008, Garre, Meeus and Gulinck 2009, Herbst, Forster and Kleinschmit 2009)

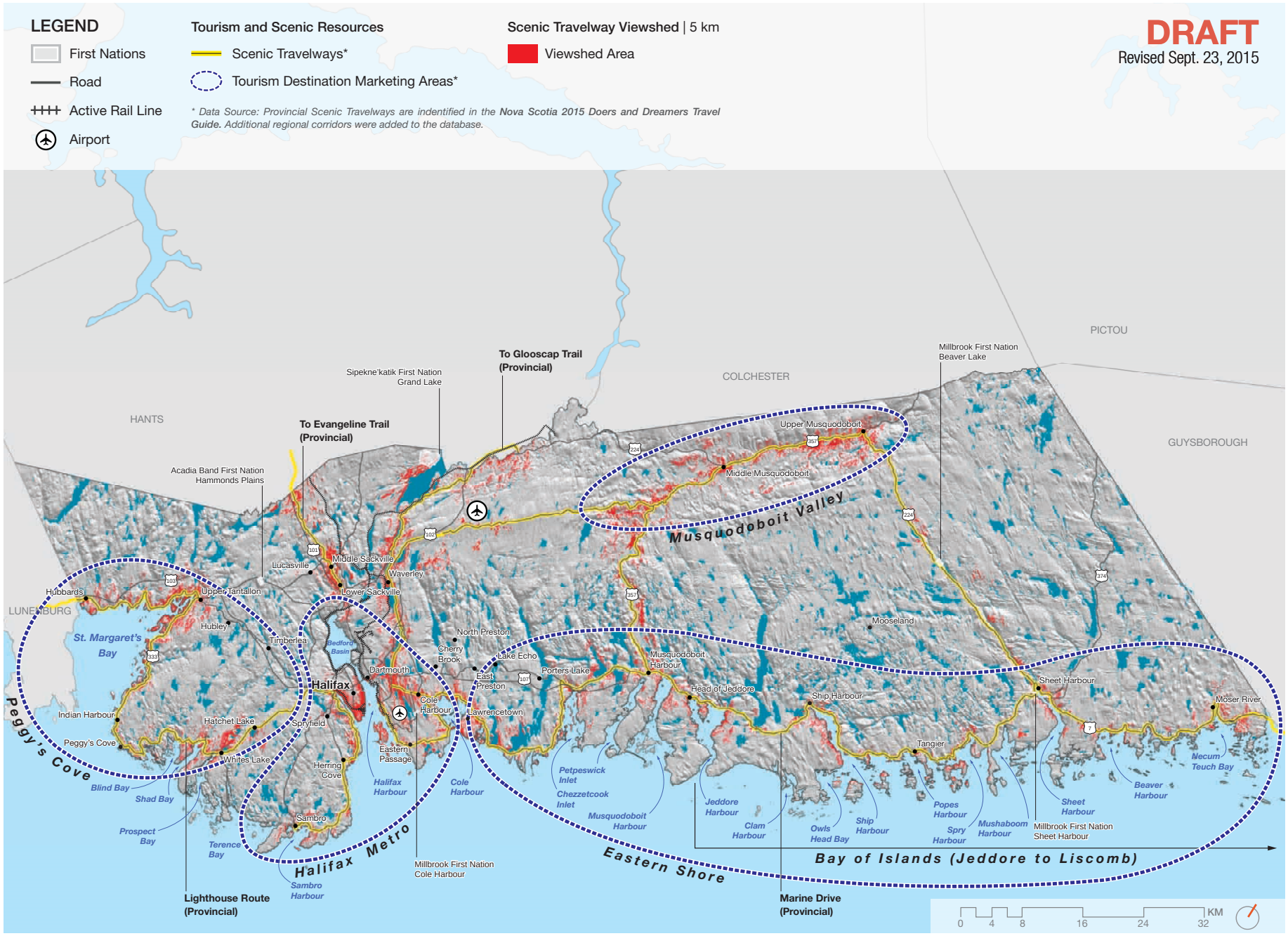
The province has identified a series of roads and highways, which offer scenic views and connect places across the province. Marine Drive and Lighthouse Route are "Scenic Travelways" that both end and begin in the Halifax/Dartmouth area and provide outstanding view of natural and culture feature. These roads in the HRM may also be considered destinations unto themselves. These roads provide views (among many others) to Halifax Harbour, the North West Arm, and the Long Hill view over Cole Harbour. Other Scenic Travelways provide coastal views of the coast, through the tourism regions of Peggy's Cove, the Eastern Shore, and the Bay of Islands. Other important scenic corridors include, Waverley Road and the road that runs through the tourism region of the Musquodoboit Valley. While an assessment of visual quality was beyond the scope of this study, a visibility analysis from Scenic Travelways was conducted. Map 38 identifies the visibility corridor along Scenic Travelways. Analysis of these maps show areas with high visibility to areas with a low visibility within a 5 and 10km distance from Scenic Travelways. Ten kilometer visibility was included as it encompasses view to many islands. Visibility refers to the overall landscape view, or viewshed, that can be seen from a particular vantage point. Scenic Travelways were selected as vantage points for the viewshed analysis because they experience the highest use volume. These areas are most often affected by roadside signage, development, and other amenities that may directly enter into the view of a travelling car. In general, views are negatively affected by physical development that is inconsistent with the visual or cultural character of the landscape.

Areas with the highest visibility in the HRM occur around the Bedford Basin and harbor area, which provide views of the North West Arm and Halifax Harbour. Other locations of high visibility include McNab's and Lawlor's Island Provincial

Park, which provides scenic views of Halifax Harbour and the sea. The coastline surrounding St. Margaret's Bay, as well as the river valley located east of Shubenacadie Grand Lake are also areas of high visibility. Other areas of high visibility identified in the analysis and verified by HRM residents include Piggy Mountain in the Williams Lake Backlands, with its clear views of Chebucto Head and peninsular Halifax, and the southwest corner of the Terence Bay Wilderness Area which provides scenic ocean views from the barrens and cliffs.

In addition to these designated Scenic Travelways are roads that link tourism destinations. These Travelway corridors include the road or highway right-of-way as well as the adjacent area that is visible from the highway. In most cases, the Scenic Travelways also function as important access corridors into and through the region. There are over 600 km of Scenic Travelways throughout the region including Road 212 within the Musquodoboit Valley, Road 224 connecting Upper Musquodoboit to Sheet Harbour, and Road 349 to Sambro. Corridor Management Plans may be needed for these scenic and corridor routes in order to specify the controls, guidelines and administrative strategies that will maintain their scenic, historic, recreational, cultural, and natural qualities.

Map 38. Tourism Destination Areas and Scenic Travelways



3.3 RECREATION AND TRAILS

Values: Connected parks, wilderness areas, and trails provide a wide range of recreational and active transportation opportunities within reach of communities, which can help promote active lifestyles, contribute to quality of life, and stimulate economic investment.

3.3.1 Provincial Parks, Protected Areas, & Regional Parks

KEY ISSUES

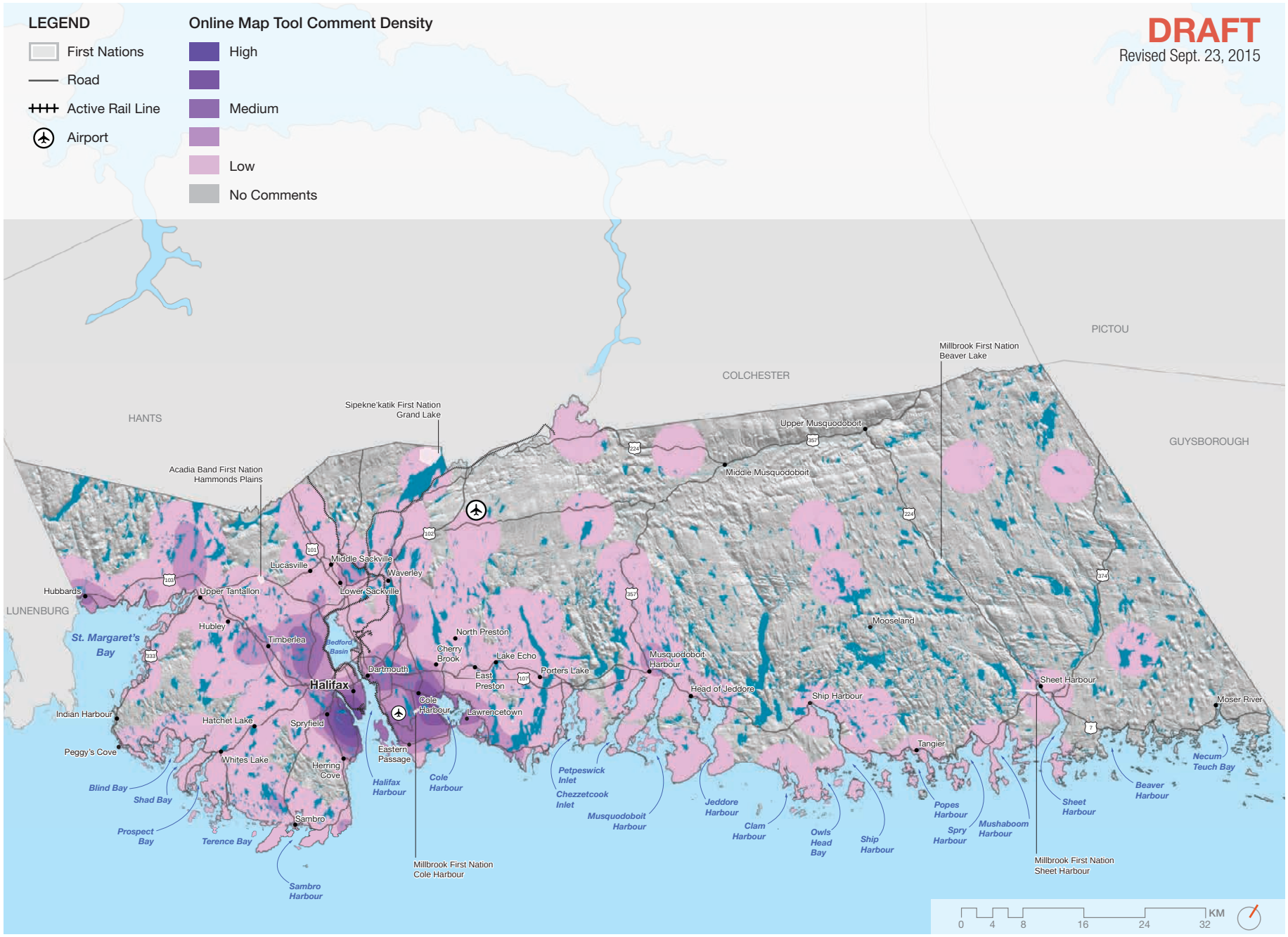
- Development aspirations in some areas are at cross purposes with desired future regional parks.
- The impact of high visitation levels in some regional parks is degrading visitor experience.
- Uncontrolled off-leash dogs in some regional parks cause conflicts with other users, as well as impact wildlife.
- Park amenities and facilities, such as trails, day use areas, washrooms, shelters, and signage are limited in Regional Parks and in some cases, do not meet demand.
- Many beaches are overcrowded.
- Many trails are overused.
- Camping facilities and trails in Provincial Parks are limited.
- Developed Private lands adjacent to or within some parks and protected areas may restrict public access and reduce wildlife connectivity.
- The connectivity to and between parks and protected areas needs to be maintained and in some cases enhanced.

KEY OPPORTUNITIES

- Expand the regional parks network by focusing on large pristine natural areas rather than small isolated parcels.
- Ensure that the designation of future parks and connecting corridors is carried out prior to other development applications and land use re-designations. Though this may not always be the best option.
- Develop new park establishment criteria that include, but are not limited to, natural feature representation, protection of valued landscape elements, maintenance of landscape connectivity, community access to parks, and level of service in catchment areas.
- Improve access to and between parks for multiple transportation modes (cycling, biking, walking, and transit).
- Ensure long term species movement between parks through the protection of well-vegetated and riparian corridors, as well as maintenance of naturally vegetated stepping stones and large forest patches (matrix connectivity).
- Enhance park amenities and facilities that support year round recreational activities. Where it's appropriate. This may not necessarily be the direction that HRM wants to go in all parks – some parks need "rest" over the winter.
- Increase overnight camping opportunities in parks. In specific areas within designated "camping" parks.
- Improve park management response to conflicts or degradation issues.

The Province has recently increased the protection of the lands to 13% of the province by 2015 (Province of Nova Scotia 2013). Within the HRM, the majority of the additional protected areas included the establishment of new designated areas (44,644 ha) as well as the expansion of existing protected areas by 8,186 ha. New nature reserves accounted for 2,405 ha, while proposed wilderness areas added 24,348 ha. No new provincial parks or expansion of existing provincial parks are planned for the region. The Parks and Protected Areas percentage of the region is now 100,632 ha or 17% of the Region (Table 7).

Map 39. Density of Online Public Comments – Recreation and Trails



Map 40. Parks and Protected Areas

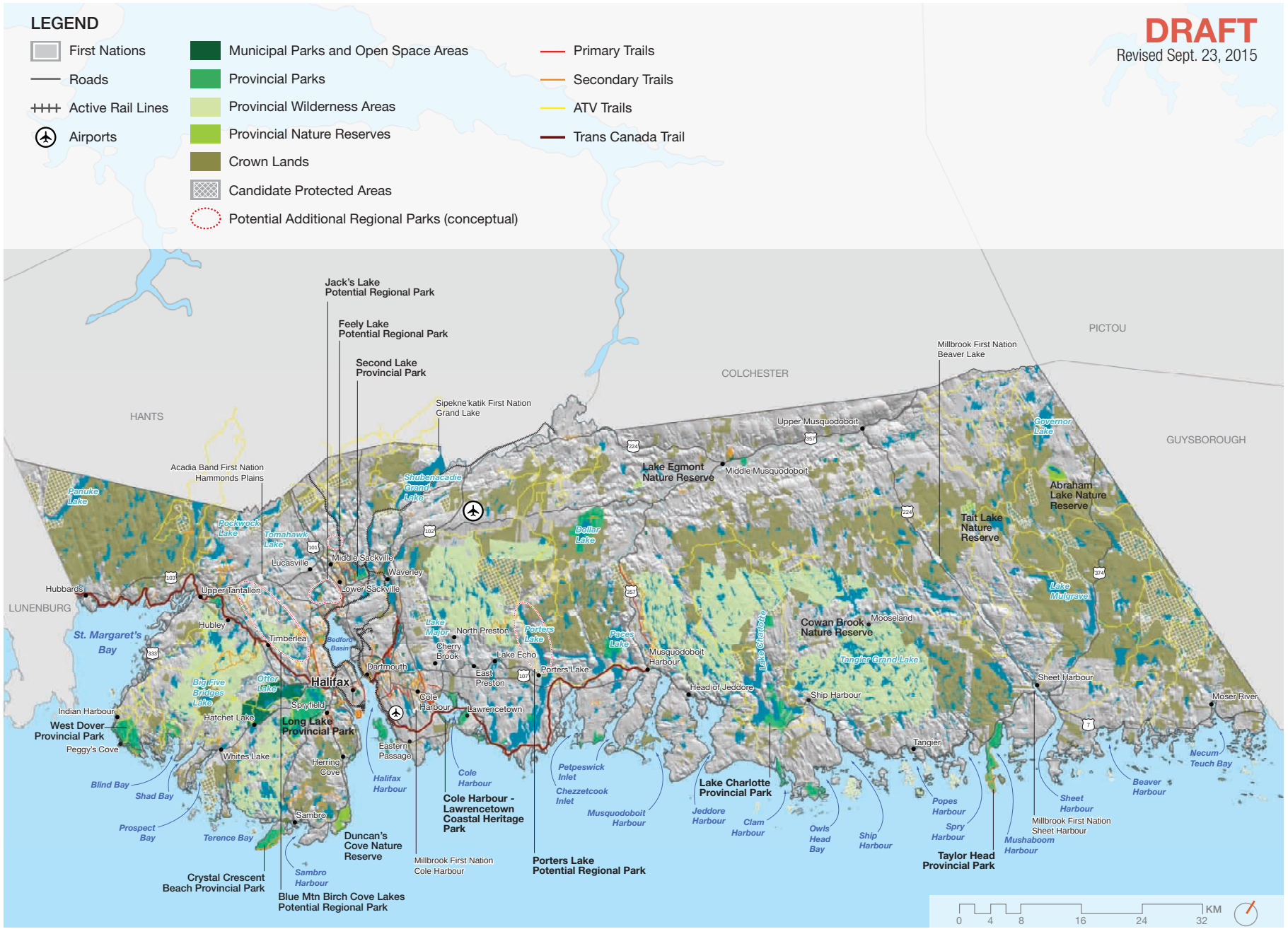


Table 7. Provincial and Municipal Parks and Protected Areas Classification System

	Class	Description	#	Areas	% of HRM
Provincial	Nature Reserves	Nature Reserves offer the highest level of protection for unique or rare species or features. They are mostly used for education and research purposes.	5	1,115 ha	0.19
	Wilderness Areas	Wilderness Areas protect nature and support wilderness recreation (i.e. hiking, canoeing, skiing, bird watching and paddling), hunting, sport fishing, trapping, and other uses.	17	61,598 ha	10.4
	Provincial Parks	Provincial parks protect nature and support a wide range of heritage values and opportunities for outdoor recreation, nature-based education, and tourism.	43	10,092 ha	1.7
	Candidate Provincial Protected Areas	Candidate provincial and protected areas are lands considered to be legally protected by addition, expansion of existing protected areas or transfer of provincial parkland to protected areas, as part of the 'Our Parks and Protected Areas' plan.	49	21,686 ha	3.7
HRM	Regional Parks	Regional parks preserve and protect significant natural or cultural resources. They may be federal, provincial or municipal properties and are intended to serve the educational, cultural and recreation needs of the population of the entire region as well as for visitors to HRM.	46	3,581 ha	0.6
	District Parks	District parks provide amenities and facilities for passive and active recreational activities. They may include areas that are left in a predominantly natural state.	81	524 ha	0.08
	Community Parks	Community parks provide amenities and facilities for organized youth and recreational adult level sports, and may also include facilities for play by children.	431	1,238 ha	0.2
	Neighbourhood Parks	Neighbourhood parks provide amenities for passive activities and facilities for play by children.		204 ha	0.03
Nature Trust	Nature Conservancy of Canada + NS Nature Trust lands	Conservation lands are significant natural areas protected through acquisition and conservation easements.	38	594 ha	0.1
TOTAL	All Parks and Protected Areas			100632 ha	17

*Shaded classes are not assessed in this section of the SOL, but are discussed in Section 3.4.4.

Online public consultation has provided a useful overview of the areas which have been publicly identified as important, valued, or at risk (Map 39). This section focuses on provincial parks, protected areas, and regional parks that offer recreational opportunities in a natural setting. With the exception of total area calculations (presented below), urban parks, including neighbourhood, community and district parks, are discussed in the Communities Section (3.4). Table 7 presents the current Provincial and Municipal Parks and Protected Areas Classification System.

3.3.1.1 Wilderness Areas and Nature Reserves

Wilderness areas are provincially-significant areas designated under the *Wilderness Areas Protection Act* that protect representative examples of Nova Scotia's natural landscapes. While the primary purpose of a wilderness area is the protection of ecosystems, they also provide significant nature-based recreation opportunities. Activities such as hiking, paddling, skiing, and bird watching are encouraged. Sport fishing and the traditional activities of hunting and trapping are generally permitted, while the use of vehicles is restricted and must be authorized.

Wilderness areas are managed by the Protected Areas and Wetlands Branch of Nova Scotia Environment, and enforcement and field services are provided by the Department of Natural Resources (DNR). The management of trails could be taken on by local community groups, which is the case for many of the wilderness areas in close proximity to the Regional Centre (e.g. Woodens River Watershed Environmental Organization/The Bluff Trail (WRWEO). However, many HRM residents feel that volunteers do not receive adequate support (HGNP – What We Heard Phase 1 Report).

Wilderness areas are popular destinations around the Regional Centre. Generally, developed areas are reasonably well served by a wilderness area within 25 km, refer to Map 41. Infrastructure in wilderness areas is generally limited to hiking trails, trailheads, and canoe portages. The following wilderness areas have designated trails: Five Bridges Lakes, Blue Mountain-Birch Cove Lakes, Waverley-Salmon River Long Lake, and White Lake. While designated for education and research purposes, the Duncan's Cove and Abraham Lake Nature Reserves also have many popular informal trails.

The Province has added three new nature reserves within the HRM since the adoption of the Our Parks and Protected Areas Plan: Cowan Brook, Lake Egmont, and Tait Lake. These small parcels are located inland. Place-specific recreational opportunities in wilderness areas include:

- Improved access to Terence Bay Wilderness Area.
- Additional amenities, such as hiking trails, in the southwest corner of the Terence Bay Wilderness Area.
- Create a recreational corridor from Terence Bay Wilderness Area to Five Bridges Lakes Wilderness Area.

3.3.1.2 Provincial Parks

There are 43 provincial parks within the HRM (1.7 % of HRM total area), offering a diversity of inland and coastal recreational opportunities. Infrastructure is limited in most Provincial Parks, and only three offer campground facilities: Dollar Provincial Park, Laurie Provincial Park, and Porters Lake Provincial Park. Porters Lake is the closest campground to the Regional Centre. The lack of facilities is influencing use of the areas. In addition to provincial campgrounds and the Shubie Park City Campground, eight private campgrounds are available throughout the region: Halifax West KOA, Woodhaven Park, King Neptune Campground, Hubbards Beach Campground, Wayside Camping Park, E&F Webber Lakeside Park, East River Lodge Campground & Trailer Park, and Spry Bay Campground & Cabins.

Coastal provincial parks, especially their beaches, are highly valued and often experience very high levels of use. Maintaining the balance between recreational use and the conservation of ecosystem elements and processes is challenging in many coastal areas where sensitive species habitats are, in some cases, threatened by beach recreational use (e.g. Piping Plover habitat). However, most people are willing to travel longer distance to access provincial parks that offer a wilderness experience, refer to Map 41. Place-specific recreational opportunities in provincial parks include:

- Improvements to camping facilities throughout all Provincial Parks in the HRM (e.g. Taylor Head Provincial Park) (What We Heard Report)
- Development of new Provincial Parks near Three Fathom Harbour and Rudaya Head (What We Heard Report)

3.3.1.3 Regional Parks

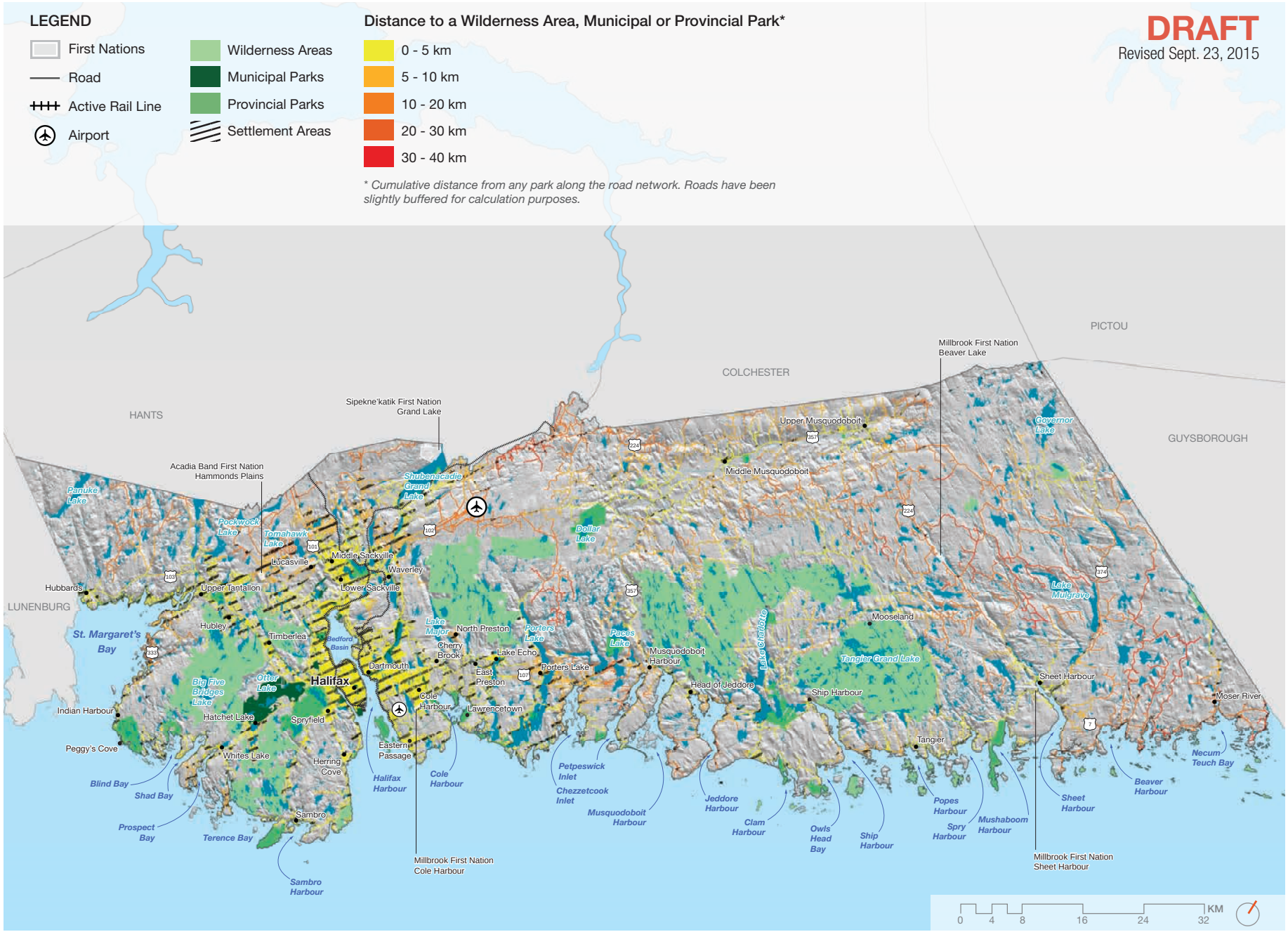
The regional parks system includes a wide diversity of parks ranging from small manicured parks within the urban core to large natural parks areas beyond the Regional Centre. This section focuses on regional parks that protect significant natural resources and offer nature-based recreation opportunities, such as the Western Commons and Sandy Lake. Regional parks within urban settlement areas are discussed in the Section 3.4 Communities.

Recognized for their scenic beauty, flora, fauna, recreational, archeological, historic or geological resources, many regional parks play an important role in the maintenance of the sense of place of the region (e.g. the cultural landscapes of Point Pleasant Park, Public Gardens, Grand Parade, Shubie Park, as well as the nature based parks listed below). The following regional parks offer nature-based recreation opportunities in a semi-wilderness environment:

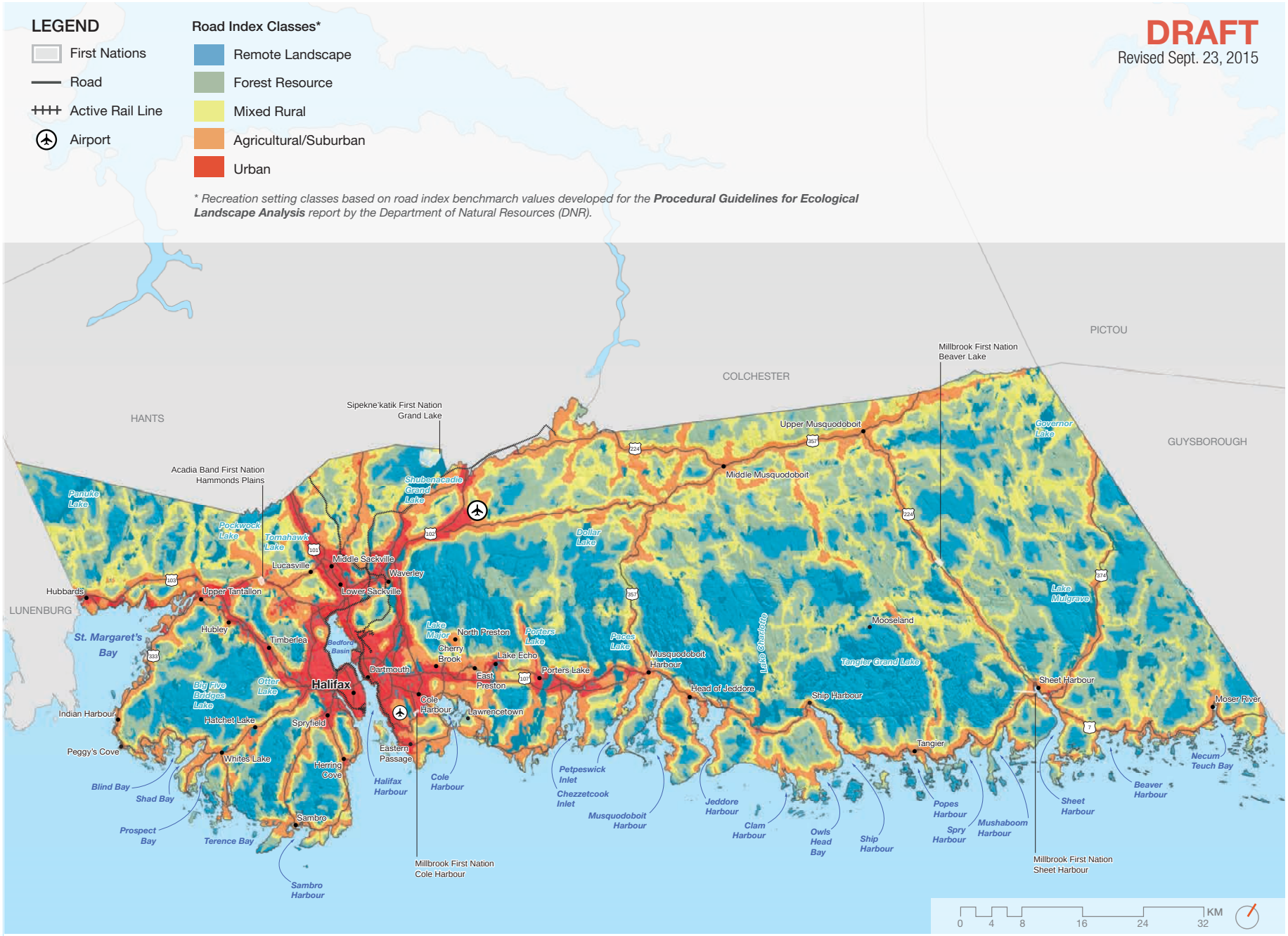
- **Western Commons Regional Park** is the largest regional park in the HRM (approximately 2,000 ha). The park is a gateway to the Chebucto Peninsula and an important staging area for travel to and from local communities, the Greenhead and Old Coach Roads. In close proximity to Long Lake Provincial Park (and Exhibition Park) Lands, there is potential for this park to be a part of an important corridor. The Western Common Wilderness Common Master Plan, approved in July 2010, defines the role of the park as providing regional outdoor recreation opportunities, such as cycling, hiking, paddling, ATV riding, and swimming, while serving needs of nearby communities. This Plan includes over 60 km of shared-use motorized, non-motorized, accessible and back-country trails. Other facilities include canoe launches and portage trails.
- **Oakland Provincial Park** is a small Regional Park is owned and maintained by the province. It is a popular destination on the Shubenacadie Grand Lake for swimming and boating and features trails, picnic areas, and boat launch.
- **Sandy Lake Park / Jacks Lake Park** is comprised of multiple parcels, largely connected, which total 106 ha of parkland. The Park includes hiking trails and is used for walking, swimming and mountain biking. The Regional Strategy calls for the development of a Regional Park at Jacks Lake (south of Sandy Lake).
- **Shubie Park** is a greenway corridor that protects a portion of the historic Shubenacadie Canal while offering a variety of outdoor amenities such as trails, beach, and canoe launch. The Shubie Park Campground is the closest campground to the Regional Centre.

In its 2014 Regional Strategy, the HRM identified its intention of creating additional Regional Parks at various locations throughout the region, refer to Map 41. These included Blue Mountain - Birch Cove Lakes, Feely Lake, Jacks Lake extension, Second Lake, and Porters Lake. Further analysis is required to determine the appropriate boundaries for some of these parks where there may be conflicting interests (i.e. Western Common, Porters Lake, and Blue Mountain-Birch Cove Lakes Parks). The establishment of rational criteria for boundary delineation is one of the many reasons that led to the development of the HGNP. Once appropriate boundaries are established, the lands will be zoned as a 'Regional Park' (Halifax Regional Municipality 2014).

Map 41. Distance to Wilderness Areas, Municipal and Provincial Parks



Map 42. Road Index



3.3.1.4 Diversity of Recreation Settings

The recreation setting is the context in which activities occur and is influenced by the spectrum of remoteness, naturalness, social and managerial characteristics of an area. The settings play an important role in visitor experience. At one end of the spectrum are settings that are highly developed (i.e. urban), with plentiful facilities and easy access, while at the other end, are settings that have little or no development (i.e. backcountry).

Analysis demonstrates the importance of maintaining a diversity of settings to ensure a variety of visitor experience. In the context of nature-based tourism, backcountry settings are important to provide authentic experience in nature. Developed by the DNR and based primarily on the density of roads and land uses, the road index (Map 42) provides a valid indication of the diversity of recreation settings, with "remote landscape" as the equivalent of a backcountry experience. The highlights of recreation settings analysis are:

- There are a few coastal areas that are not developed, therefore, few can be considered remote. Terence Bay and a few areas along the eastern shore offer a high level of remoteness.
- Many areas within or at proximity of the Regional Centre (as a Remote Landscape class) offer a backcountry experience on private and public lands, such as the Blue Mountain – Birch Cove Lakes and the Purcell's Cove Backlands area, Sandy Lake/Jack's Lake Park, Long Lake Provincial Park .

3.3.2 Recreational Trails and Active Transportation

KEY ISSUES

- Recreational trails and active transportation issues are related to: connectivity, access, user conflicts, trail types, amenities, governance, maintenance, and regulations and enforcement (see below for further details).
- The lack of detailed trail mapping, particularly non-designated trails throughout the region.

KEY OPPORTUNITIES

- Develop a comprehensive, recreational and active transportation trail system which:
  - Connects communities and destinations (parks, wilderness areas, community services, employment centres, schools, transit, popular tourism destinations, etc.);
  - Creates connections within and between communities;
  - Connects to other modes of transportation (e.g. ferry, transit, carpooling parking lot, etc.);
  - Offers a hierarchy of trail types and a range of trail experiences (on-road, off-road, on water, in nature, or in the city); and
  - Links the major trail systems (e.g. Rail to Trail) to local trails and destinations.
- A regional trail system, connected to the provincial 'Blue Route', has the potential to attract visitors and position the region as a cycling destination, as well as expand other nature-based tourism opportunities.
- Reuse ROWs; infrastructure and transportation corridors as well as forestry and resource roads to expand the trail system.
- Develop a consistent branding and wayfinding system that includes iconic trails (e.g. walking trail around the Peninsula).
- Increase education and awareness regarding trail etiquette, rules, etc.

HRM has a wide variety of recreational trails and active transportation (AT) infrastructure. AT infrastructure, such as bike lanes and sidewalks, encourages any form of human–powered transportation as a mode of transportation to fulfill daily needs, while recreational trails focus mainly on providing recreational opportunities. Table 8 shows the type of trails within the HRM. The table includes the function, frequency, and management of trails in the HRM. While the trail types are extensive, the majority are undesignated and/or unmapped. Currently, the HRM trail system counts the following designated trails (Map 43):

- 117 km of Trans Canada Trails;
- 85 km of Primary Trails (Active Transportation); and
- 379 km of Secondary Trails (Active Transportation)

The trail network is organized into 20 distinct trail systems throughout the HRM, in either a completed and usable state, or in the planning or construction stages that are maintained by a community-based trail association. The following list includes the most fully developed trails in the urban area:

- Chain of Lakes Trail
- Point Pleasant Park Trails (wheelchair accessible)
- Frog Pond Trail
- Halifax Waterfront Boardwalk (wheelchair accessible)
- Mainland North Linear Parkway
- Halifax Urban Greenway (wheelchair accessible)
- McIntosh Run Community Trail (wheelchair accessible)
- Sir Sandford Fleming Park Trail
- Hemlock Ravine trails system
- First and Second Lake system
- Shubie Canal system
- Cole Harbour Heritage Park trails system

The following are the main trails in the suburban and rural areas:

- Bedford Sackville Greenway Connector
- First Lake Glen Slauenwhite Trail (wheelchair accessible)
- DeWolf Park Boardwalk (wheelchair accessible)
- Beechville Lakeside Timberlea Trail (wheelchair accessible)
- Portland Lakes Greenway (wheelchair accessible)
- Cole Harbour Salt Marsh Trail (wheelchair accessible)
- Cole Harbour Heritage Park (this is a system of trails)
- Dartmouth Harbourfront Walkway
- Musquodoboit Trailway
- Atlantic View Trail
- St. Margaret's Bay Rails to Trails

3.3.2.1 Active Transportation and Trails Planning

ACTIVE TRANSPORTATION

While there are many forms of active transportation, the focus of AT Planning in the HRM has been primarily to increase rates of walking and cycling (Halifax Regional Municipality 2014). Designated walking infrastructure, such as sidewalks, is important for walkers. Pedestrians and cyclists in urban areas have access to safe walking/cycling lanes along collector and arterial roads, as well as path networks and trails that are within and connecting to communities; AT infrastructure. However in rural areas where there is often no AT infrastructure at all, walking and cycling along the shoulder of roads is common and often unavoidable. The safer and more comfortable alternative is to use constructed trails. However, their availability is limited.

With the rise of cars and decline of the railways, a significant number of former railway corridors have fallen into disuse. Existing, abandoned right-of-ways have potential to serve as excellent active transportation corridors. Due to their former use, right-of-ways are typically at a very desirable grade, width, and location for cyclists, runners, and pedestrians. For several decades programs, like Rails-to-Trails, have begun converting these right-of-ways to local trails and expansive networks. Future studies should examine the potential for similar conversions within the HRM.

MAP 43. TRAILS

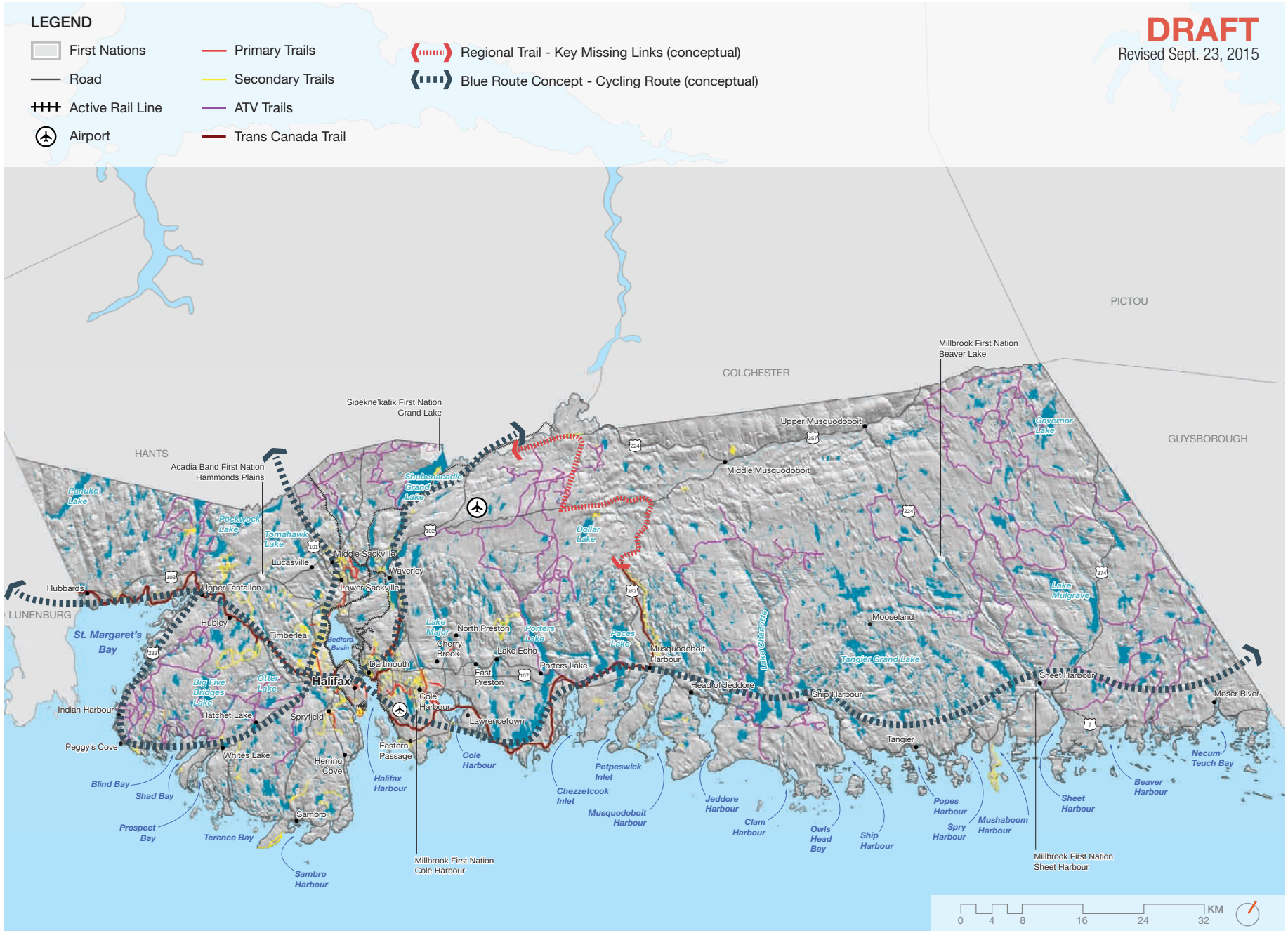


Table 8. Trail Types within the HRM

*Due to incomplete data for most of the trails summarized below in Table 8 are not all identified on Map 43.

TRAIL TYPE	COMMMENTS
Trans Canada Trail	[National] Note: there is currently no agreement between the TCT Foundation and the NSTF over the status of the trail between Halifax and Hubbards, as part of the TCT.
Blue Route	[Provincial-TIR/Bicycle NS] TIR is the lead provincial department on the Blue Route, but the majority of the advocacy work is undertaken by Bicycle NS. Largely conceptual to date, the first designated Blue Route section was declared in Pictou/Colchester counties on August 6, 2015.
Provincial Parks Trails	[Provincial-DNR] There are a number of provincial parks in the HRM (Oakfield, Taylor Head, Dollar Lake, and Laurie) that contain some walking paths built and maintained by DNR. On some provincial park lands, particularly McNabs Island and Long Lake, there is an extensive maze of unofficial, unmanaged pathways used by walkers, mountain bikers, and ATVs and dirt bikes.
Wilderness and Protected Area Trails	[Provincial-Environment] A number of the Wilderness Protected areas within HRM have extensive official walking trail systems. The Department of Environment manages the properties, while community trail associations develop and maintain the walking paths.
Nature Conservancy of Canada Trails	[NCC] There is at least one NCC property in HRM with a maintained footpath: Abrahams Lake.
Nova Scotia Nature Trust Trails	[NS Nature Trust] The Nature Trust's planned and recent acquisitions, particularly in the 'Hundred Islands' area make it likely that they will soon have some footpaths on their property. These may be unofficial, created by visitors, rather than managed trails.
Mountain Bike Routes (official)	[Bicycle NS] Bicycle NS maintains a list of official routes on their website: www.bicycle.ns.ca/mountain-biking-trails/. This is a relatively small number, and not reflective of mountain biking activity within the HRM.
Mountain Bike Routes (unofficial)	[Public input/Bicycle NS] The majority of MTB routes are unofficial, many on crown lands (i.e. Long Lake Provincial Park), but some are on private property near the edges of urban development near Halifax and Dartmouth (MacIntosh Run, Spider Lake).
Walking Paths (unofficial, Crown land)	[Public input] There are a number of unofficial trails in Musquodoboit Harbour and Sheet Harbour on former settlement roads and blocks of crown land that are near rivers and lakes. Often a form of traditional access, these trails are unmaintained by any trail association, these unofficial trails are locally known by residents, but unmapped and at risk of disappearing.
Walking Paths (unofficial, private property)	[Public input] There are a number of unofficial walking paths, particularly on coastal headlands on the Eastern shore, which cross private property to provide access the coast. As these are undocumented, and known only within the community, access is generally permitted by the land-owner.
Primary Trails (Active Transportation)	[HRM] The HRM has identified a number of routes (many on roadways, some on former rail-lines developed as trails) to be part of their Active Transportation network.

Table 8. Trail Types within the HRM (continued)

*Due to incomplete data for most of the trails summarized below in Table 8 are not all identified on Map 43.

Secondary Trails (Active Transportation)	[HRM] A secondary network of on and off-road routes has been identified and designed to facilitate Active Transportation.
Municipal Park Trails	[HRM] In addition to the AT Network, there are numerous trail networks in municipal parks: Point Pleasant, Shubie, Fleming, etc.
ATV Trails (official)	[ATVANS] Officially designated ATV routes identified as belonging to the ATVANS trail network are either on public or private property (with land-owner agreements).
ATV Trails (unofficial)	[Local clubs - HRM] There is also an extensive network of unofficial trails without land-owner agreements, particularly on crown property. It is unknown if these are fully documented by ATVANS.
Snowmobile Trails	[Provincial/SANS] SANS maintains a network of a few groomed snowmobile pathways throughout the province, maintained by local members clubs.
Multi-use Trails	[HRM] Redeveloped by the HRTAT, these are often abandoned rail-lines developed as trails that are constructed and generally maintained by volunteer trail associations.

AMENITIES

The one universal request of current trail users is for better information and directional signage of the location and access points for trails, especially at the trailhead, along the pathways, and on major highways. The lack of signage is seen as reducing the ability of visitors to locate and use important trail systems.

GOVERNANCE

There is concern that the visions for trail development of the Province and of the HRM will not match. Greater and ongoing consultation and coordination between HRTAT, NS Trails Federation, HRM staff, and the Province is recommended to ensure that municipal planning, design, and funding match provincial standards. The HRM and the Province benefit greatly from the volunteer labour of trail associations. However, there is still inadequate designated funding for new trail development, even in spite of the highly leveraged effectiveness of such funding. This management and governance situation may not be sustainable in the long run, as it also requires investment in materials and equipment, access to professional advice and plans, and the development of consistent standards for construction and maintenance.

MAINTENANCE

Though essential to ensuring a high quality experience, maintenance of all trails managed by volunteers is largely unfunded, and winter maintenance is almost non-existent.

REGULATIONS AND ENFORCEMENT

Regulations vary widely between the various regulatory authorities and land-owners. Under current Provincial hunting regulations, a large number of recreational pathways in rural areas are rendered off-limits during the hunting season, the bulk of the fall season. Additionally, there is limited enforcement of trail regulations on the trails by the police, RCMP, or provincial bylaw enforcement officers.

3.3.2.2 Opportunities

The HGNP offers the opportunities to look at the broad region and develop a comprehensive, recreational and AT trail system which can achieve local and regional connections. An ideal recreational and AT trail system would:

- Connect communities and destinations (e.g., parks, wilderness areas, community services, employment centres, schools, transit, popular tourism destinations, etc.).
- Create connections within and between communities.
- Connect to other modes of transportation (e.g., ferry, transit, carpooling parking lot, etc.).
- Offer a hierarchy of trail types and a range of trail experiences (e.g., on-road, off-road, on water, in nature, or in the city). Trails classified based upon levels of services/amenities available provide greater public clarity on what experience is presented at each facility.
- Link the major trail systems (e.g. Rail to Trail) to local trails and destinations (i.e. Cole Harbour – Lawrencetown Coastal Heritage Provincial Park).

Several additional regional trail opportunities include the following:

- Heavily-used informal trails are good candidate to be designated trails and ensure maintenance (i.e. the so-called 'Burger King' trails).
- A complete trail inventory, especially of informal trails, should be completed, and is essential to the development of a comprehensive trail system.
- The Blue Route Provincial Cycling Network vision, an interconnected cycling route across NS, along with a regional trail system, has the potential to attract visitors and position the region as a cycling destination, as well as expand other nature-based tourism opportunities. HRM should connect the developing province-wide network to four corridors linking Halifax to the South Shore, Valley, Truro, and the Eastern Shore.
- The regional trails plan should also be better integrated with the Trans Canada Trail.
- Other long distance (multi-day) trail opportunity is from Goodwood to St. Margaret's Bay.

Since 2006, the HRM has installed over 95km of bike lanes, with more added regularly during road improvement work. While this represents an improvement compared to 10 years ago, the network still has many gaps and is fragmented. The highest proportion of commuter biking is in the Regional Centre where the network is most extensive. Going forward, the HRM will continue to build bike lanes wherever possible. In rural areas where paths and trail networks are very limited, the HRM will work to increase the provision of paved shoulders along roads. This supports the work of Bicycle Nova Scotia and the Province, including the 'Blue Route,' a continuous cycling route that provides AT connections to local destinations.

TRAILS

The HRM actively supports trail construction. It builds its own trails within the urban core and has supported the work of the Halifax Regional Trails Association (HRTA), a volunteer-based organization that supports community trail groups to develop, build, and promote a system of interconnecting trails throughout the HRM. Continued improvements and upgrades to the municipal trails network depends heavily on the dedication and energy of volunteers.

3.3.2.2 Issues

A coarse-grain analysis of the existing trail network, supplemented by public and stakeholder input, identified major issues which are related to connectivity, access, user conflicts, trail types, amenities, governance, maintenance, regulations and enforcement.

CONNECTIVITY

Both on and off-road, there are key connections that are missing, and impede connectivity and the wide-spread use of Active Transportation (AT). This is particularly true of the Trans Canada Trail, the Blue Route, and in urban areas. Some of the issues that limit connectivity of AT for commuting and recreation purposes, include:

- Inadequate and disconnected urban cycling infrastructure;
- Fragmentation by new development and provincial highway system;
- Too few long-distance pathways; and
- Disconnection to ferry terminals (Halifax and Dartmouth).

With few exceptions, there is no integration between the various trail types and usage groups. The Bluff Trail beginning from the Beechville Lakeside Timberlea Trail is an example of good integration, while a key missing link in the regional trail network is highlighted on Map 43.

ACCESS

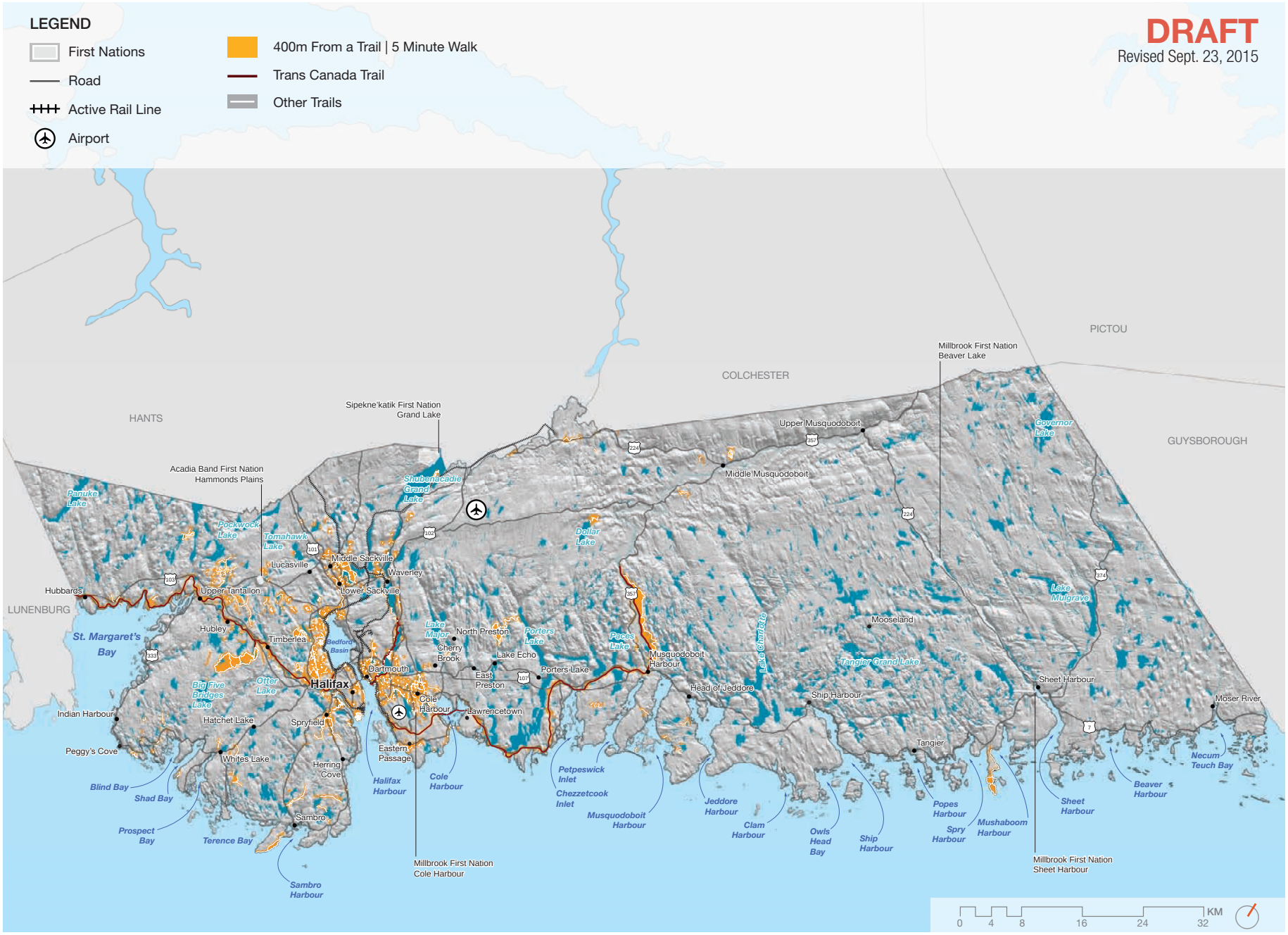
As shown in Map 44, few areas are within 400 metres (5 minute walk) of a trail. Correlated to the trail access analysis, few areas of the HRM have a medium to high trail density, shown in Map 45.

USER CONFLICTS AND TRAIL TYPES

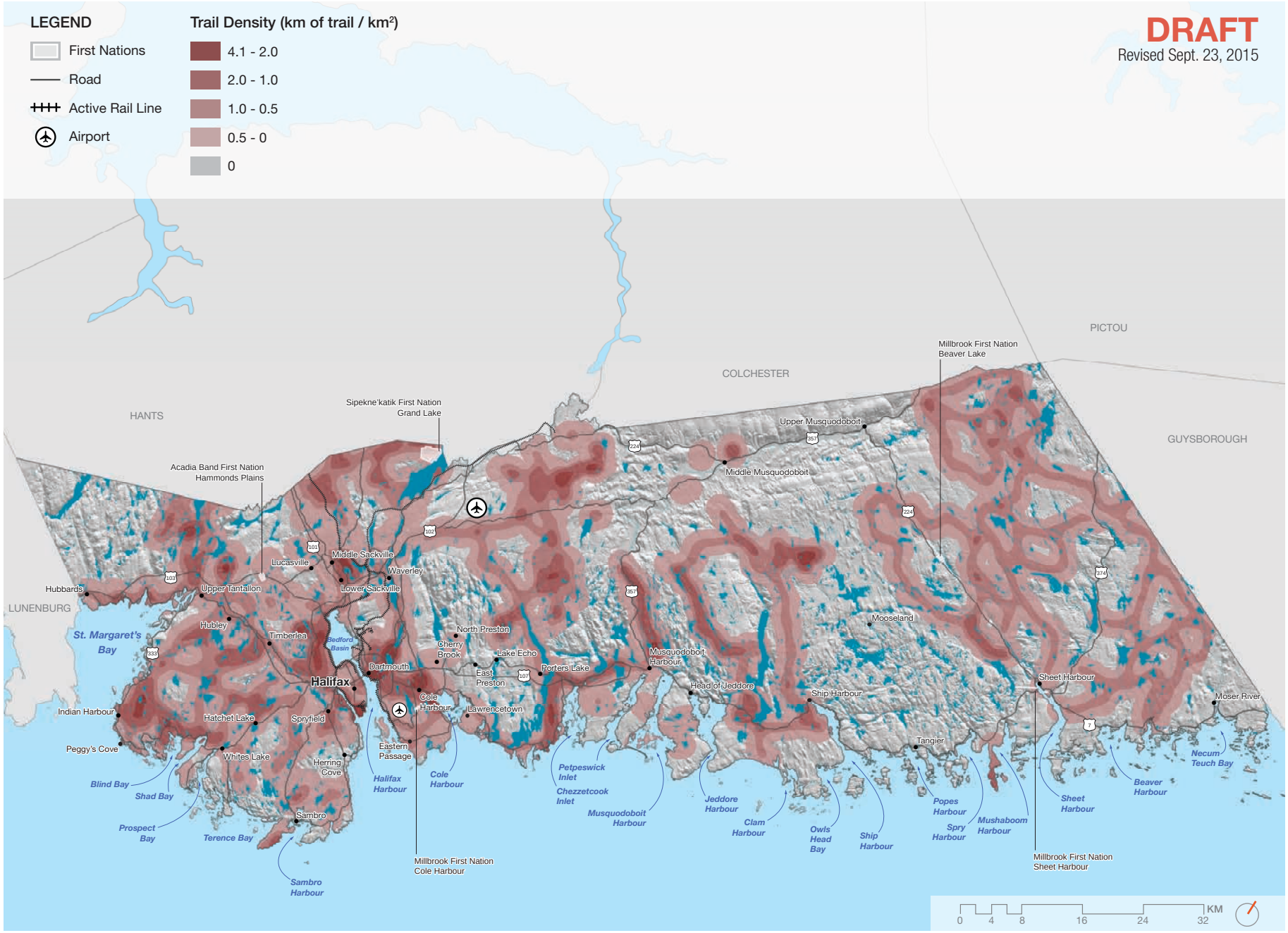
All-terrain vehicles (ATVs) are known to create numerous conflicts for surrounding development, recreation, and habitat. The use of ATVs for transportation on trails is generally accepted in rural areas. However, occasionally the use of ATVs on trails creates conflict (e.g. Rail to Trail (Shearwater Flyer Trail and BLT) and the Terence Bay Wilderness Area (TBWA)), resulting in a desire by some residents to limit ATV access to specific areas or limit the intensity of use. There is a need to balance the use of ATVs with ecological interests and improve the enforcement of ATV rules (which often proves challenging).

Additionally, several mountain bike specific issues and opportunities include: permitting mountain bikes on designated trails in wilderness areas; creation of specific single-use mountain bike trails; and identify areas for the protection, formalization, and sustainable development of MTB trails. Finally, although motorized/non-motorized conflicts receive the most attention, conflicts between cyclists and pedestrians, and dog owners and non-dog owners also heavily contribute to tensions on the trails.

MAP 44. ACCESS TO TRAILS



MAP 45. TRAIL DENSITY



- An iconic long distance trail opportunity is to create a walking trail around the Halifax peninsula, including waterfront trails/boardwalks in urban areas.
- Develop a consistent branding and wayfinding signage that includes iconic trails.
- Increase education and awareness regarding trail etiquette, rules, etc.
- Promote 'Share the Road', education (need a bell, how to use a bell) two education weeks (spring/fall).

Utilities and transportation opportunities include:

- Utilities and transportation corridor offer great opportunities to achieve regional connectivity. ROWs; infrastructure and transportation corridors as well as forestry and resource roads to expand the trail system.
- Examine potential for new AT routes including the formalization of existing informal trail, reuse of resource roads, rails with trails (Bedford to Halifax), Long Lake Provincial Park, etc.
- Combine linear infrastructure corridor with active transportation (e.g. trail build over infrastructure lines, etc.).

Integration of trails with new communities and development opportunities include:

- New housing developments and neighbourhoods should have their own network of recreational pathways and connections to the Active Transportation network.
- Within suburban and rural areas, growing communities need to be as compact as possible, and offer a range of live, work, shop, and play opportunities within walking and biking distance of each other. In new developments, developers could also be required to contribute to sidewalk construction.

3.3.3 Water Recreation and Public Access

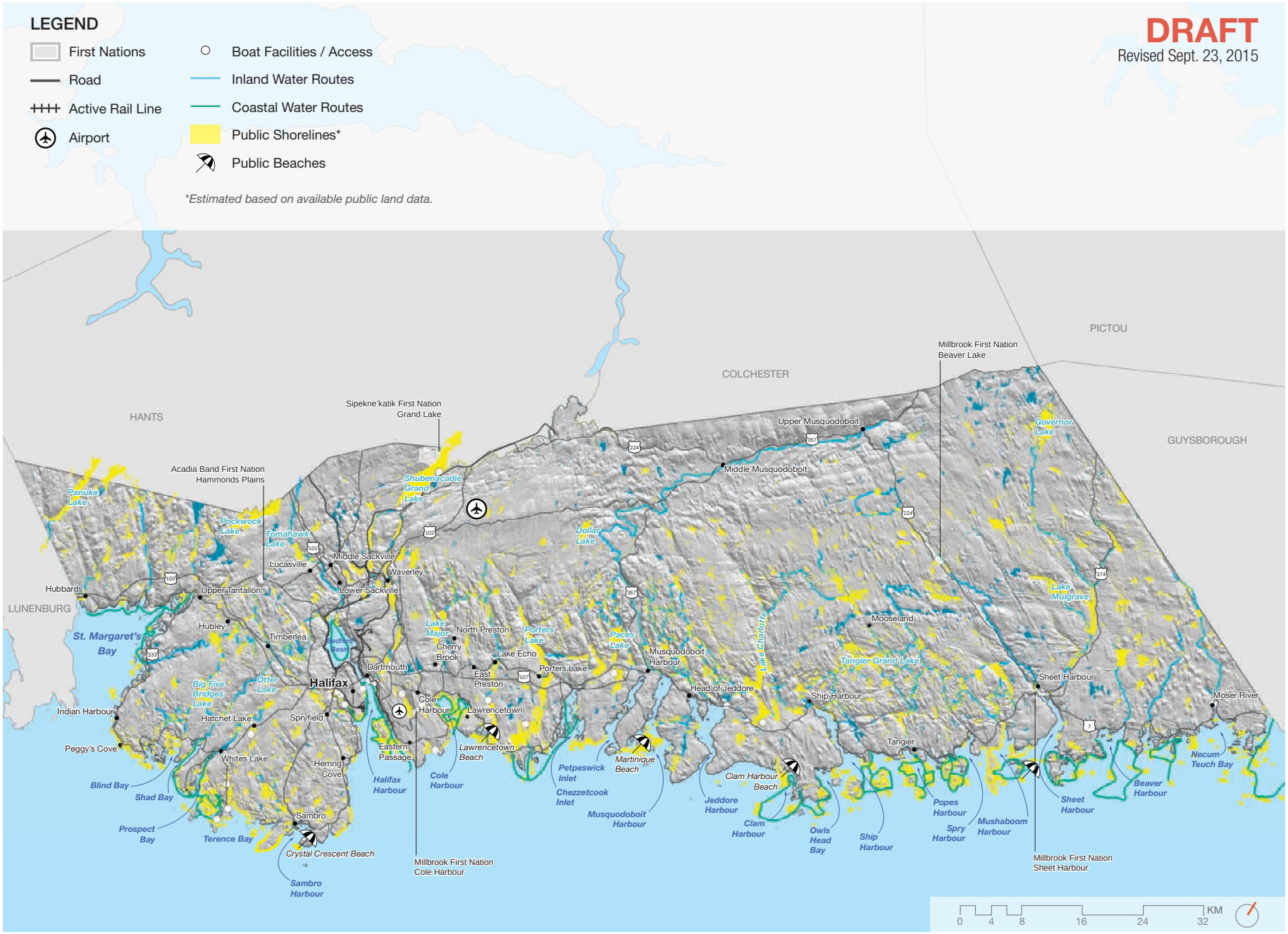
KEY ISSUES

- There is limited water access (coastal and inland) in many parts of the HRM – 85% of Nova Scotia's coast is in private ownership (100 Wild Islands Legacy Campaign).
- Public access along the coast is interrupted by development along water bodies and shorelines, creating missing links and dead ends.
- There is a need for additional amenities to improve water access in certain areas, and better facilitate use.
- There is concern by the public that the HRM is losing control of water frontage around Bedford Basin.
- Although every navigable waterway is used by recreational canoeists, few designated launching sites exist.
- Coastal housing developments, particularly near the urban core, are eliminating long-used kayak and SCUBA access points.

KEY OPPORTUNITIES

- Improve access to existing water routes, including creating additional access points, and more facilities for water route users and commuters.
- Improve amenities to support water recreation activities (e.g. parking, portage trails, canoe racks, etc.).
- Develop canoe/kayak launches on HRM lands adjacent to parks and protected areas.
- Provide viable portage routes along the Shubenacadie Canal and other canoe routes.
- The 100 Wild Islands Legacy Campaign (stretching from Clam Harbour Beach to Taylor Head Provincial Park), a partnership of conservation and eco-tourism along the eastern shore.
- Development of coastal marine park(s).
- Mapping and signage to inform the public of official access points.
- Place high priority on public water access, as a public resource for new subdivisions and developments.

Map 46. Water Recreation and Access



Water recreation and shoreline public access are fundamental to the culture, recreational enjoyment, economy, and infrastructure of the HRM and are highly valued by residents. There are many problems with the appropriation of public right-of-ways and/or beaches below the high tide mark, for private use by shoreline property owners, creating access challenges for swimming and boating in particular. Many access points appear private, but are actually public. Enhanced mapping and signage are needed to inform the public of official access points to water bodies and coastal areas, as well as to confirm the public's right to the use of beaches. Through public engagement responses, several key issues and opportunities were identified, including the following:

- Improve access to existing water routes, including creating additional access points.
- Improve facilities for water users both recreational and commuting: washrooms, picnic areas, wharves, canoe racks and locks, and island camping sites.
- Waterway commuting is a rare opportunity and should be better capitalized on through waterfront parks and investment in water routes in Great Harbour. For example, a commuting route from Jollimore to Halifax waterfront.
- Improve infrastructure for access by all types of transportation. For example, many boats do not fit under highway bridges.
- Missing links in the water route system include the Eastern Passage to McNab's Island to Herring Cove or Purcell's cove up through the wildlands to the Rails to Trails system and the Five Bridges Wilderness Area.

The Province has detailed many of the paddling routes in the area, providing a summary and description of the most frequented water trails (Map 46). Map 46 also shows the locations of publicly accessible beaches, shoreline, and lakes. These areas have been identified as 'public,' as they intersect in some way with public lands (HRM lands, Provincial Parks, Wilderness Areas). 'Public' does not mean that infrastructure is in place to provide or facilitate access. Highlights of this analysis include the followingMost harbours are under private ownership. The publicly accessible shoreline is becoming more fragmented as a result of increasing shoreline development and privatization of coastal areas.

- Missing links exist between coastal and inland water routes in some places, especially in the Bay of Islands area and the Eastern Passage to Three Bridges Wilderness Area.
- The locations of access points and boat launches on public lands are not well known.
- Ownership of coastal islands is not well-known, resulting in wide-spread trespass by recreational sailors and kayakers.

3.3.3.1 Coastal Opportunities

The Province has identified several key sea kayak routes and areas, including:

- Porters Lake to Chezzetcook
- Little Harbour
- Murphy Cove
- Tangier Harbour
- Popes Harbour
- Sober Island
- Bay of Islands (Port Dufferin)
- Bay of Islands (East Quoddy)
- Ecum Secum

However, access to coastal areas is limited in some places, including Pleasant Point tidal rapid, the Halifax North End, Bedford Basin, the North West Arm, the area between, The Dingle and Ketch Harbour, Hubbards, and St. Margaret's Bay along Route 333. Generally the characteristics of the ocean shoreline will influence suitability for water access which should be examined as part of the Phase II assessment and later recommendations. The same may apply to inland waterways. Water access will be a major issue of importance for Council and is obviously showing up in Phase I findings.

3.3.3.2 Inland Opportunities

Some of the best known inland paddling routes (of which Canoe Kayak Nova Scotia and the Nova Scotia Geomatics Centre have collaborated to produce detailed inland route maps) include: Aspotagan Peninsula, Eastern Shore Lake System, and Musquodoboit River. The most commonly used inland canoe routes by novice recreationalists are: the Shubenacadie Canal and lakes system, and the upper Musquodoboit River. Additionally, the Birch Cove Lakes Canoe Trail is a key route for the region. Generations of Halifax residents have used the pristine lakes of the HRM for active recreation, including an 8-lake canoe route with portages. Now partially preserved as the Blue Mountain Birch Cove Lakes Wilderness Area, new access points with more trails will be built once the Regional Park is established. However, there is limited inland water access in many parts of the HRM, including Timberlea, Fraser's Lake, Pace's Lake, Birch Cove Lake, Susie's Lake and the Blue Mountain Birch Cove area, Wright's Lake, Porter's Lake canal, and lakes in the Dartmouth area.

3.4 COMMUNITIES

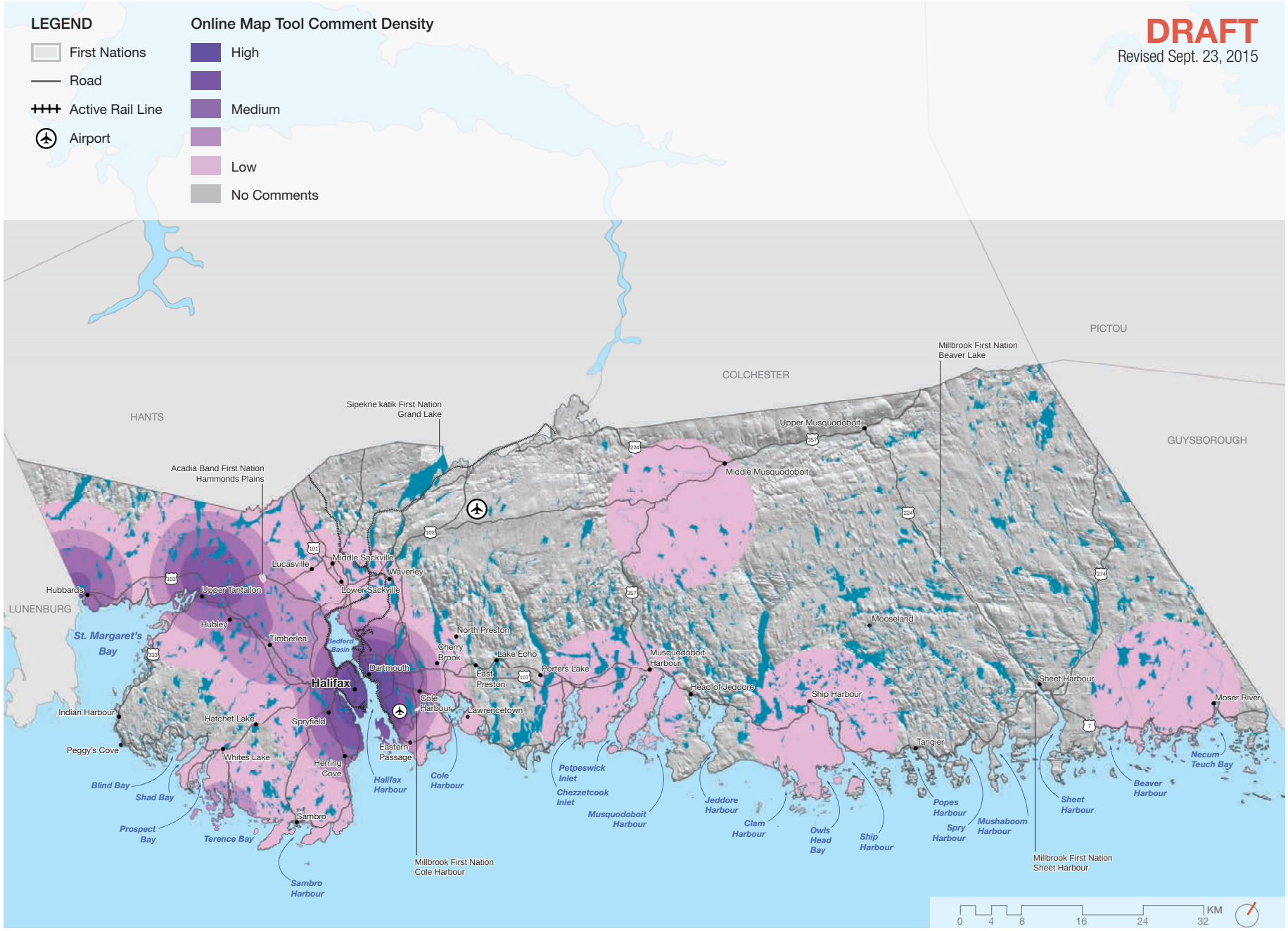
Value Statement: Parks and open spaces contribute to the unique sense of place as well as helping shape community identity and community form. Strategic open space protection helps to ensure that growth management objectives are achieved through sustainable development patterns. Accessible urban open spaces are connected by foot, bicycle, and transit, and promote an active lifestyle as well as contribute to the overall quality of life.

3.4.1 Settlements

KEY ISSUES

- Convenient access to rural and natural landscapes, as well as pedestrian connections within suburban developments, is of significant importance to the residents of the HRM.
- The ability to 'escape' the city is a critical community value and the natural landscapes of the HRM are an important component of community identity.
- The quality, configuration, and amount of park space are can be challenges for new and future communities.
- Based on past planning policy, the allocation of park land in some existing subdivisions has resulted in parks that are small, often remnant lands, with limited programming opportunities and community value.
- There is a need to consider new park space within the framework of a detailed park system plan.
- Such a plan will provide direction for HRM to relocate, defer, and acquire open space at strategic locations that offer the most opportunity and community benefit.

Map 47. Density of Online Public Comments – Communities



- There are significant issues with leapfrog development and sprawl, both of which often occur as regions grow, if development and growth is not appropriately allocated and regulated.

KEY OPPORTUNITIES

- Future park acquisition criteria should assess:
  - Current level of service;
  - Clustering of amenities and linkages to community assets;
  - Economic value of the potential open space (attract tourists, residents, and business investments);
  - Public health benefits; and
  - Ecological function.
- The open space network should not only define settlement edges, it should provide a choice of active mobility through the region and convenient access to recreation opportunities.

GENERAL DISCUSSION

The HRM features a wide variety of urban and suburban communities, developed over a broad length of time. The Halifax peninsula is comprised of a dense urban centre, surrounded by increasingly disperse development that spreads along major transportation routes. Other long-standing communities are found through the coastal region, and spreading to the north and east of the urban centre. These communities rely on a variety of economic and social factors, and feature a broad range of infrastructure development. Online public consultation has provided a useful overview of the areas which have been publicly identified as important, valued, or at risk (Map 47).

3.4.1.1 Urban Communities

As the HRM intensifies there is increasing pressure for higher density development in desirable locations. Desirable locations for development are often near important regional parks such the Halifax Common. However, without proper design guidelines there is significant risk that new development will shadow, and negatively impact open spaces. Open spaces can help mitigate these negative impacts, by reducing the sense of 'crowding' and 'claustrophobia' of urbanized areas. Additionally, as areas 'densify', the amount, quality, and programming of open spaces needs to be adjusted to account for the increase in population and diversity.

Moving forward, the following considerations for parks and open spaces in urban and rural communities should be instrumental to the development of the HGNP and be considered in further detail. They are listed, but not limited to the following:

- There is a perception that north Halifax is underserviced by open space. Further analysis should be undertaken to verify disparities and a strategy should be developed to address these disparities, if required.
- Transit routing should continue to provide a regular level of service to the green network, but opportunities to add stops along routes to parks and open space should also be pursued. Additionally, measures that could improve the overall performance and therefore the transportation service for the entire population of the HRM, particularly along a few key transportation corridors and to highly visited destinations should be pursued.
- Significant viewsheds must be maintained and areas with public access to the water must be maintained and enhanced, where possible.
- The tree canopy and urban and rural forests have important ecological, quality of life, and heat island functions. Their maintenance, enhancement, and stewardship should remain a priority for the HRM.
- Clearing vegetation from large areas of land prior to development should be discouraged; private tree conservation should be a priority across the region.
- Within urban centres, there is an opportunity to provide more naturalized parks, including natural playgrounds, which can provide both ecological and social benefits.
- Greening programs in commercial and industrial parks should be enhanced to provide shade, visual breaks, and improved stormwater management.

3.4.1.2 Suburban Communities

As constructed today, new suburban parks do not contribute to a community's sense of place. New parks in subdivisions are often not sited appropriately, are frequently without easy access from the urban areas, and often seen as little more than undevelopable remnant areas, without a strong connection to the residential community.

Park and open spaces within new subdivisions should be sited, configured, and designed to contribute to a HRM-wide parks system. In doing so, open space design should help improve permeability and connectivity for active transportation through and to new communities. New communities should be designed around significant natural features, which should form part of the 'ecological infrastructure' of the community. For example, there is significant potential to link multiple conservation subdivisions to provide broader benefits, and improve overall connectivity between the developed areas and the broader natural landscape.

3.4.1.3 Rural and Coastal Communities

Urban forms of development can be a threat to community sustainability, and to the very character of the landscape in which that development occurs. While large stretches of the HRM remain undisturbed natural areas, those surrounding existing urban development are under significant pressure, as the ecological functioning of the natural landscape is compromised by conventional development patterns. As expanding development occurs, the undisturbed natural landscape is eroded, breaking down the distinct boundaries between existing communities. Coastal fishing villages, traditionally compact, unique, and distinct communities, are especially at risk of sprawl. Unabated, the character of the coastal village will be lost to sprawl as one community bleeds into another.

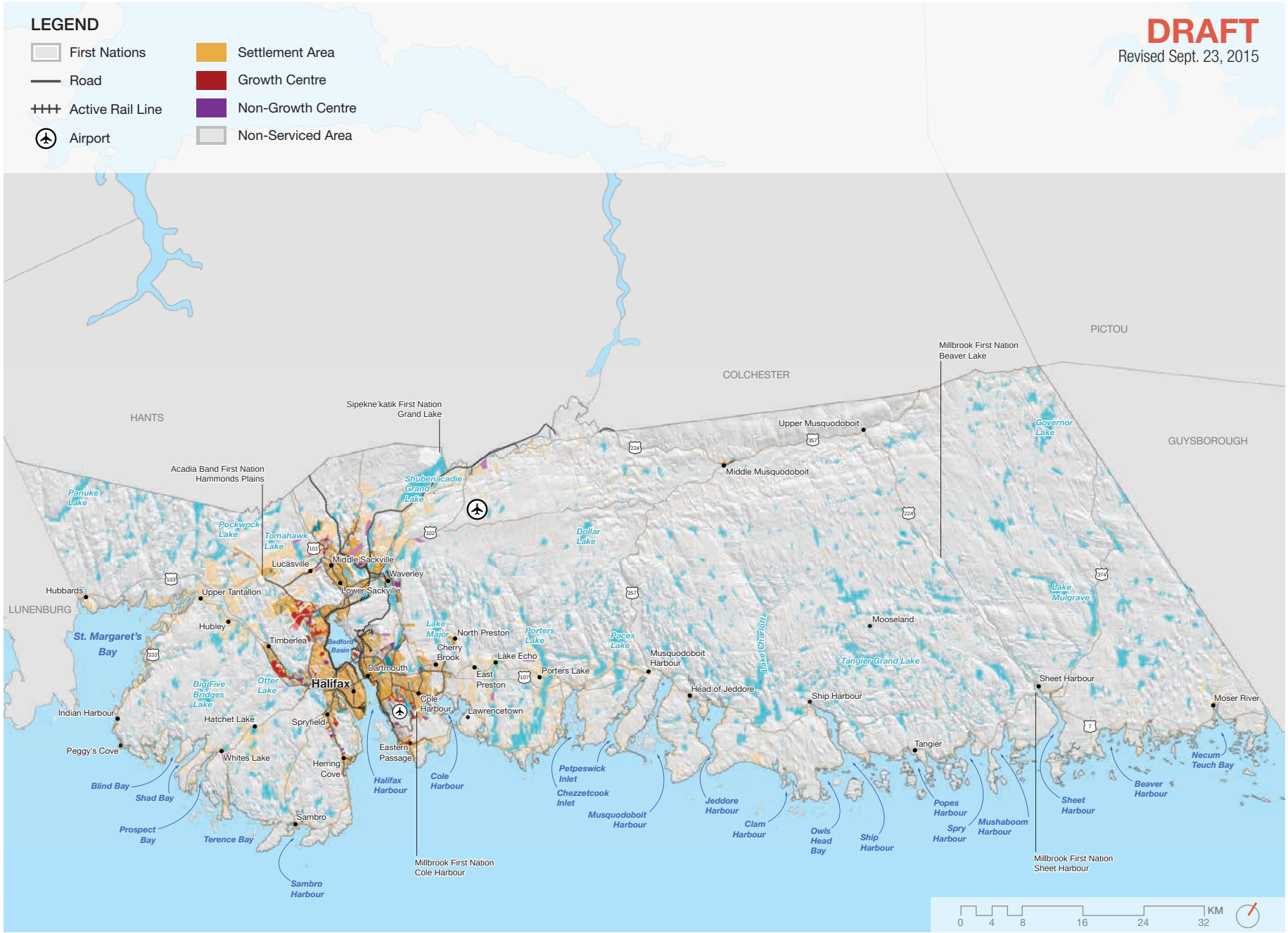
3.4.2 Regional Growth

According to the 2013 Growth Scenarios Report, it is estimated that 25% of HRM's anticipated growth will occur in rural areas of the HRM, with 50% occurring in suburban areas. Growth in suburban and rural communities can be especially susceptible to leapfrog development, resulting in sprawl, inefficient infrastructure investments, traffic and congestion, and a series of negative environmental, social, and economic impacts. Furthermore, such development could have a significant impact on the green network (largely through fragmentation and impacts on ecosystems), if development is not sited and designed appropriately. The Regional Plan identifies Urban Settlement and Rural Commuter centres for growth (refer to Map 48), as well as their respective characteristics. In addition to the Regional Centre, these other growth centres include the following:

- **Urban Settlement Growth Centres:** West End Mall, Mic Mac Mall, Shannon Park, City of Lakes, Penhorn-Woodlawn, Woodside, Spryfield, Bedford West, Sunnyside Mall, Sackville, Russell Lake, Port Wallace, Sandy Lake, Highway 102 West Corridor, Bedford South, Herring Cove, Lakeside/Beechville, Timberlea Village, Clayton Park West, Birch Cove, Kearney Lake, Bedford Mill Cove, Lower Sackville, Main Street, Middle Sackville, Morris Lake North, Westphal, Cole Harbour, and Eastern Passage.
- **Rural Commuter Growth Centres:** Porters Lake, Upper Tantallon, River-Lakes/Fall River, Musquodoboit Harbour, Tantallon Crossroads, Enfield, Lake Echo, and Hubbards

Moving forward, further study of development pressure areas (including land designated as urban reserve and lands currently under development agreement) and areas at risk for fragmentation will be important to conserving parks and open space, as well as managing future growth and development.

Map 48. Development and Settlements



3.4.3 Industrial Lands

KEY ISSUES

- The erosion of industrial lands for other development purposes, including industrial parks and waterfront lands.
- Ensuring an adequate, long-term supply of well-located and serviced land for industrial use and development.
- Critical industrial land-uses such as airports, industrial parks, and port facilities are challenged by land-use conflicts and public expectations around environmental sustainability, particularly near urban areas and conservation lands, and ecological priorities.

KEY OPPORTUNITIES

- Greener infrastructure and sustainability practice associated with the use of greenfield sites for industrial use.
- Incorporate stronger ecological assessment as part of industry location, siting, and development to ensure that valued natural areas, elements, and ecological systems are protected, and reduce the environmental and community impacts.

Industrial working landscapes are critical to HRM's economic viability and its development as a prosperous city and region. Industrial activities that require large land areas, such as airports, industrial parks, port facilities, and construction lay-down yards support the HRM's GDP and employment base. As many of these activities consume large tracts of land and may have a requirement for large open spaces (such as airports), there are often conflicts with other land-uses and some ecological objectives. For example, the need for bird-free zones around airports or the consumption of large tracts of land for heavy industrial operations can create competing public and environmental expectations.

Additionally, many of these lands have access restrictions for safety measures, such that they can significantly fragment the landscape for both the public and wildlife. Mitigating such concerns has been an on-going challenge for governments, business operators, and communities, and requires new solutions and collaborations to ensure that these kinds of industries can continue to operate and develop. Finally, industrial lands, such as industrial parks can shape communities, commute patterns, and the overall quality of life and aesthetic of the region, therefore careful land-use planning will need to be implemented to appropriate site, allocate, and ensure high quality development standards. To this extent, in addition to the Regional Plan, the 2008 Business Parks Functional Plan and A Greater Halifax Economic Strategy 2011-2016 should be considered in the development of the HGNP to accurately align with the HRM's industrial growth and development goals.

3.4.4 Urban Open Spaces

KEY ISSUES

- Many areas are underserved in term of access to parks within walking distance (400 m).
- The development of parks in new subdivisions often focuses on small parks that are poorly connected to the larger open space system rather than the creation of larger parks that provide greater benefits than the sum of the small parks.
- The design of new subdivisions often does not contribute to park connectivity and walkability.
- More effort is needed to preserve significant open spaces in the development of new subdivisions and to consider the broader regional connectivity and optimal configuration.
- Future growth in already developed areas will put additional pressure on existing parks and increase the need for more parks in those areas.

KEY OPPORTUNITIES

- Identify the optimal open space network prior to development area design. The landscape should provide the organizing structure of new communities.
- Preserve large, well connected open spaces in new neighbourhoods.
- Consider aggregating the open space requirements of individual developments to create larger parks with connecting corridors to new communities.

- Expand the use of conservation design subdivisions to allow for density neutral development that protects ecologically important elements and larger more connected open spaces.
- Ensure both large and small parks are provided within walking distances of residences.
- Many parks and open spaces can play a role in green infrastructure providing multiple benefits including community central gathering spaces, recreation, biodiversity, stormwater management, and food production.

GENERAL DISCUSSION

This section focuses on parks within or in close proximity to communities. Other parks and protected areas are discussed in Section 3.3.1. Urban open spaces encompass urban parks, plazas, green streets, and community gardens. These spaces provide multiple environmental, social, and economic benefits in urban areas. In addition to contributing to healthy ecosystems and lifestyles and citizen enjoyment, they play a central role in defining the community identity and the attachment of residents to their community. These urban open spaces present opportunities to socialize, play, exercise, or simply enjoy the outdoors close to home.

3.4.4.1 Urban Parks

Urban parks vary, from small district pocket parks to larger and more natural regional parks. Currently, urban parks are divided into four classes based on the role they play in the parks systems: District Parks, Community Parks, Neighbourhood Parks, and Regional Parks.

Table 9 presents these park classifications, their description and catchment area. The current park classifications are directed at providing a diversity of parks, but provide minimal information on ideal size range, configuration, or the number of people they are meant to serve.

Given the desire to focus the majority of development growth in the Regional Centre and urban communities, there is likely to be additional pressure both on existing parks, as well as for more parks to serve the needs of a growing population. The Regional Plan called for an increase in the park dedication rate in new subdivisions to 10% of the area of land being subdivided (with some exceptions), however this may not be adequate to provide the full range of necessary ecological and cultural services that parks can provide. Dedications within a single subdivision may need to be considered in a broader development context where multiple subdivisions jointly distribute and provide a range of parks by pooling their park dedication requirements. This may require local area landscape plans to coordinate the efforts of multiple developers.

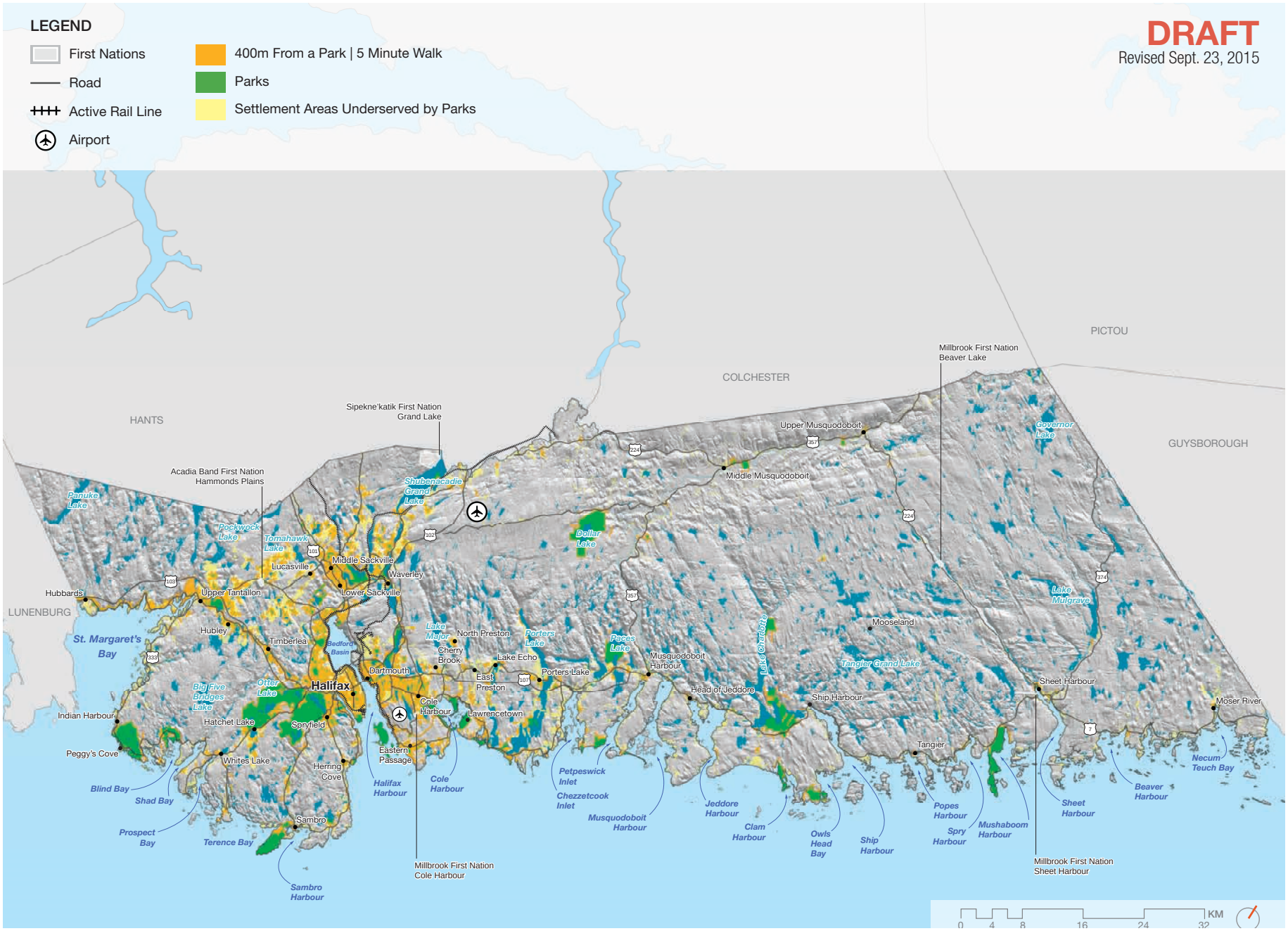
3.4.4.2 Access to Parks in Settlement Areas

Map 49 presents areas that have access to any type of parks within a 5-min walk (400 m). Areas in light yellow represent areas that are beyond 400 m and may be considered as underserved. This analysis is most relevant for urban and suburban areas. Analysis shows that some areas of older development, such as portions of the Halifax Peninsula and Dartmouth areas do not have easy walking access to parks, while large areas, such as Cole Harbour, Middle Sackville, Lucasville, and Tantallon have few parks within walking distance. Additionally, though many newer subdivisions in outer areas may have larger private lots, the overall provision of public open space is low. In contrast, many smaller coastal communities appear to be underserved but have usually have access to other significant regional open space and ocean. Finally, industrial areas have little access to parks, which could contribute to greater worker health and productivity. These industrial, as well as commercial areas, are also not well connected by linear park corridors, which could provide commuters with alternative, active transportation links.

Table 9. Urban Parks Classification System (Halifax Regional Municipality 2014)

Class	Description	Catchment area
District Parks	District parks provide amenities and facilities for passive and active recreational activities. They may include areas that are left in a predominantly natural state.	Several communities in the range of 10,000 persons
Community Parks	Community parks provide amenities and facilities for organized youth and recreational adult level sports, and may also include facilities for play by children.	Three or four neighbourhoods with a population in the range of 1,200 persons
Neighbourhood Parks	Neighbourhood parks provide amenities for passive activities and facilities for play by children.	Centrally located for neighbourhood of 80-120 households
Regional Parks	Regional parks preserve and protect significant natural or cultural resources. They may be federal, provincial, or municipal properties and are intended to serve the educational, cultural, and recreation needs of the population of the entire region as well as for visitors to HRM.	N/A

MAP 49. ACCESS TO PARKS IN SETTLEMENT AREAS



3.4.4.3 Green Streets

KEY ISSUES

- Streets are the most underutilized open space in urban areas. Though many older streets have separated sidewalks and street trees, road infrastructure within the HRM is generally not designed with the pedestrians and cyclists in mind. These single purpose streets, designed for vehicles, have not considered the integration of multiple uses, including: vehicles, bicycles, pedestrians, storm water management, urban forest canopy, and public use (as a gathering, social space).
- The width of new suburban streets encourages efficient vehicle movement, snow clearing, and on-street parking but created hazards in terms of vehicle speed and pedestrian crossing.
- Lack of definition, criteria, and requirements for 'green street' design and location.
- Lack of connectivity and access to park and open space in new neighbourhoods and older areas where new parks are problematic to develop.
- Canopy loss on older streets.

KEY OPPORTUNITIES

- Given increasing demand for open space, particularly in urban areas undergoing densification, the greening of streets for multiple purposes could significantly contribute to the creation of more useful and effective open space.
- Green street policies are needed that encourage green infrastructure, low impact design, and complete street initiatives, as a way of providing an ecological function, as well as a social, recreation and mobility functions in communities.
- Maintain and enhance the existing tree canopy and introduce green streets as a means of enhancing community identity and image.
- Green streets have the potential to serve as links that connect communities, parks, and open spaces.

GENERAL DISCUSSION

The concept of "green streets" is defined as an approach to street planning and design that gives priority to pedestrian and cyclist circulation and open space over other transportation uses, through a variety of design and operational treatments. These treatments include plantings and landscaping, sidewalk widening, traffic calming, and other pedestrian and cyclist-oriented features. Green streets build upon existing initiatives, such as "complete streets," where streets are designed to permit equally safe and convenient access for all ages, abilities, and modes of travel (Halifax Regional Municipality 2014), while further enhancing roadways with the addition of cycling, pedestrian, and multi-use trail facilities. In the HRM, green streets have the potential to enable the establishment of a complete, integrated, safe and accessible region-wide open space network. While a formal definition for green streets has not yet been adopted by the HRM, there is a significant opportunity to integrate green streets policy into the HGNP for implementation through Secondary Plans and support improved community design standards, within public right-of-ways, to create more attractive and complete communities.

Green streets also serve to improve the overall environmental sustainability of communities by creating a means to introduce low impact "green" development within the public realm. For example, the Urban Forest Master Plan (2013) estimates that 709,000 publicly-owned trees line the urban streets of the HRM. Of these, 157,000 were directly planted and managed, while the other 552,000 were naturally regenerated trees along HRM roadways. Despite this abundance, it is estimated that there are 94,000 vacant and plantable spots for trees on HRM-controlled right-of-ways. A concerted effort should be made to plant these areas as part of a green streets initiative to provide for an ecological function in addition to a social, recreation and mobility function throughout communities.

3.4.4.4 Community Gardens and Urban Agriculture

KEY ISSUES

- Overall demand for local food is increasing.
- While the number of community gardens has increased in recent years, space for community gardens is limited and good data related to the total area and number of community gardens is incomplete.
- Climate change and increase risk of weather events and rising fuel/ production/water costs can put the HRM's food system at risk, as the importation of food becomes more expensive and more subjective to global events; food security is a growing concern for the HRM.

KEY OPPORTUNITIES

- Increase contributions of urban space to local food systems (e.g. community gardens, farmer's markets, food hubs, etc.) as demand increases while ensuring that the use of existing parks for such purposes does not displace other uses.
- Provide community garden spaces in each district, particularly in areas of high density to address a higher community demand and greater intensity of use.

GENERAL DISCUSSION

The HRM supports the cultivation of land for local food production through community food infrastructure such as community gardens and urban agriculture infrastructure such as urban farms and rooftop gardens. The 2014 Food Counts: Halifax Food Assessment indicates that the demand for local food is increasing, as evidenced by the increase in community food infrastructure such as community gardens, farmers' markets, buy-local media, and the inclusion of buy-local guidelines in institutional policies, as well as the availability of municipal lands for such initiatives. However, the HRM could improve on opportunities and land available for other food related infrastructure, such as food retail space and livestock (chickens, goats, etc.) at a smaller scale for individuals or communities. Community garden and urban agriculture infrastructure is economically, environmentally, and socially beneficial to the HRM and serves to support a range of open space types within the green network.

Community garden models in Halifax include teaching gardens, urban farms, allotment gardens, collective gardens, community organization run, and/or university/college gardens. Three urban farms (including teaching and community gardens) cover ~9.5 acres and the remaining 41 gardens (inclusive of allotment, collective and community gardens) make up another 3 acres (does not include 42 school garden and other gardens for which data were not available) (Halifax Food Policy Alliance Food Assessment Working Group 2014).

In addition to existing local agriculture in the HRM, there is substantial potential to further support local food industries on a variety of scales. A study that examined the potential space for food production within the urban area of peninsular Halifax identified that 1/6th (3.2 km^2) of the Halifax peninsula has potential for crop cultivation and could produce a significant amount of summer-season vegetables (Nipen 2009) (Halifax Food Policy Alliance Food Assessment Working Group 2014). Furthermore, this study did not include public areas, such as parks, fields, and idle or underused lands, which indicates even greater opportunity for ensuring food security with a local food supply to accommodate a changing climate and fluctuations of food prices.

Community gardens are supported through municipal policies, the Halifax Community Grants Program, Respecting the Community Garden Program, and the Tax Exemption for Non-Profit Organizations Program. Additionally, the Urban Forest Master Plan (2013) also enabled the development of urban orchards on city land, which contributes to the regions urban forest canopy. There is an opportunity to further support community garden, urban agriculture initiatives, and infrastructure through the HGNP to emphasize the importance of local agriculture in the region.

3.4.5 Urban Forest

KEY ISSUES

- Urban trees are disappearing faster than they are being replaced.
- Many mature urban trees are reaching the end of their life cycle.
- The development of waterfront properties is decreasing riparian forests.
- Substantial tree removal is occurring in areas of suburban development.
- Nova Scotia Power Inc. (NSPI) has raised concerns regarding tree-management in right-of-way areas, where powerline infrastructure management occurs in conflict to the scenic character of local neighbourhoods.

KEY OPPORTUNITIES

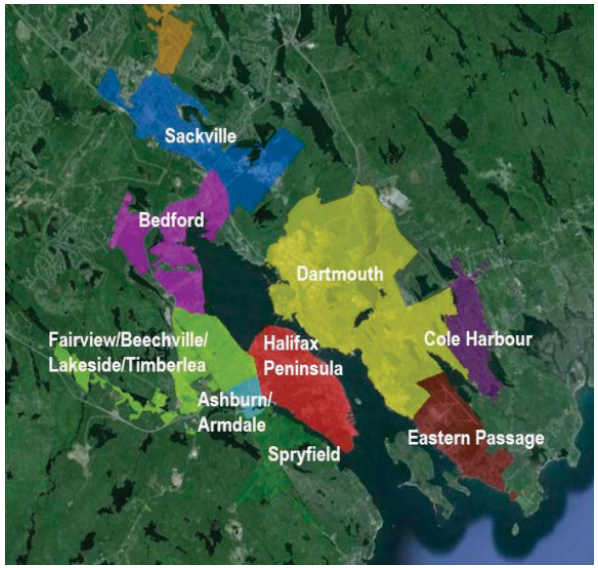
- Identify, conserve and manage large and mid-sized patches of forest within urbanized areas.
- Enhance the conservation of forested riparian buffers to protect aquatic systems.
- Designate key green corridors, boulevards and streets within urban areas and ensure a healthy forest canopy.
- Plant supplemental trees to replace mature trees and ensure healthy species and age class diversity.
- Place priority on implementation of the Urban Forest Management Plan.

GENERAL DISCUSSION

Halifax has long been known as the "City of Trees" because of the large mature trees that are planted in parks, line many city streets, and flourish on private property. There are thousands of old oaks, elms, lindens, maples, and copper beech along city streets, and in parks, that have been growing for the last century. These mature trees, together with younger age classes, collectively make up the urban forest which provides multiple benefits (Halifax Regional Municipality 2013). Management of the urban forest has implications for the health and integrity of urban watersheds. Perhaps the most critical relationship is the role of forested riverbank (riparian) buffer zones in protecting aquatic systems. As illustrated in Figure 4, The UFMP applies to the urban forest within an area extending 15 km out from the Halifax Harbour and geographically defined by HRM communities that receive water and wastewater services (Halifax Regional Municipality 2013). A series of destructive events, including the longhorn beetle infestation and Hurricane Juan accelerated the need for an Urban Forest Master Plan, which provides a comprehensive neighbourhood approach to maximizing the urban forest.

Urban forests require sustainable management focused on the ecological, economic, and social services trees provide, and particularly their contribution to human health and safety. Residents have expressed concern that forested areas surrounding urban areas are being clear-cut to make way for suburban development, thereby infringing on ecosystem, scenic and recreational values. Steps should be taken to identify and preserve the most cherished and accessible portions of these forests. These forests surrounding the urban centres are important wildlife corridors, allowing the movement of native species in and out of the urban area. Loss of these forests may lead to a reduction in urban biodiversity, as well as reduced access to natural habitats for urban residents.

Figure 4. HRM Communities in the UFMP

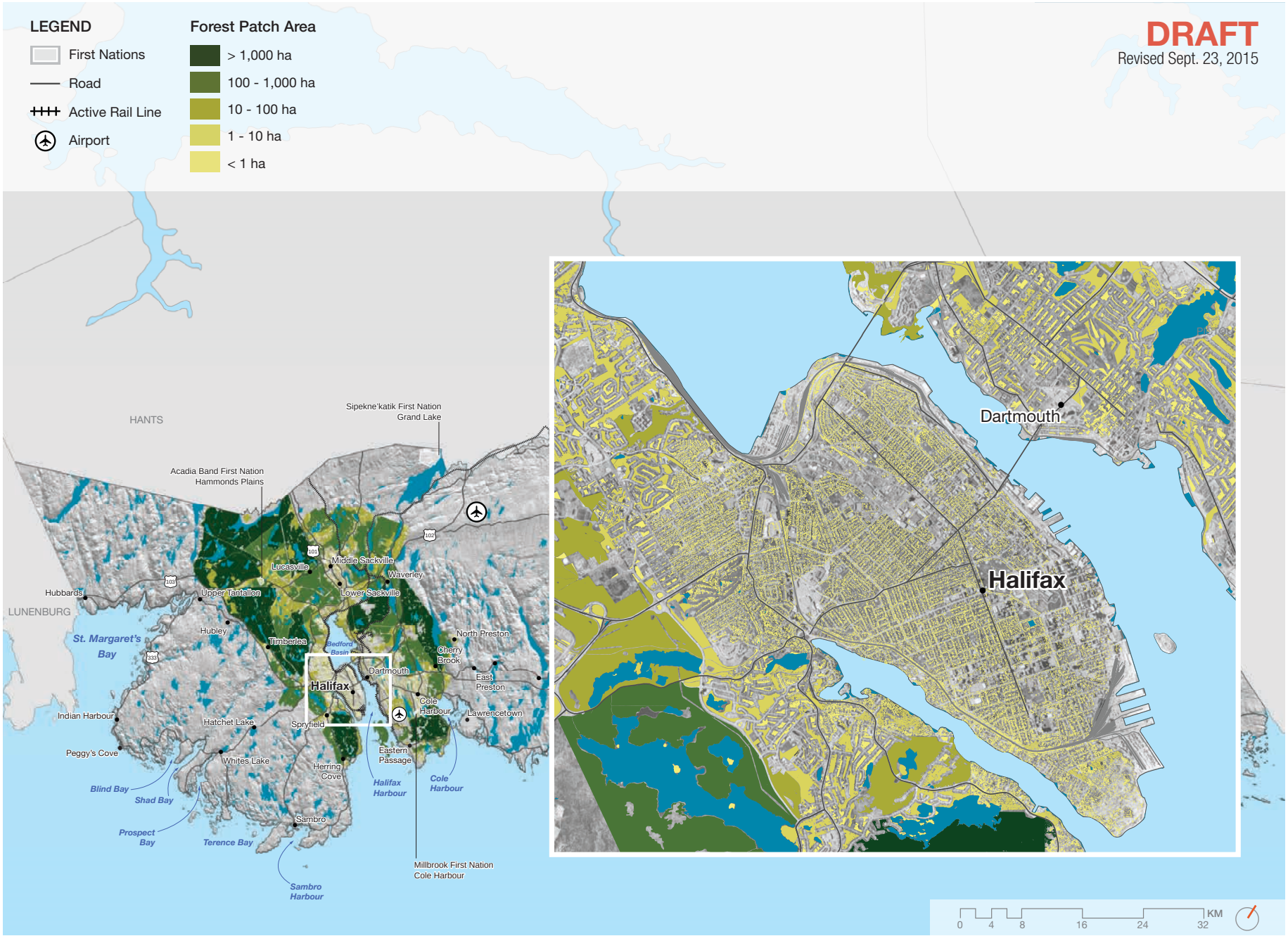


Currently, many trees in the HRM's urban parks face serious challenges. Canopy cover in most parks is limited and where canopy cover is good, many trees are nearing the end of their productive lives. Many street trees in the HRM were planted in the early twentieth century, resulting in entire neighbourhoods being dominated by mature, even-aged trees. While this creates spectacular and iconic neighbourhoods, these trees are nearing the end of their lives, creating potential hazards throughout these neighbourhoods. The management of these trees requires careful thought as to the staging of removal and replanting, to ensure that the neighbourhoods are not unduly disturbed during the transition.

Current age-class distribution is skewed towards mature and over-mature classes with underrepresentation of young and immature classes. The uniform age of these trees mean that a triage approach will be necessary to identify and target trees in immediate need of attention, while ensuring that a longer-term phased approach replaces neighbourhood trees. With 438 parks, consisting of 1,369 hectares of land within the UFMP study area, several thousand new trees should be planted over time to ensure the species and age diversity required for a healthy urban forest (Halifax Regional Municipality 2013).

Given that urban trees represent the only form of city infrastructure that actually increases in value over time, it is especially important to replace trees when they die, and to enhance the urban forest as a critical component of the green network.

Map 50. Urban Forest Cover



3.5 CULTURAL LANDSCAPES

Values: Cultural landscapes, including their historical context and land uses, are the foundations for the communities' sense of place and identity.

VALUES TO RECOGNIZE IN THE HGNP

- Sites and areas protected and regulated by the federal, provincial and municipal governments for their historic cultural value.
- Sites and areas identified by community stakeholders as having regional and community cultural significance.
- Sites and areas identified by cultural experts including historians, cultural and historical geographers, museum curators, archaeologists, and indigenous and ethnic community representatives.
- Sites and areas that exhibit characteristics outlined in the Standards and Guidelines for the Conservation of Historic Places in Canada, Section 4.1: Guidelines for Cultural Landscapes including Historic Districts:
  - Evidence of Land Use
  - Evidence of Traditional Practices
  - Land Patterns
  - Landform
  - Built Features
  - Spatial Organization
  - Visual Relationships
  - Circulation
  - Ecological Features
  - Vegetation

KEY ISSUES

- The HRM does not currently have a comprehensive inventory of cultural assets, nor has there been targeted research into the significance and character of its cultural landscapes. This lack of baseline data has presented difficulties in determining the significance of these resources and how they fit into the open space network.
- The HGNP is a starting point in identifying potential cultural landscapes and developing the building blocks for a cultural landscape program with guidance on how to identify, evaluate, and conserve cultural landscapes. The development of a cultural landscape program will require the commitment of resources to further this work through the Culture and Heritage Priorities Plan and future secondary planning exercises.
- The Province is currently developing amendments to the *Heritage Properties Act* to provide rules and regulations for municipalities in the identification, treatment and management of cultural landscapes. Provincial representatives advise the intent of the amendments are, amongst other things, to provide municipalities with clarification in the application of the rules and regulations as regards the interrelationship of Heritage Conservation District and Cultural Landscapes.
- In the absence of provincial regulations for cultural landscapes, and in light of the uncertainty this creates, it will be important for the HRM to consider a range of options for the treatment of potential cultural landscapes.
- Identification of areas of cultural landscape significance during the development of Open Space Scenarios for the HGNP will require consistent and timely ongoing engagement with community's and property owners to ensure there is clarity of understanding of the Study's proposed objectives for cultural landscape identification. It is critical that stakeholder engagement is maintained throughout the development of the HGNP and specifically that pre-emptive action is undertaken with regard to engagement with communities regarding any preliminary identification of areas of cultural landscape significance.
- The lack of adequate mapped data (e.g. hunting and gathering areas) on the pre-and post-contact landscapes of the indigenous peoples is a major issue that must be addressed to ensure the fullest picture possible is developed for the evolution of the region to the present day.

- The meaningful engagement of representatives of the Mi'kmaq peoples is essential to ensure the identification of the complete range of landscapes of cultural significance are addressed in the HGNP.

KEY OPPORTUNITIES

- Citizens of the many and varied communities in the HRM have expressed a strong interest in, and concern for, the protection and management of landscapes they consider to be important to the unique sense of place that defines each of their communities. There is a tremendous interest in their ongoing involvement and engagement.
- Over 1,000 comments relating to landscapes of cultural significance were provided by stakeholders in communities across the HRM and from these, a preliminary database of over 200 places and districts of cultural significance was developed and mapped deriving from the first phase of engagement. These places and districts represent significant community social, cultural, and heritage values. It is expected that this number will increase as stakeholder engagement continues throughout each phase of the HGNP. This preliminary database will also be a valuable resource for the upcoming cultural mapping and asset inventory phase of the Culture and Heritage Priorities Plan.
- Experts in the academic, museum, and cultural communities are providing information to assist the evolving study of cultural landscapes within the HRM and will participate in ongoing reviews of the cultural landscape component of the HGNP and the potential future development of a cultural landscape program.
- Discussions between the HRM and the Department of Communities, Culture and Heritage are at the earliest opportunity focusing on potential draft amendments to the *Heritage Property Act* regarding Cultural Landscapes and their relationship to Heritage Conservation Districts would valuably assist the development of the Cultural Landscape Study.
- The Cultural Landscape Framework Study for the HGNP provides an opportunity for the HRM to position itself to take full and timely advantage of proposed amendments to the *Heritage Properties Act* in the identification, management, and protection of cultural landscapes.
- The East Preston Cultural Landscape Report (2006) provides an excellent template for potential future area-specific studies in the HRM of cultural landscapes identified through the HGNP.

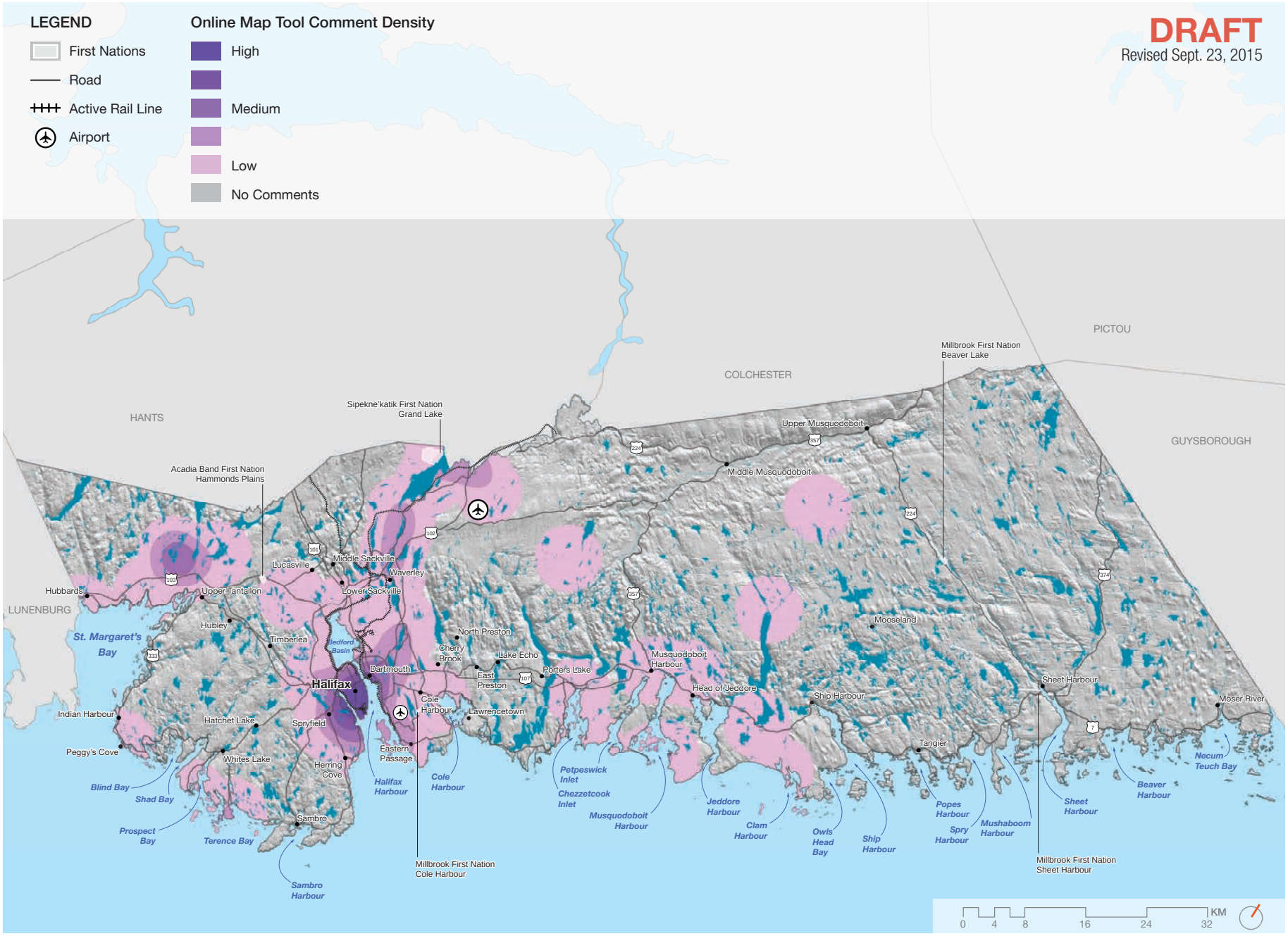
GENERAL DISCUSSION

Cultural landscapes define our sense of place in the communities in which we live. Cultural Landscape theory was first formulated by the International Committee of Monuments and Sites (ICOMOS) in direct response to the recognition that historic sites are an integral part of larger contexts and that their significance depends to a large degree on the authenticity and management of their settings. As urbanization and its effects continue to be felt across the globe, international governments have developed standards for the identification, treatment and management of cultural landscapes in order to address communities' growing concerns for the protection of landscapes of significance. Canada, a signatory to ICOMOS, developed the Standards and Guidelines for the Conservation of Historic Places in Canada in 2003 and these were amended to include Cultural Landscapes in 2010. Subsequently, the Province amended the *Heritage Properties Act* to include Cultural Landscapes. The HRM formally adopted the Standards and Guidelines in 2014 and these will guide the evolution of the cultural landscape component of the HGNP.

This section focuses on the cultural significance, attributed by a broad spectrum of citizens, to specific landscapes within the HRM. Cultural landscapes define our sense of place in the communities in which we live. They are the direct result of the interactions over time between people and the specific geographic area they inhabit. Online public consultation has provided a useful overview of the areas which have been publicly identified as important, valued, or at risk (Map 51).

The HRM is blessed with a wide range of cultural landscapes that reflect the specific land usage characteristics of the original indigenous peoples of the region and those of the varied ethnicities that settled in the region over time. Each community of interests has brought distinctive elements to bear upon the

Map 51. Density of Online Public Comments – Cultural Landscapes



land. These elements, often in complex combination with other landscapes, form the cultural landscapes that the citizens of the HRM value and wish to protect for the benefit of future generations. Cultural landscapes elements include, but are not limited to, commemorative sites, spiritual sites, remnant military installations, industrial and working landscapes, docklands, scenic viewsheds and roadways, coastal villages and their churches and lighthouses, urban commercial and residential areas and the multitude of trails, parks and open spaces throughout the region. Cultural landscapes occur at all scales in the HRM. They may form important regional path and roadway systems as in the cases of the Musquodoboit Valley and the Shubenacadie Canal, they may be discrete urban areas within larger districts such as the Hydrostone and the Barrington Street districts, or smaller coastal villages anchored historically by churches and lighthouses or, they may be smaller nodes within larger cultural complexes as are the Halifax Public Gardens. At whatever scale they occur they are key elements within a complex of larger systems. The protection and conservation of the intrinsic and characteristic value of each these resources is an important component of the HGNP.

3.5.1 Thematic Framework for the Identification of Cultural Landscape Elements

The preliminary thematic framework for the identification and categorization of potential cultural landscape elements during phase one of engagement was developed through a literature and data review of documents identified or provided by the HRM, detailed discussions with key HRM staff and experts from the cultural heritage field and related disciplines.

Settlement, Expulsion, Resettlement and Expansion Adaptations to the Land by Choice and by Force

The history of the lands that were to become the present day HRM in the Province of Nova Scotia is a complex story of displacements, expulsions, resettlements, emigrations, settlements and ongoing immigration of a broad mosaic of ethnicities. The history of the formative first 100 years of the region beginning in 1748 is characterized by adaptations to the land by choice and by force over time. The primary theme of how people adapted to the land, and how the land was altered in the process is the prism through which each of the following sub-themes was developed for the identification of cultural landscapes. It is also the preliminary evaluation of their significance to the evolving story of the HRM and its citizens.

Era and Events

- Pre-Contact
- Contact
- Colonial Hegemonic Conflict: France and Britain
- British Colonial Consolidation and Confederation
- Post Confederation to 1913
- World War I, Interwar, World War II
- Post War: Urbanization, Regional Outmigration and Exurbia

Cultural Groups and Influences: Tangible and Intangible The Communities' Stories

- The Indigenous Peoples
- Acadians and French Protestants
- British Isles
- Afro-Caribbean Maroon United Empire Loyalists
- European
- Other

Geographical Features

- Ocean, Harbour and River
- River and Lake System
- Upland and Valley
- Soils and Vegetation

Land Use

- Defence: Military and Naval
- Governance and Institutional
- Residential: urban and rural
- Fishing and Hunting
- Agriculture
- Forestry
- Mining

3.5.2 Cultural Landscape Elements

Communities across the HRM contributed to the development of an initial and preliminary database of over 200 sites and landscapes of cultural significance across the region during the first phase of engagement for the HGNP.

Map 52 outlines the location, range, and types of cultural landscapes identified to date. These places and districts were identified by stakeholders for their significant community social, cultural, and heritage value. This database will increase and be further refined as stakeholder engagement continues throughout each phase of the HGNP.

The map includes a wide range of landscape resources at small, medium, and large scales that, in combination, define the region's unique and valued sense of place. The database includes traditional pathways and transportation corridors, such as the Shubenacadie Canal; stand-alone historic designed landscapes, such as the Halifax Public Gardens; designed and evolved urban areas and districts, such as the Hydrostone and the Barrington Street historic corridor; vernacular landscapes that evolved over time from traditional patterns of use, such as the Musquodoboit Valley; industrial landscapes, such as the fragile North and South Shore coastal fishing villages; ethnographic landscapes and commemorative landscapes; provincially and municipally regulated heritage properties; and much-loved scenic viewsheds across the region. Taken together these cultural resources, preliminarily identified by the region's citizens will make a substantial contribution to the HRM's evolving understanding of cultural landscapes and their recognition will contribute to ongoing policy, development, and management for their protection.

Key Cultural Landscape thematic elements for the HGNP have been established through the first phase of engagement and reflect historic settlement patterns, their related ethnicities, and the interactions over time of these communities with the regional geography.

The methodology for the grouping of elements derives from cross referencing the Model Criteria for the Cultural and Heritage Model (EDM 2005), with findings from stakeholder workshops and meetings with acknowledged experts identified by the HRM and the museum community from the fields of indigenous ethnology, cultural and historical geography, archaeology, landscape architecture, and local and regional history. Taken together the findings have been instrumental in providing a rational preliminary basis for the mapping of Stage 1 cultural landscape elements derived from the broad spectrum of the first phase of engagement across the HRM.

The Cultural Landscape Elements map (Map 52) defines broad classes of site and area types that include a range of sub-categories of cultural landscape elements outlined in the accompanying key. This map and accompanying key has been prepared for discussion purposes and will be reviewed, revised and expanded as new information becomes available throughout the development of the HGNP. The key was prepared cross-referencing data provided during the stakeholder workshops and meetings. Due to the complexity of the elements and the scale of mapping, only broader classes are indicated on this map. The broader classes are

listed below together with the subclasses of cultural landscape elements identified to date. Maps are in development for the next phase of HGNP that will include a more detailed legend for sub-areas within the region. A digital online version of the map will also be prepared to allow for full resolution of site specific details and associated information.

The following classes are mapped:

MAP 52 KEY

Sites of Worship

- Mi'kmaq Spiritual Site
- Cemetery
- Church
- Convent

Indigenous Use

- Mi'kmaq Use
- Mi'kmaq Use and Occupancy

Ethnic Settlement, Re-Settlement

- Acadian
- British Isles (missing data)
- Black, Maroon
- French Protestant
- Icelandic

Military Use

- Fortifications
- Docklands
- DND Lands

Transportation

- Trail
- Historic Road
- Canal
- Railway
- Bridge

Urban Landscapes

- Main Street Comm. / Res.
- Residential Subdivision (missing data)
- CMHC Garden Residential
- Park
- Commons
- Public Square
- University
- Institutional
- Community Centre
- Community Museum

Natural Resource Use

- Fishing
- Mining
- Logging/ Milling
- Industrial Site
- Agriculture

Natural Features

- Beach

Regulated Heritage Sites

- *Heritage Property Act* Site
- Heritage Conservation District
- Preservation Area (Peggy's Cove Commission)
- *Special Places Act* Site
- Viewsheds

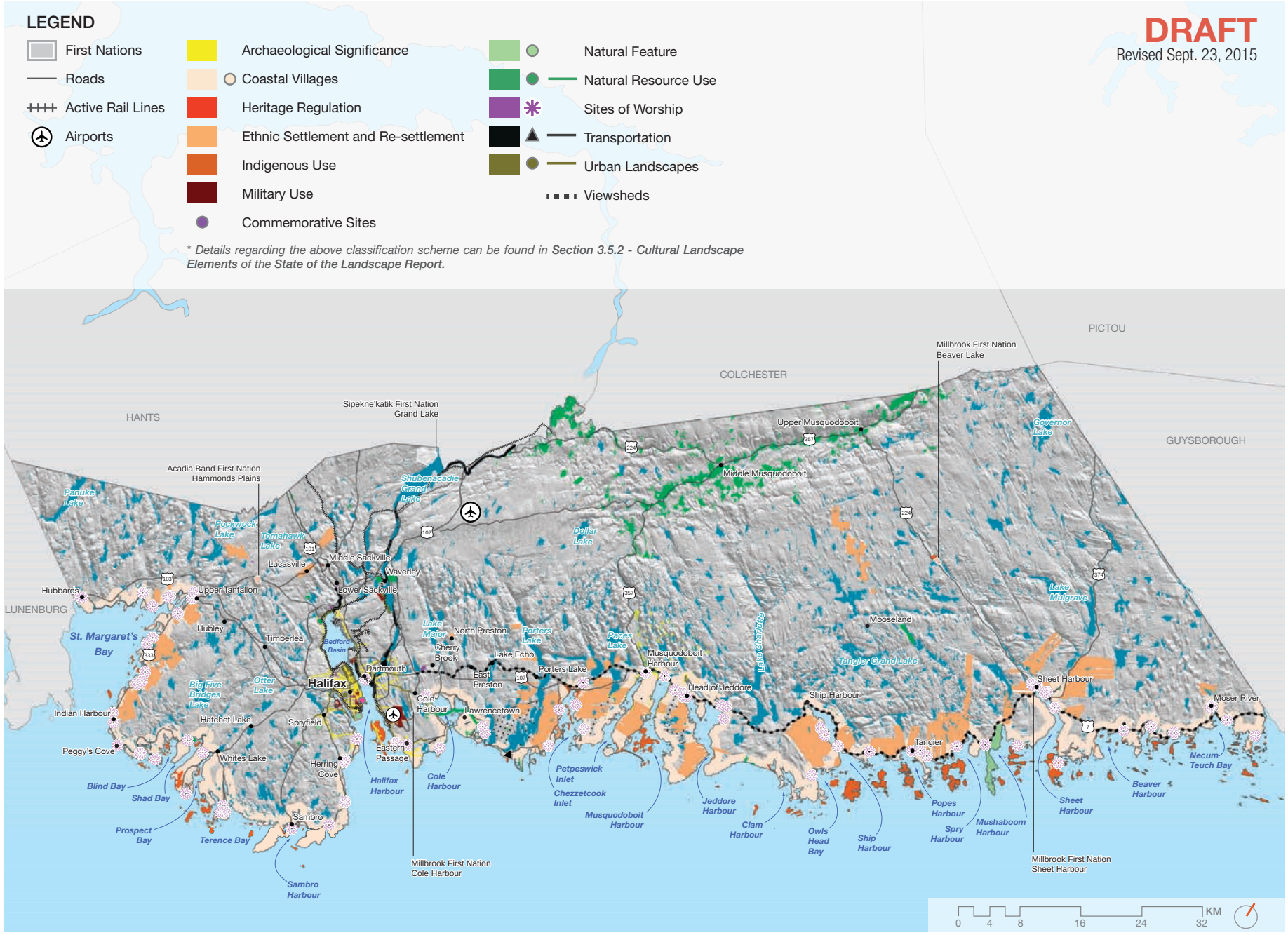
Archaeological Significance

- Archaeological Site

Commemorative Site

- Monument

Map 52. Halifax Regional Municipality Cultural Landscape Elements Phase 1



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