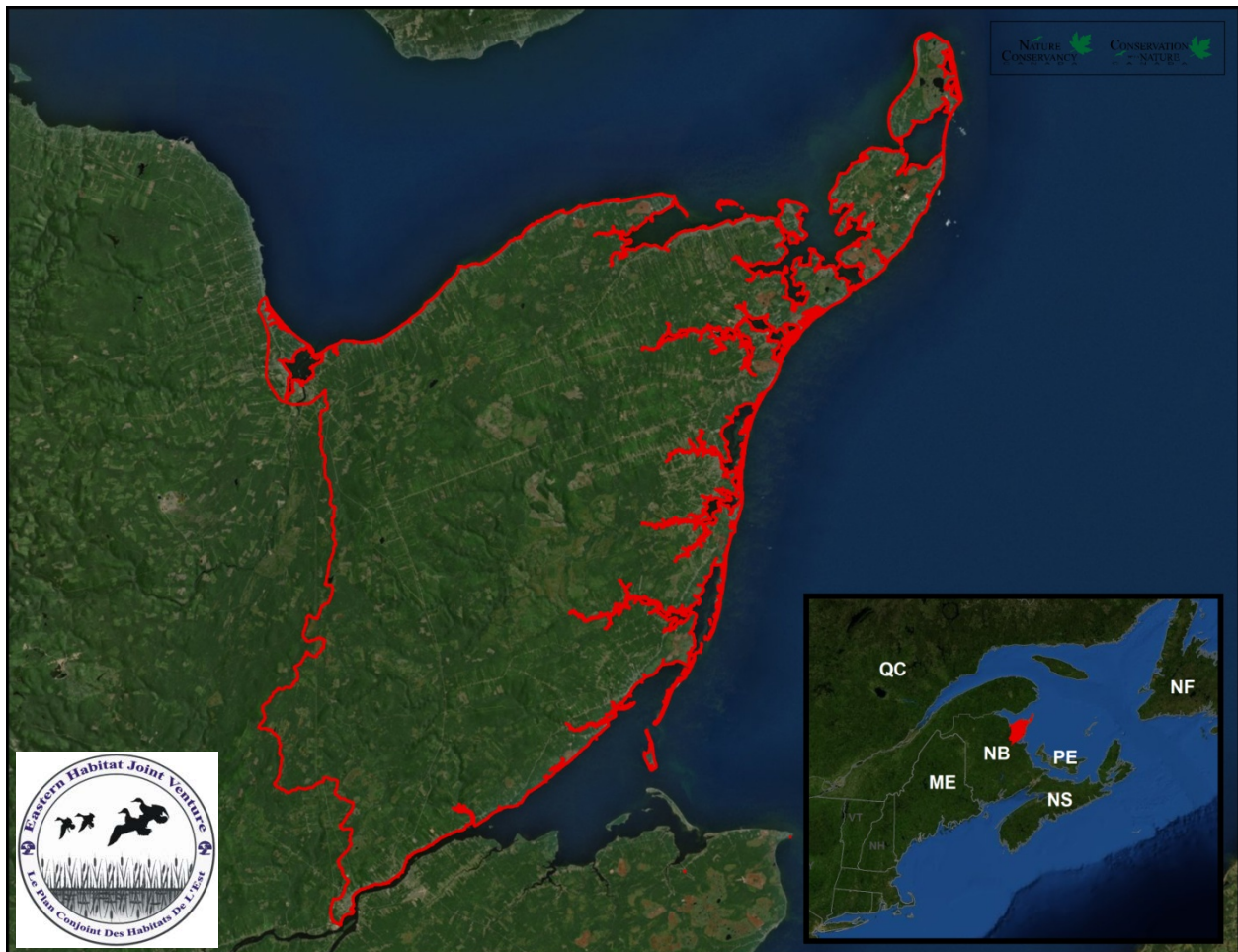

Acadian Peninsula Bioregion Habitat Conservation Strategy



**New Brunswick Eastern Habitat Joint Venture Steering Committee
September 2013
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New Brunswick Acadian Peninsula Bioregion

Habitat Conservation Strategy

EXECUTIVE SUMMARY

This Habitat Conservation Strategy (HCS) was developed through collaboration among member organizations of the Eastern Habitat Joint Venture (EHJV) New Brunswick Steering Committee and partner conservation groups. This HCS is part of a series planned to encompass the entire geographic area of New Brunswick.

HCSs are intended to respond to the need to better communicate, coordinate, and inform conservation actions taken by regional and local conservation organizations. It also is hoped that HCS development will create opportunities to enhance partnerships among these groups. Recognizing that each organization is guided by its own particular mission and/or guiding principles; information presented within each HCS is intended to serve as a decision-support tool.

Goals

The conservation goals that have been identified to guide the development of the Acadian Peninsula Habitat Conservation Strategy are:

- 1) Identify key conservation areas that are critical for priority conservation species and habitats.
- 2) Establish, support, and enhance conservation partnerships to facilitate decision-making and focus collective conservation efforts.
- 3) Maintain healthy, intact, and fully functioning ecosystems by building on existing conservation work by the partnership and informing efforts to acquire land for conservation.
- 4) Support the management of and protect corridors between existing protected areas and other conservation lands through land securement, partnerships, and community outreach.
- 5) Support the recovery of populations of species at risk through collective conservation actions by the partnership.
- 6) Support the advancement of collaborative ecosystem and species research to inform decision-making and planning.
- 7) Support the advancement of community support and understanding of biodiversity values, and inform local stewardship initiatives.

Ecological Context

Located on the northeastern coast of New Brunswick, the 416,553 ha Acadian Peninsula Bioregion has visually spectacular and biologically important wetlands, coastal habitats and barrier beaches. This area contains eight Important Bird Area sites as well as a RAMSAR Wetland of International Importance. Colonies of Black-crowned Night Heron (*Nycticorax nycticorax*), Great Blue Heron (*Ardea herodias*), Double-crested Cormorant (*Phalacrocorax auritus*), Common Tern (*Sterna hirundo*) and other seabirds occur at coastal sites within this bioregion. Other coastal sites in the bioregion are significant in the migration of several species of waterfowl and shorebirds. The Acadian Peninsula Bioregion provides habitat for 20 COSEWIC ranked species. Five species in the Acadian Peninsula Bioregion are globally significant (G1-3 ranked). The Piping Plover (*Charadrius melodus melodus*), which is nationally endangered and globally rare, nests on beaches in the bioregion while endemic species such as the nationally endangered Maritime Ringlet (*Coenonympha nipisiquit*) and threatened Gulf of St. Lawrence Aster (*Symphyotrichum laurentianum*) are found in coastal marshes of this Bioregion.

Natural resources and seasonal industries constitute the primary economic base for many towns and villages on the Acadian Peninsula Bioregion. While traditional land uses remain important, the emphasis is changing towards recreational development. Because of the aesthetic and recreational attributes of coastal areas, there is a growing demand for these lands and development pressures are increasing. However, the Acadian Peninsula Bioregion continues to exhibit some of the most significant undeveloped habitat found anywhere in the Maritimes. Therefore, significant conservation opportunities still exist but time is of the essence.

EHJV partners have been active in this Acadian Peninsula Bioregion since the early 1990s. For example NCC has secured 671 ha in five different focal areas.

An analysis of the bioregional distribution and habitat requirements of BCR 14 priority bird species for conservation, rare species (COSEWIC assessed, SARA listed, provincially listed, S and G Ranks), the distribution and abundance of habitat types, as well as threats to the above was used to identify priority habitats for conservation in a spatially explicit manner.

Conservation Priority Habitat Types

The habitat types that are a conservation priority are:

- 1) Beaches and Dunes;
- 2) Salt Marshes;
- 3) Freshwater Wetlands;
- 4) Forest Mosaic;
- 5) Coastal Islands;
- 6) Grasslands.

Most Important Threats

The following four threats have been identified as medium to high for these habitats:

- 1) Cottage and residential development
- 2) Peat harvesting
- 3) Sea-level rise and erosion
- 4) Incompatible forestry activities

Conservation Objectives

The conservation objectives for these habitats are:

1. Maintain ecological integrity of coastal systems, freshwater wetlands and significant forests by securing land, building on existing conservation work by EHJV partners in order to maximize impact on landscape.
2. Advance and support broader conservation partnerships in the Acadian Peninsula Bioregion, for example with Watershed Conservation groups, municipalities.
3. Maintain existing populations of Species at Risk and protect critical habitat for these species.
4. Apply adaptive management principles to the conservation of biodiversity, natural processes and threats on conservation lands within the Acadian Peninsula Bioregion.
5. Support ecotourism and public land management initiatives that have minimal impacts on the Bioregion's biodiversity targets
6. Advance community support and awareness for conservation of sensitive ecosystems throughout the Acadian Peninsula Bioregion.

Conservation Actions

Government of New Brunswick (GNB)

- Achieve Protected Natural Area designation of up to 12,000 ha of significant habitat on Crown land within the Bioregion.
- Implement sustainable forest management on Crown lands including the conservation of priority forest wildlife habitats and ecological systems (biodiversity).
- Implement the New Brunswick Clean Environment Act, Clean Water Act, Wetland Conservation Policy and Coastal Areas Protection Policy to conserve the ecological, economic and social functions of these ecological communities.
- Continue to support ENGO work on habitat and ecological system conservation/stewardship through direct and in-kind support (Examples: New Brunswick Wildlife Trust Fund, Environmental Trust Fund).

Bird Studies Canada (BSC)

- Complete reports on habitat associations and threats to grassland birds by 2013 using data from the recently completed Maritime Breeding Bird Atlas.

Nature Conservancy of Canada (NCC)

- Secure 400 ha of priority native/natural lands by 2017 of which at least 380 ha are Priority 1 or Priority 2 and no more than 20 ha are Priority 3 or other.
- Update landowner contact database by adding contacts in new active focal areas by 2013.
- Re-assess status of target viabilities and threat ranks at bioregion scale for next generation NACP by 2017.

- Update land prioritization within the Bioregion to account for new protected areas designated by the province under action 1.1.2 by 2013.
- Prepare Interim Stewardship Statements within one year and Property Management Plans following NCC's approved Stewardship Performance Standards for secured properties.
- Implement critical Property Management Plan actions on NCC lands through 2017.
- Monitor NCC properties annually for impacts from aquaculture sites and ATV use and respond to any potential threats to biodiversity targets.
- Participate annually in active recovery planning meetings for Species at Risk (currently only Piping Plover).
- Strengthen partnership with Atlantic Conservation Data Centre (ACCDC) through annual submission of monitoring findings on NCC properties.
- Host at least one annual community outreach event or Conservation Volunteer event in the Bioregion.
- Enhance public understanding of and support for conservation through a minimum of three targeted media hits covering work in the bioregion between 2012 and 2017.
- Attend partnership meetings and any relevant ecotourism development meetings on on-going basis to build and strengthen partnerships.

Government of Canada (GC)

- Continue to support ENGO work on Species at Risk such as Habitat Stewardship Program funding for Piping Plover stewardship.
- Continue migratory bird surveys including those for Piping Plover.
- Assess impacts of sea-level rise and storm events on Piping Plover and their habitat.
- Identify important areas for marine birds.
- Continue management activities associated with Inkerman Migratory Bird Sanctuary and Portage Island NWA.
- Implement the Migratory Bird Convention Act, Canada Wildlife Act, Species at Risk Act, Canadian Environmental Protection Act, Federal Policy on Wetland Conservation
- Continue to support ENGO work on habitat and ecological system conservation/stewardship through direct and in-kind support (Examples: Ecological Gifts Program; Environmental Damages Fund, Eco Action, Atlantic Ecosystem Initiative, Natural Areas Conservation Partnership).

Nature Trust of NB (NTNB)

- The Nature Trust of New Brunswick will continue to explore partnership and land acquisition opportunities in the Acadian Peninsula Bioregion, particularly within the Nicolas Denys Ecodistrict – an area identified in 2008 by the NTNB as a potential Conservation Planning Focus Region.
- The NTNB will work towards maintaining bilingual capacity and will build partnerships with other provincial and local organizations to increase our presence in the area.
- The NTNB will continue to educate and work with previously contacted landowners whose properties host Maritime Ringlet butterfly habitat.
- The NTNB will continue to work with landowners interested in land conservation and will support other organizations in strengthening their conservation efforts in the area.
- The NTNB will host an annual presentation in the Bathurst area to educate local citizens about the Nature Trust and local land conservation matters.

Biorégion de la péninsule acadienne

Stratégie de conservation des habitats de 2013

SOMMAIRE

Cette Stratégie de conservation des habitats (SCH) a été mise au point grâce à la collaboration entre des organisations membres du Comité directeur du Plan conjoint des habitats de l'Est (PCHE) pour le Nouveau-Brunswick et des groupes de conservation partenaires. Cette SCH s'inscrit dans le cadre d'une série prévue pour englober toute la région géographique du Nouveau-Brunswick.

Les SCH visent à répondre au besoin de coordonner et de communiquer plus efficacement les mesures de conservation adoptées par les organisations de conservation locales et régionales. On espère également que l'élaboration de SCH créera des occasions d'améliorer les partenariats entre ces groupes. Compte tenu du fait que chaque organisation est guidée par sa mission ou ses principes directeurs, l'information présentée dans le cadre de chaque SCH est destinée à servir d'outil d'aide à la prise de décisions.

Située sur la côte nord-est du Nouveau-Brunswick, la biorégion de la péninsule acadienne, d'une superficie de 416 553 hectares, compte des terres humides, des habitats côtiers et des cordons littoraux visuellement spectaculaires et importants sur le plan biologique. Cette région comporte huit zones importantes pour la conservation des oiseaux, ainsi qu'une zone humide Ramsar d'importance internationale. On y trouve des colonies de Bihoreaux gris (*Nycticorax nycticorax*), de Grands hérons (*Ardea herodias*), de Cormorans à aigrettes (*Phalacrocorax auritus*), de Sternes pierregarins (*Sterna hirundo*) et d'autres oiseaux de mer sur les sites côtiers. D'autres sites côtiers de la biorégion sont importants pour plusieurs raisons, la plus notable étant probablement leur rôle de corridor migratoire et d'escale pour plusieurs espèces d'oiseaux aquatiques et de rivage. La biorégion de la péninsule acadienne sert d'habitat à 20 espèces classées par le COSEPAC, dont cinq sont d'importance internationale (classées de G1 à G3). Le Pluvier siffleur (*Charadrius melodus melodus*), une espèce en voie de disparition au pays et rare à l'échelle mondiale, niche sur les plages de la biorégion. Les espèces endémiques telles que le Satyre fauve des Maritimes (*Coenonympha nipisiquit*) (en voie de disparition) et l'Aster du golfe Saint-Laurent (*Symphyotrichum laurentianum*) (espèce menacée) nichent dans les marais côtiers de cette biorégion.

L'extraction des ressources naturelles et les industries saisonnières sont à la base de l'économie d'un grand nombre de villes et de villages de la biorégion de la péninsule acadienne. Bien que l'utilisation traditionnelle des terres demeure importante, l'accent se déplace vers l'aménagement à des fins récréatives et le récréotourisme. En raison du caractère esthétique et récréatif des zones côtières, la demande pour ces terres est en croissance, tout comme les pressions de développement dont elles font l'objet. Néanmoins, la biorégion de la péninsule acadienne continue d'abriter certains des habitats non exploités les plus importants dans les Maritimes. Pour cette raison, il existe encore d'importantes possibilités de conservation, mais le temps presse. Les partenaires du PCHE jouent un rôle actif à cet égard dans la biorégion depuis le début des années 1990. L'organisme Conservation de la nature Canada (CCN) y a notamment préservé 671 hectares dans cinq zones névralgiques.

Une analyse détaillée de la répartition biorégionale et des besoins en matière d'habitat d'un certain nombre d'espèces importantes a été entreprise aux fins du présent exercice. On entend par espèce importante toute espèce d'oiseau prioritaire pour la conservation et classée ROC 14, toute espèce rare évaluée par le COSEPAC, répertoriée dans la LEP ou les listes provinciales ou de rang S1 et S2, ou encore toute espèce de rang S3 également considérée comme rare à l'échelle mondiale (de rang G1 à G3). Par

ailleurs, la répartition et l'abondance des types d'habitats nécessaires pour ces espèces ainsi que les menaces qui pèsent sur elles et leur habitat ont servi à déterminer d'une manière spatialement explicite les habitats prioritaires pour les mesures de conservation.

Les SCH visent à répondre au besoin de coordonner et de communiquer plus efficacement les mesures de conservation effectuées par les organisations de conservation locales et régionales. On espère également que l'élaboration de SCH créera des occasions d'améliorer les partenariats entre ces groupes. Compte tenu du fait que chaque organisation est guidée par sa mission ou ses principes directeurs, l'information présentée dans le cadre de chaque SCH est destinée à servir d'outil d'aide à la prise de décisions.

La façon dont les SCH sont élaborées vise à réduire la redondance, à améliorer l'efficacité et à faciliter la prise de décisions. Les processus d'identification et d'analyse des habitats et des espèces prioritaires pour la conservation sont élaborés par consensus des partenaires contributeurs. Les SCH présentent des descriptions générales des systèmes écologiques dominants, des processus et des portées biorégionale, géographique et temporelle. Elles déterminent l'importance concernant les habitats et les espèces prioritaires pour la conservation, y compris les espèces en péril, les espèces d'oiseaux prioritaires et les espèces rares. Même si ce contexte biorégional est présenté dans chacune des SCH et tiré de la littérature, la description écrite se veut approfondie, mais non exhaustive, puisqu'il existe de l'information plus détaillée et approfondie, bien référencée et généralement disponible.

Les SCH sont élaborées à une échelle écologiquement appropriée; les limites biorégionales sont fondées sur des unités écologiques significatives ou des limites d'importants bassins hydrographiques qui tiennent compte du contexte régional de conservation sur le plan des menaces et des mesures connexes. Les SCH voisines sont conçues pour avoir des limites contiguës et elles devraient, en fin de compte, couvrir les provinces de l'Atlantique. L'échelle sélectionnée vise à faciliter la mise en œuvre des mesures de conservation par différents groupes; non seulement par ceux qui sont intéressés par la préservation des terres et qui travaillent à l'échelle provinciale ou nationale, mais aussi par les organisations de conservation locales qui prennent part aux mesures locales d'intendance.

Cette SCH présente des cartes qui indiquent les emplacements spatiaux des habitats et espèces prioritaires pour la conservation dans chaque biorégion. L'ordre de priorité des habitats a été fondé sur l'unicité, la représentativité et la taille des parcelles de chaque habitat prioritaire, et ces éléments étaient ensuite combinés pour créer une carte composite de tous les habitats prioritaires. L'ordre de priorité des espèces a été obtenu en combinant des cartes de chaque espèce en fonction de la présence pour créer des cartes composites des espèces pour chaque ensemble de données (p. ex., les ensembles de données sur l'abondance relative et les indices de nidification discutés dans le Maritimes Breeding Bird Atlas (Atlas sur les aires de couvaison des oiseaux des Maritimes), et l'ensemble de données sur les espèces rares du Centre de données sur la conservation du Canada Atlantique). Ces cartes composites ont été à leur tour combinées pour créer une carte composite de la biodiversité de toutes les espèces. Les cartes composites de l'ordre de priorité des habitats et des espèces ont été ensuite combinées pour obtenir une carte affichant l'indice de valeur pour la conservation de la biorégion. Les différentes cartes indiquant les points chauds de divers groupes d'espèces présentent différentes perspectives, parfois contrastantes, sur les priorités spatiales. Ces priorités peuvent nécessiter des approches de conservation fondamentalement différentes. Aucune carte, y compris celle affichant l'indice de valeur pour la conservation, ne peut être considérée comme incluant tous les besoins en matière de conservation.

Même si une carte de l'ensemble des priorités de conservation (carte affichant l'indice de valeur pour la conservation) est présentée, elle est par définition influencée par les emplacements des habitats

prioritaires pour la conservation et fortement influencée par la cooccurrence d'espèces prioritaires pour la conservation. De plus, même si le sujet principal de l'ensemble des cartes des priorités de conservation peut correctement mettre en relief les sites d'importance pour la biodiversité en ce qui concerne les nombres élevés d'espèces attendues, il peut cependant ne pas mettre en relief les importants sites d'habitat pour ces espèces qui ont des besoins inhabituels en matière d'habitat ou les zones où il y a une grande abondance d'un nombre limité d'espèces. Bien que différents lecteurs peuvent prendre en considération la même carte des habitats prioritaires pour la conservation, leur choix de cartes des espèces prioritaires pour la conservation peut être différent, selon leurs besoins organisationnels, ce qui, en fin de compte, mène à des priorités spatiales variées pour un type d'habitat donné.

Les menaces aux habitats et aux espèces prioritaires pour la conservation sont déterminées, évaluées, et dans la mesure du possible, cartographiées à l'échelle biorégionale. La SCH présente également les mesures de conservation et d'intendance prises par les organisations pour atténuer les menaces et contribuer à la conservation des habitats et des espèces au cours de la période de planification des cinq prochaines années.

Bien qu'elle ne puisse être considérée comme complète, la section des mesures contenue dans cette SCH comprend une liste par organisation, et une matrice par habitat, des mesures de conservation qui sont effectuées et planifiées pour les cinq prochaines années. Les lacunes de cette section peuvent être interprétées comme des possibilités d'élaboration de nouvelles mesures de conservation complémentaires que les nouveaux groupes et les groupes existants peuvent entreprendre. Il est à noter que les groupes de conservation qui cherchent à obtenir du financement du gouvernement (p. ex., le Programme d'intendance de l'habitat (PIH), le Fonds autochtone pour les espèces en péril (FAEP), le Fonds en fiducie pour l'environnement, le Fonds de fiducie de la faune du Nouveau-Brunswick (FFNB)) pour mettre en œuvre des mesures de conservation dans la biorégion sont fortement encouragés à utiliser cette SCH, laquelle indique précisément les lacunes pertinentes et les possibilités déterminées dans les sections des mesures.

Ensemble, cette SCH et les produits cartographiques connexes serviront à donner de l'information sur les mesures de conservation et d'intendance des organisations dans la biorégion et à les orienter.

Objectifs

Voici les objectifs de conservation qui ont été déterminés pour orienter l'élaboration de cette SCH :

- 1) Déterminer les aires qui sont importantes pour la conservation des habitats et des espèces prioritaires.
- 2) Établir des partenariats de conservation, les appuyer et les améliorer afin de faciliter la prise de décisions et de centrer les efforts collectifs de conservation.
- 3) Maintenir les écosystèmes en bonne santé, intacts et entièrement fonctionnels en misant sur les travaux de conservation existants des partenaires et en guidant les efforts qui visent à acquérir des terres afin d'assurer leur conservation.
- 4) Appuyer la gestion et la conservation des corridors entre les aires protégées existantes et les autres terres protégées grâce à la préservation des terres, à des partenariats et à la sensibilisation communautaire (c.-à-d., l'intendance).
- 5) Appuyer le rétablissement de populations d'espèces en péril au moyen de mesures collectives de conservation menées dans le cadre d'un partenariat, davantage étayé par les ressources fédérales et provinciales sur les espèces en péril.
- 6) Appuyer l'avancement d'un écosystème collaboratif et de la recherche sur les espèces pour éclairer la prise de décisions et la planification.

- 7) Appuyer l'avancement du soutien communautaire et de la compréhension des valeurs de la biodiversité, et transmettre de l'information sur les initiatives locales d'intendance.

Nous espérons que vous trouviez cette SCH utile et nous encourageons votre collaboration avec le Comité directeur du PCHE pour le Nouveau-Brunswick dans des activités de conservation des habitats.

Les six types d'habitats qui constituent des priorités en matière de conservation pour la biorégion de la péninsule acadienne sont les suivants :

- 1) Plages et dunes
- 2) Marais salés
- 3) Terres humides d'eau douce
- 4) Mosaïque forestière
- 5) Îles côtières
- 6) Prairies

Les quatre menaces suivantes ont été qualifiées de moyennes à élevées pour ces habitats :

- 1) Construction de chalets et aménagement résidentiel
- 2) Exploitation de la tourbe
- 3) Hausse du niveau de la mer et érosion
- 4) Activités forestières incompatibles

Les objectifs de conservation pour ces habitats sont les suivants :

1. Conserver l'intégrité écologique des écosystèmes côtiers, des terres humides d'eau douce et des habitats forestiers d'importance en préservant les terres et en misant sur les travaux de conservation existants des partenaires du PCHE de façon à optimiser les répercussions sur le paysage.
2. Promouvoir et appuyer l'établissement de partenariats de conservation élargis dans la biorégion de la péninsule acadienne, par exemple, avec les groupes de conservation des bassins hydrographiques et les municipalités.
3. Maintenir et/ou rétablir les populations existantes d'espèces en péril et protéger les habitats qui leur sont essentiels.
4. Appliquer des principes de gestion adaptative à la conservation de la biodiversité, aux processus naturels et aux menaces qui pèsent sur les terres protégées de la biorégion de la péninsule acadienne.
5. Appuyer l'écotourisme et les initiatives de gestion des terres publiques ayant des répercussions minimales sur les objectifs en matière de biodiversité de la biorégion.
6. Promouvoir le soutien communautaire et la sensibilisation à la conservation des écosystèmes sensibles de la biorégion de la péninsule acadienne.

Les partenaires du PCHE mettront en œuvre les mesures de conservation particulières suivantes dans la biorégion de la péninsule acadienne :

Gouvernement du Nouveau-Brunswick

- Obtenir la désignation d'aire naturelle protégée pour une superficie d'habitats d'importance, sur les terres de la Couronne de la biorégion, pouvant atteindre 10 000 hectares.
- Mettre en œuvre la gestion durable des terres forestières de la Couronne, y compris la conservation des habitats fauniques prioritaires et des systèmes écologiques (biodiversité).
- Mettre en œuvre la *Loi sur l'assainissement de l'environnement*, la *Loi sur l'assainissement de l'eau propre*, la Politique de conservation des terres humides et la Politique de protection des

zones côtières du Nouveau-Brunswick de façon à conserver les fonctions écologiques, économiques et sociales de ces communautés écologiques.

- Continuer d'appuyer les travaux des OENG ayant trait à la conservation et à l'intendance des habitats et des systèmes écologiques au moyen d'un appui financier direct et d'une contribution en nature (exemples : Fonds de fiducie de la faune du Nouveau-Brunswick, Fonds en fiducie pour l'environnement).

ÉOC

- Produire les rapports sur les associations d'habitats et les menaces qui pèsent sur les oiseaux des prairies d'ici 2013 à l'aide des données du Maritime Breeding Bird Atlas (Atlas sur les aires de couvainement des oiseaux des Maritimes) récemment publié.

CNC

- Protéger 400 ha de terres autochtones/naturelles prioritaires d'ici 2017, dont au moins 400 ha ont un degré de priorité 1 ou 2 et dont au plus 20 ha ont un degré de priorité 3 ou autre.
- Mettre à jour la base de données des propriétaires privés en ajoutant des contacts pour les nouvelles zones névralgiques actives d'ici 2013.
- Réévaluer l'état des viabilités ciblées et de la classification des menaces à l'échelle biorégionale pour le prochain PCZN d'ici 2017.
- Mettre à jour l'ordre de priorité des terres de la biorégion pour tenir compte des nouvelles aires protégées désignées par la province en vertu de la mesure 1.1.2, d'ici 2013.
- Préparer des états d'intendance intermédiaires d'ici un an et élaborer des plans de gestion immobilière à la suite de l'approbation par CNC des normes de rendement d'intendance pour les propriétés protégées.
- Mettre en œuvre les mesures essentielles des plans de gestion immobilière sur les terres de CNC jusqu'en 2017.
- Surveiller annuellement les propriétés de CNC pour déterminer les répercussions des sites d'aquaculture et de l'utilisation de VTT, et réagir à toute menace éventuelle qui pèse sur les objectifs de biodiversité.
- Participer chaque année aux réunions de planification active du rétablissement des espèces en péril (seulement le Pluvier siffleur à l'heure actuelle).
- Renforcer le partenariat avec le Centre de données sur la conservation du Canada atlantique en présentant chaque année des données de surveillance sur les propriétés de CNC.
- Organiser chaque année dans la biorégion au moins une activité de sensibilisation communautaire ou une activité de bénévolat à l'appui de la conservation.
- Aider la population à mieux comprendre et à appuyer davantage la conservation en publiant au moins trois reportages dans les médias sur les travaux réalisés dans la biorégion de 2012 à 2017.
- Participer régulièrement aux rencontres de partenariat et à toute réunion pertinente ayant trait au développement de l'écotourisme, afin de conclure des partenariats et de les renforcer.

Gouvernement du Canada

- Continuer d'appuyer les travaux des ONG se rapportant aux espèces en péril tels que le financement du Programme d'intendance de l'habitat pour le Pluvier siffleur.
- Continuer de produire des relevés des oiseaux migrateurs, y compris pour le Pluvier siffleur.
- Évaluer les répercussions de la montée du niveau de la mer et des événements pluviaux hydrologiques sur le Pluvier siffleur et son habitat.
- Déterminer les zones importantes pour les oiseaux marins.
- Poursuivre les activités de gestion liées au refuge d'oiseaux migrateurs d'Inkerman et à la RNF de l'Île Portage.

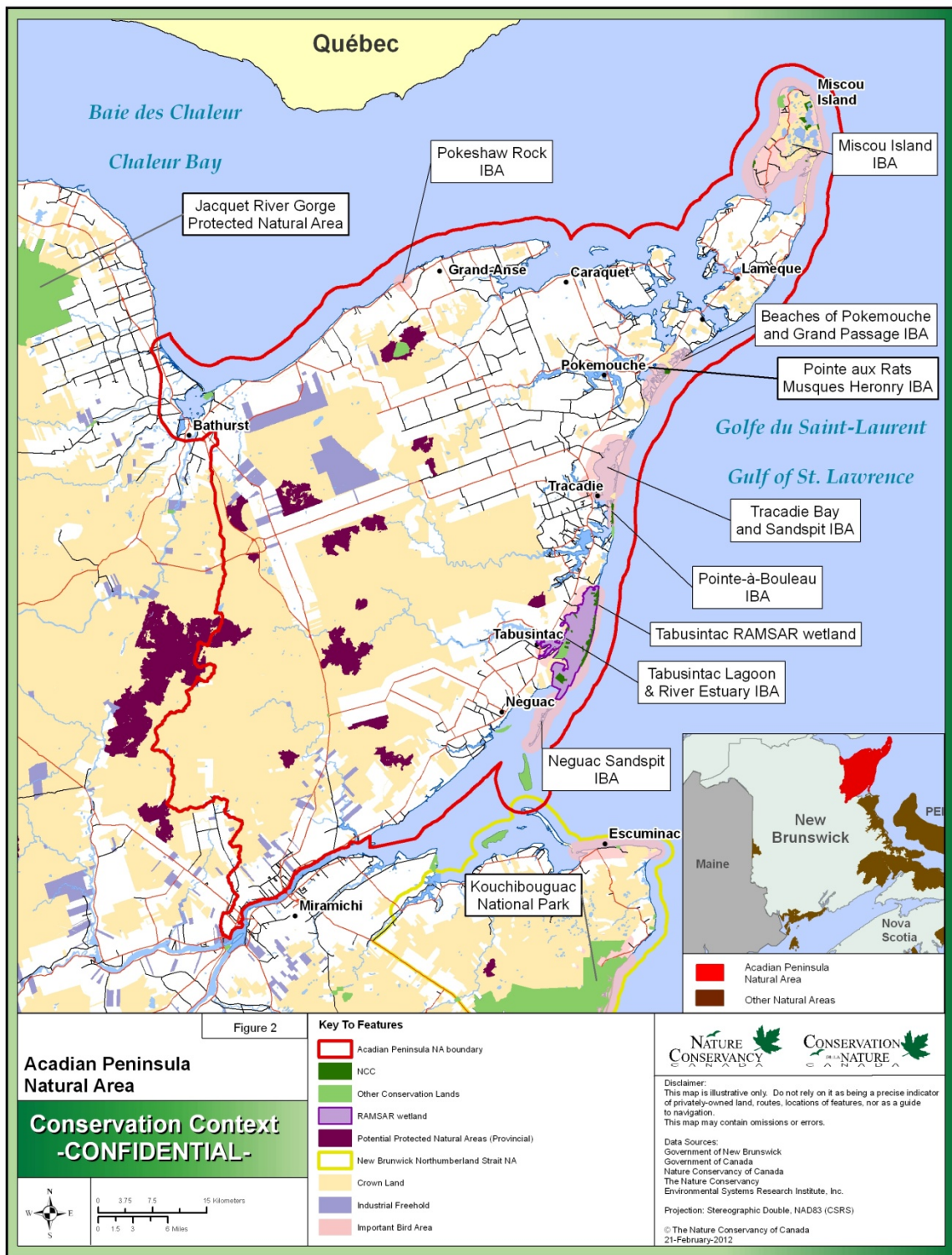
- Mettre en œuvre la *Loi sur la Convention concernant les oiseaux migrants*, la *Loi sur les espèces sauvages du Canada*, la *Loi sur les espèces en péril*, la *Loi canadienne sur la protection de l'environnement* et la politique fédérale sur la conservation des terres humides.
- Continuer d'appuyer les travaux des ONGE ayant trait à la conservation et à l'intendance des habitats et des systèmes écologiques au moyen d'un appui financier direct et d'une contribution en nature (exemples : Programme des dons écologiques, Fonds pour dommages à l'environnement, ÉcoAction, Initiative de l'écosystème de l'Atlantique, partenariat pour la conservation des zones naturelles).

Fondation pour la protection des sites naturels du Nouveau-Brunswick

- La Fondation pour la protection des sites naturels du Nouveau-Brunswick continuera d'explorer les possibilités de partenariats et d'acquisition de terres dans la biorégion de la péninsule acadienne, en particulier dans l'écodistrict Nicolas Denys, une région déterminée en 2008 par la Fondation comme étant une région cible potentielle pour la planification de la conservation.
- La Fondation s'efforcera de maintenir sa capacité d'offrir des services bilingues et établira des partenariats avec d'autres organisations provinciales et locales pour accroître sa présence dans la région.
- La Fondation continuera de sensibiliser les propriétaires fonciers qui ont déjà été approchés et dont les propriétés servent d'habitat au satyre fauve des Maritimes, ainsi que de travailler avec eux.
- La Fondation continuera de travailler avec les propriétaires fonciers soucieux de la conservation des terres et aidera d'autres organisations à renforcer leurs efforts de conservation dans la région.
- La Fondation présentera un exposé annuel dans la région de Bathurst pour renseigner les citoyens locaux à son sujet et les sensibiliser aux enjeux locaux en matière de conservation des terres.

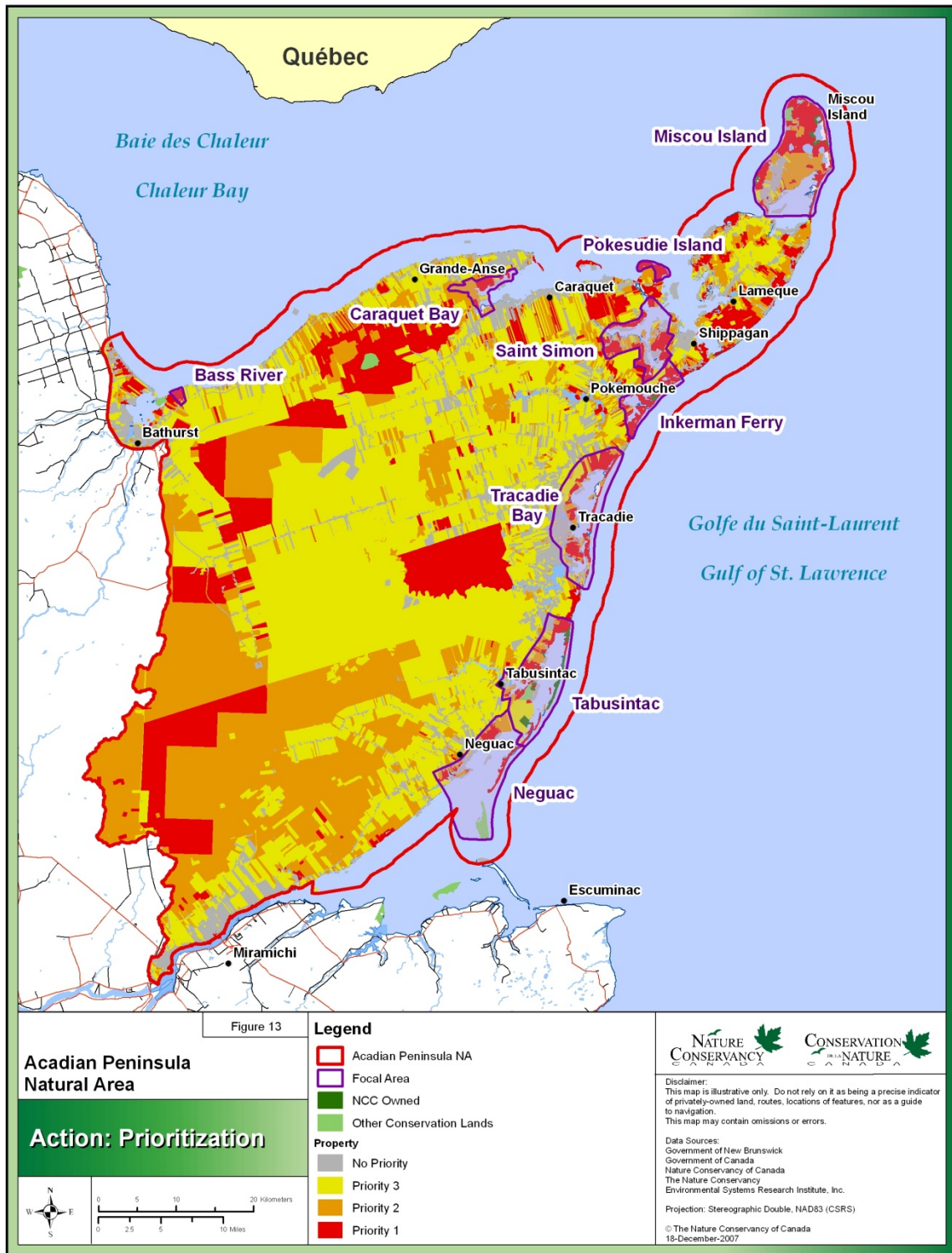
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Acadian Peninsula Bioregion Habitat Conservation Strategy

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I. CONSERVATION CONTEXT

This Habitat Conservation Strategy (HCS) was developed through collaboration among member organizations of the Eastern Habitat Joint Venture (EHJV) New Brunswick Steering Committee and partner conservation groups. This HCS is part of a series planned to encompass the entire geographic area of New Brunswick. HCSs are intended to respond to the need to better communicate, coordinate, and inform conservation actions taken by regional and local conservation organizations. It also is hoped that HCS development will create opportunities to enhance partnerships among these groups. Recognizing that each organization is guided by its own particular mission and/or guiding principles; information presented within each HCS is intended to serve as a decision-support tool.

The manner in which HCSs are developed aims to reduce redundancy, improve efficiency, and facilitate decision-making. The processes of identifying and analyzing conservation priority habitats and species are developed through consensus among contributing partners. HCSs present general descriptions of the bioregion, geographical and temporal scope, and dominant ecological systems and processes. The HCSs identify significance with regards to conservation priority habitats and species, including species at risk, priority bird species, and rare species. Though this bioregional context is presented in each HCS and drawn from the literature, the written narrative is meant to be thorough but not exhaustive as more detailed, in-depth information is well-referenced and generally available.

HCSs are developed at an ecologically appropriate scale; bioregional boundaries are based on meaningful ecological units or important watershed boundaries that capture regional conservation context in terms of threats and related actions. Adjacent HCSs are designed to have contiguous boundaries and ultimately are expected to span the Atlantic Provinces. The scale selected is intended to facilitate the implementation of conservation actions by various groups; not only by those interested in land securement working at a provincial or national scale, but also by local conservation organizations engaged in local stewardship actions.

This HCS presents maps that identify the spatial location of conservation priority habitats and species within each bioregion. Habitat prioritization was based on the uniqueness, representivity, and size of patches of each priority habitat, and then combined to create a composite map of all priority habitats. Species prioritization was achieved by combining individual species maps based on occurrence, to create species composite maps for each dataset (e.g. Maritimes Breeding Bird Atlas relative abundance and breeding evidence datasets, Atlantic Canada Conservation Data Centre rare species dataset). These composite maps in turn were combined to create a biodiversity composite map of all species. The habitat prioritization composite and species prioritization composite maps were then combined to yield a Conservation Value Index map of the bioregion. The different maps depicting hotspots of different suites of species present different and sometimes contrasting perspectives on spatial priorities. These priorities may require fundamentally different conservation approaches. No single map, including the Conservation Value Index map, can be considered inclusive of all conservation needs.

Though a map of overall conservation priority (Conservation Value Index map) is presented, it is by definition influenced by conservation priority habitat locations and strongly influenced by co-occurrence of conservation priority species. Though focus of the overall conservation priority maps may correctly highlight sites of importance to biodiversity in terms of elevated numbers of species expected, it may fail to highlight important habitat sites for those species with unusual habitat needs, or areas of high abundance of a limited number of species. Although different readers may consider the same conservation priority habitat map, their choice conservation priority species maps may be different,

based on their organizational needs, ultimately leading to different spatial priorities for a given habitat type.

Threats to conservation priority habitats and species are identified, assessed, and where possible, mapped at the bioregional scale. The HCS also presents the conservation and stewardship actions that organizations take to mitigate threats and contribute to the conservation of habitats and species over the course of the next 5-year planning period.

Though it cannot be considered comprehensive, the “Actions” section found within this HCS includes a list by organization, and matrix by habitat, of conservation actions being undertaken and planned for the next 5 years. Resulting gaps in the “Actions” section can be interpreted as opportunities for development of new complementary conservation actions to be undertaken by existing and new groups alike. It should be noted that conservation groups seeking government funding (e.g., HSP, AFSAR, ETF, WTF) to undertake conservation actions within the bioregion are strongly encouraged to use this HCS, making specific reference to relevant gaps and opportunities identified within the “Actions” section. In combination, this HCS and related map products will serve to inform and guide conservation and stewardship actions of organizations within the bioregion.

Goals

The conservation goals that have been identified to guide the development of this HCS are:

- 1) Identify areas that are important for the conservation of priority habitats and species.
- 2) Establish, support, and enhance conservation partnerships to facilitate decision-making and focus collective conservation efforts.
- 3) Maintain healthy, intact, and fully functioning ecosystems by building on existing conservation work by the partnership and informing efforts to acquire land for conservation.
- 4) Support the management of and maintain corridors between existing protected areas and other conservation lands through land securement, partnerships, and community outreach (i.e., stewardship).
- 5) Support the recovery of populations of species at risk through collective conservation actions by the partnership, further informed by federal and provincial resources on species at risk.
- 6) Support the advancement of collaborative ecosystem and species research to inform decision-making and planning.
- 7) Support the advancement of community support and understanding of biodiversity values, and inform local stewardship initiatives.

We hope that you find this HCS useful and encourage your partnership with the Eastern Habitat Joint Venture New Brunswick Steering Committee in habitat conservation endeavours.

A. BIOREGION SCOPE

i. Location and Size

Located on the northeastern coast of New Brunswick, the Acadian Peninsula Bioregion is characterized by productive freshwater and coastal wetlands, peatlands, sandy barrier beaches and extensive forests, all of which support rare species as well as high concentrations of breeding and migrating birds. The Acadian Peninsula Bioregion lies between Chaleur Bay and the Gulf of St. Lawrence and encompasses approximately 416,553 ha (Figure 1). This Bioregion encompasses approximately 6 % of the land area of New Brunswick. This Bioregion is in the Northern Appalachian – Acadian Ecoregion, and considered part of BCR 14 NB and Marine Biological Unit 12, migratory bird spatial planning units (GOC 2013). Land

ownership influences the strategies employed to meet conservation goals and objectives. Within the Acadian Peninsula Bioregion, ownership is split evenly between public and private lands (Table 1). Ownership in coastal areas is primarily private (Figure 1).

II. *Boundary Justification*

The boundaries of the Acadian Peninsula Bioregion were primarily based on provincially delineated watersheds. The bioregion is bounded by and encompasses the Acadian Peninsula Composite level-1 watershed, as well as seven level-3 watersheds that feed into the Miramichi River system. It also encompasses a small salt marsh area west of the City of Bathurst the western boundary of which is delineated by a highway. The inclusion of the seven level-3 watersheds from the Miramichi River system ensures connectivity with the adjacent New Brunswick Northumberland Strait Bioregion to the south, and also captures coastal and forest target occurrences that occur just south of the level-1 Acadian Peninsula Composite watershed. The extension of the boundary near Bathurst, which has been delimited by a highway to encompass the salt marsh, is defined in order to capture local coastal targets within the entire Nepisiguit River estuary.

The bioregion is located almost entirely within the provincially delineated Caraquet and Tabusintac Ecodistricts (Table 2) of the Eastern Lowlands Ecoregion of New Brunswick (Zelazny 2007). This region is within Bird Conservation Region

Table 1. Land ownership in the Acadian Peninsula Bioregion

Acadian Peninsula Bioregion land ownership (source: NBDNR 2013)										
Ownership	Eco-district								Acadian Peninsula Totals	
	2-5 Nicolas Denys		6-1 Tabusintac		6-2 Caraquet		6-3 Red Bank			
	Hectares	%	Hectares	%	Hectares	%	Hectares	%	Hectares	%
Crown										
Provincial	264	7.0%	147,714	65.4	41,371	23.7	704	8.5%	190,053	46.1
Federal	0	0.0%	0	0.0	281	0.2	0	0.0%	281	0.1
First Nation	0	0.0%	2,077	0.9	1,126	0.6	0	0.0%	3,203	0.8
Private									0	
Small Freehold	3,454	91.8%	66,493	29.4	126,232	72.3	7,441	89.6%	203,620	49.4
Industrial Freehold	43	1.1%	9,591	4.2	5,640	3.2	156	1.9%	15,430	3.7
Total	3,761	0.9%	225,875	54.7%	174,650	42.3%	8,301	2.0%	412,587	

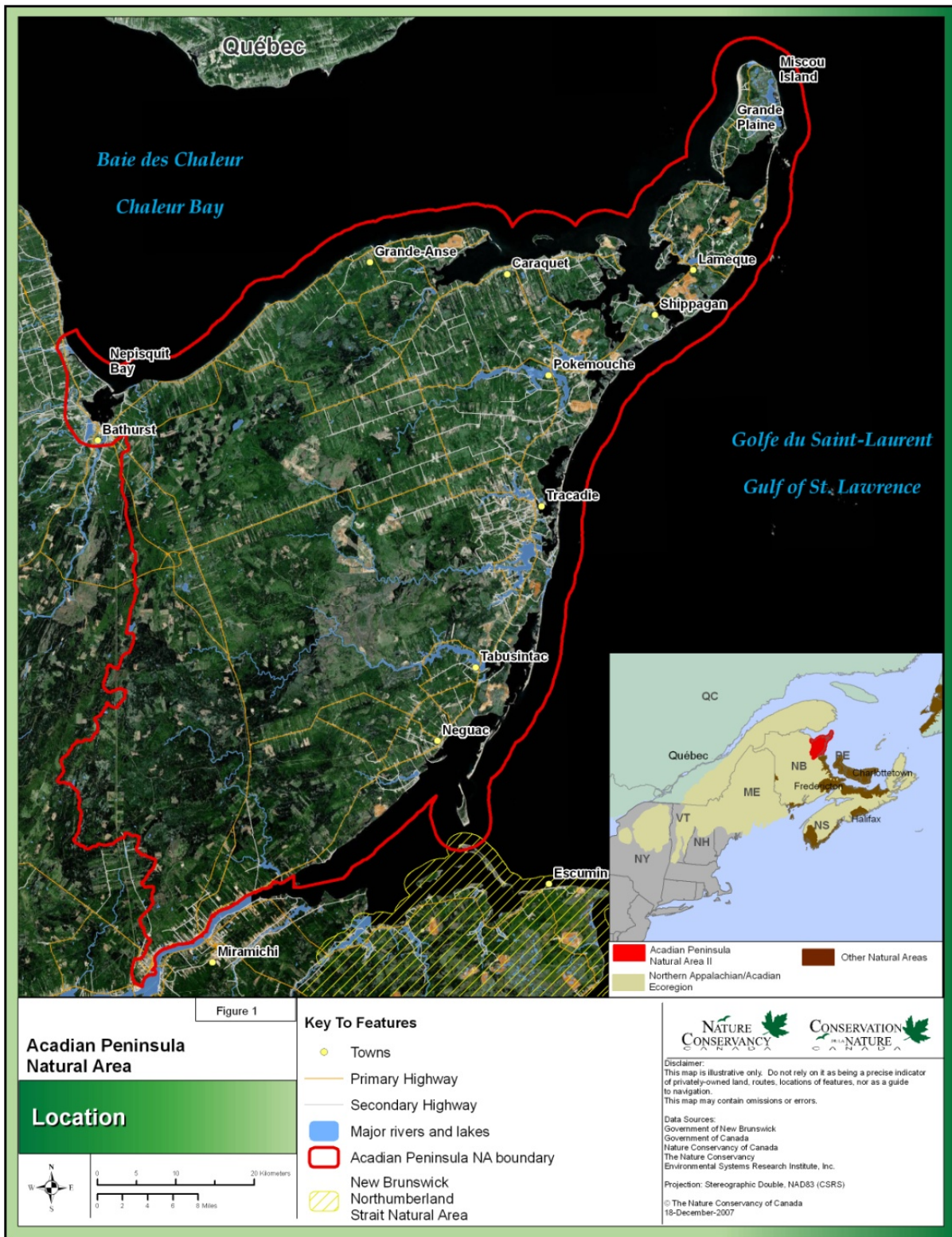


Figure 1. Satellite image of Acadian Peninsula Bioregion showing boundaries of the bioregion, and major population centers.

Table 2. Ecological Land Classification in the Acadian Peninsula Bioregion.

NAAP Subregion ¹	Environment Canada Ecoregion	NB DNR Ecoregion ²	Ecodistrict ²
Northumberland - Bras D'Or Lowlands	Maritime Lowlands	Eastern Lowlands	Caraquet (2) Tabusintac (6)

¹ Anderson et al., 2006

² Zelazny, 2007

From the mouth of the Nepisiguit River, the Caraquet Ecodistrict forms a crescent of land that averages 10 km in width that hugs the Acadian Peninsula coastline and then comes to an end at the mouth of the Miramichi River. Narrowing to a point around Miscou Island, where Chaleur Bay to the north meets the Gulf of St Lawrence to the east, the coastline in this area is made up of an almost continuous chain of sand dunes, sand spits, sheltered bays and salt marshes. The Tabusintac Ecodistrict forms a rough oval shape that is almost entirely surrounded by the Caraquet Ecodistrict.

III. Ecological Significance

The Acadian Peninsula Bioregion contains a number of high priority conservation elements, as was noted in the Northern Appalachian-Acadian Ecoregion Plan (NAAP) by Anderson et al. (2006). In particular, it contains a high concentration and wide diversity of coastal ecosystem types, including beaches, dunes, salt marshes, freshwater wetlands and coastal islands, especially when contrasted with the rest of the Ecoregion. These habitat types along with other ecological systems associated with lower elevations such as riparian/floodplains and freshwater wetlands are deemed to be in greater need of protection within the Northern Appalachian-Acadian Ecoregion. Indeed, there are few examples of these in formally designated protected areas as compared to other ecological system types (Anderson et al. 2006). It is important to note that although this Bioregion only represents 1.2% of the entire Ecoregion in size, a disproportionately high amount of significant habitats occur in the area. In particular, fully 10% of the critical occurrences of beach and dune habitat of the NAA Ecoregion occur within the Acadian Peninsula Bioregion, as derived from NAAP data. The Acadian Peninsula Bioregion encompasses the Gulf of St Lawrence priority area as recognized by the NB Eastern Habitat Joint Venture Program (EHJV) within their NB Coastal Securement Strategy due to its importance to waterfowl (New Brunswick Eastern Habitat Joint Venture 2007).

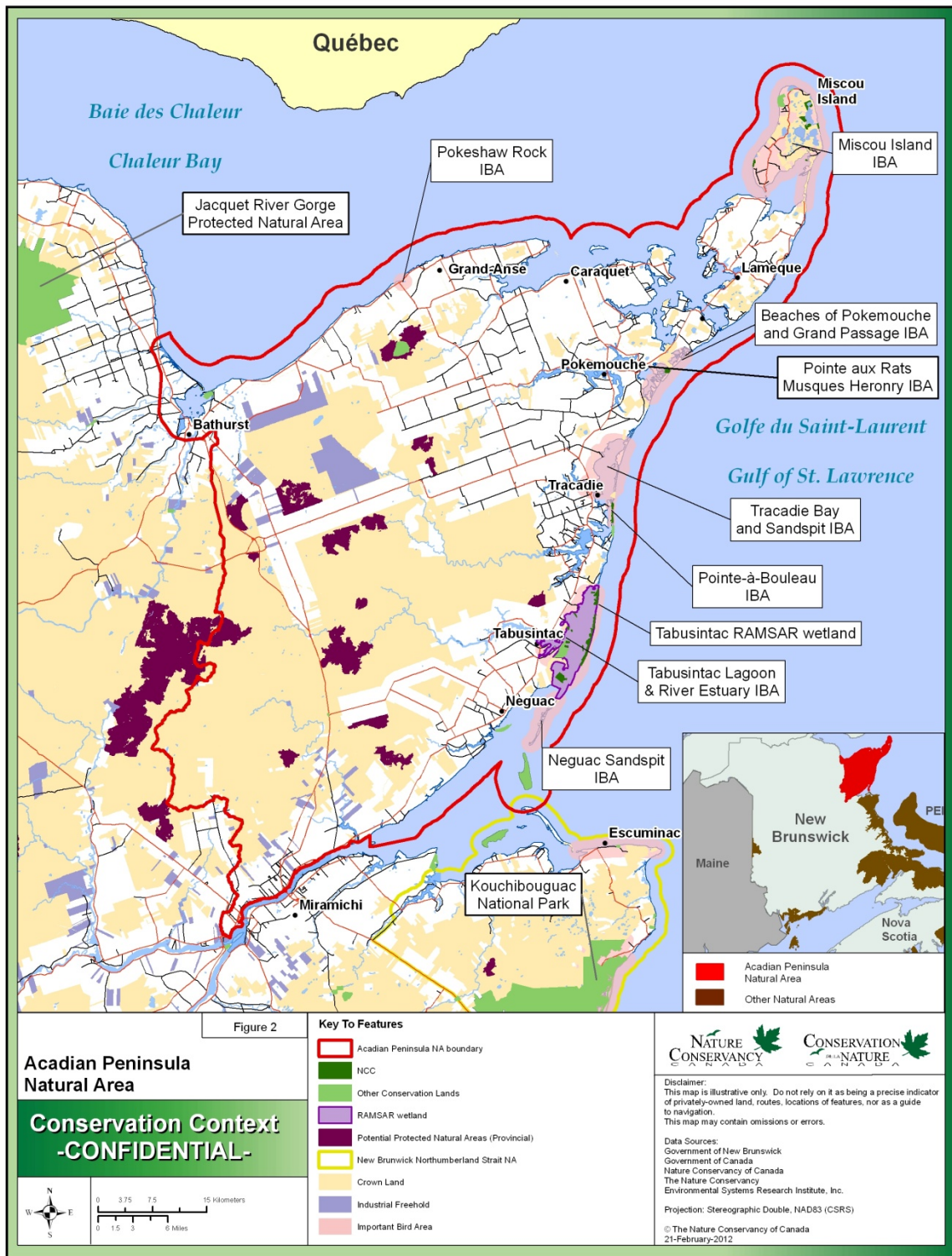


Figure 2. Conservation context for Acadian Peninsula Bioregion.

Biodiversity Composite mapping also corroborates much of the earlier analysis done in the Northern Appalachian-Acadian Ecoregional Plan (NAAP) by Anderson et al. (2006), which states that the Acadian Peninsula Bioregion is an area of notably high biodiversity; this is underlined by its overall biodiversity composite scores.

Forest cover is extensive in this bioregion with approximately 90% of the Tabusintac Ecodistrict and 70% of the Caraquet Ecodistrict under forest cover (Zelazny 2007). There is also a long history of forest harvesting activity with its resultant fragmentation and change of structure of forested habitats in the bioregion. Only 27% of the forest stands are currently classified as “Old Forest” (NB DNR 2009). There are two large intact blocks of forest in the bioregion, as identified through an ecoregional assessment of Forest Matrix Blocks (DeGraff 2011). These are especially significant, as the forests in the Caraquet and Tabusintac Ecodistricts are currently unrepresented in the provincial Protected Natural Areas network. The Government of New Brunswick has recently proposed several sites to be set aside as protected areas in the bioregion. If these were to proceed, the proposed new sites would protect increasingly rare and significant old forest stands.

The coastline along Chaleur Bay consists mainly of sedimentary cliffs interspersed with some small salt marshes and beaches; in contrast, the coastline along the Gulf of Saint Lawrence shore consists mainly of extensive barrier beach / dune island systems with salt marsh surrounding estuarine lagoons (Pronk and Allard 2003). The dune system found along the northeast shoreline of Miscou Island is the widest and one of the best of examples of such systems in eastern Canada (NB Eastern Habitat Joint Venture 2007, Zelazny 2007, Robinson 2010). The Acadian Peninsula has given rise to a variety of habitats that offer refuge to many species at risk (Zelazny 2007). New Brunswick coastlines, including the coastline of the Acadian Peninsula Bioregion, are comprised of dynamic yet very fragile ecosystems that have historically been subjected to significant housing, recreational and infrastructure development pressure with very few restrictions or oversight. In New Brunswick, 65% of salt marshes have been lost during the past 300 years, first as a result of conversion of salt marshes to agricultural lands by building dykes to exclude the tides, then as the result of land “development” (Reed and Smith 1972; Roberts 1993; NB DELG 2002; Hanson et al. 2006).

Due to its geographic setting and its extensive coastal and wetland features, the region is an important area for many species of waterfowl and colonial nesting birds such as gulls, herons and terns, as well as a large diversity of shorebirds including the endangered Piping Plover (*Charadrius melodus melodus*) (Sabine 2002). This bioregion is also the only known area in the province where the endangered Maritime Ringlet (*Coenonympha nipisiquit*) occurs and the threatened Gulf of St. Lawrence Aster (*Symphotrichum laurentianum*) remains extant (COSEWIC 2009, pers. comm. David Mazerolle, March 20, 2014, COSEWIC 2004 b).

Coastal habitats in this Bioregion provide nationally significant bird habitat, as corroborated by the presence of eight Important Bird Areas (IBA) and a Ramsar Site of International Importance in the region (Figure 2, see also Protected Areas and Conservation Lands below for more details). Beyond these formally identified sites, hundreds of kilometers of coastal dunes, extensive barrier beach ponds, expansive peat bogs, and wooded islands that occur in the bioregion provide important habitat for colonial nesting birds, shorebirds and waterfowl, while wetlands and forests of the interior, especially old forest patches, support numerous species of conservation concern (Erskine 1992, Sabine 2002; NB Eastern Habitat Joint Venture 2007, Zelazny 2007, MacKinnon et al 2011).

B. ECOLOGICAL CONTEXT

i. *Ecological Systems and Vegetation Communities*

The Northern Appalachian-Acadian Ecoregional Plan (NAAP) is a comprehensive analysis of the ecology and conservation status of the Northern Appalachian - Acadian Ecoregion. Using ecological, biological, and geophysical data provided by diverse partners, in addition to information gleaned from expert local and regional knowledge, the NAAP summarizes the current state of conservation in the region and provides a framework for further conservation action (Anderson et al. 2006).

The screening criteria for minimum sizes of target habitats for this Habitat Conservation Strategy as identified in the NAAP were: Salt marsh-27 ha, Beach- 9 ha, Dunes- 9 ha, Bog- 33 ha, Freshwater wetlands-22 ha, Tidal flat-45 ha, Forest-11,161 ha. Using these criteria, the coastal ecological systems that were identified as critical by the NAAP in the Acadian Peninsula are beaches/dunes (1,269 ha), bog/fen (4,219 ha), salt marsh/wetland (2,159 ha) and tidal flat (4,184 ha). Two tier-one forest matrix blocks (> 10,000 ha) were also identified in the NAAP in this region. NCC has since refined the GIS analysis that define these large forest habitat blocks for all of New Brunswick in order to identify optimal areas to conserve and restore functional core forest conditions across the various forest types. This creates an all-encompassing and effective approach with which to conserve important habitat and species types in New Brunswick (DeGraff 2011). Two of these large forest blocks, named Carr Barren and Patterson, are located in the Bioregion and cover 11,761 ha and 13,564 ha respectively (See forest target map, Figure 8.).

Coastal Ecosystems

Long contiguous barrier beaches and islands are characteristic of the Acadian Peninsula, especially of the Gulf of St Lawrence coast. These form a nearly continuous sandy strand that stretches from Shippegan to Neguac. These features are the result of low coastal elevations that interact with the effects of alongshore drift and other littoral phenomena (Zelazny 2007). Many of the sandy beaches along the Gulf of St. Lawrence even form barriers at the mouth of bays and estuaries. These allow for the existence of lagoon type environments that are favourable to a large diversity of birds. The Acadian Peninsula has the largest concentration of Piping Plovers in New Brunswick. In fact, beaches and dunes in the bioregion provide breeding habitat for 75% of the province's population of this endangered species (Stewart et al. 2007). Characteristic plant species of these beaches include American Beach Grass (*Ammophila breviligulata*), Sea Lyme Grass (*Elymus mollis*), Seabeach Sandwort (*Honckenya peploides*) and Sea-Rocket (*Cakile edentula*).

Intertidal flat habitats consist of areas that are exposed in the period between absolute high and low tides (Hanson and Calkins 1995). They can be vegetated with various types of seaweed or sea grasses such as Eelgrass (*Zostera marina*). Eelgrass is a keystone species on tidal flats that filters and traps sediment, improves water quality, provides nursery habitats for many species of fish and invertebrates, and helps sustain migratory waterfowl (Hanson 2004b, GOMC 2007, DFO 2009, DFO 2012). Notably, the rich tidal and subtidal flats of Tabusintac Lagoon help make it a wetland of international importance.

Among the most biologically productive ecosystems in the world, coastal salt marshes are a characteristic wetland type of this bioregion. Being largely associated with and sheltered behind lagoons or barrier beaches, the salt marshes of the Acadian Peninsula are predominantly of the high marsh type. As such, they are infrequently flooded by tides (Zelazny 2007). Poorly drained flat areas subject to periodic inundation by salt water, salt marshes are covered with a thick mat of salt tolerant plants which are dominated by *Spartina* grasses. They provide breeding, staging and wintering habitat

for a wide variety of bird species (Hanson 2004a). Also, a large proportion of the nutrients produced in a salt marsh are exported to coastal waters, and provide an important source of food to a variety of commercially important finfish and shell fish. Greater bird species richness and higher densities of Nelson's Sharp-tailed Sparrow (*Ammodramus nelsoni*) are found nesting in the larger salt marshes (Hanson and Shriver 2007). Salt marshes in the Acadian Peninsula have not been impacted as much as marshes along the Northumberland Strait and the Bay of Fundy in New Brunswick have been by residential and commercial development (L. Swanson pers. comm.). As with beaches and dunes, the majority of the critical occurrences of salt marshes in the Acadian Peninsula identified in the bioregion are found mostly along the eastern side of the peninsula.

Coastal islands are a special feature of the Maritime landscape. Very often, their most important attribute as wildlife habitat is their isolation from human disturbance; therefore, the most effective habitat conservation measure is simply to restrict access to them. Many bird species use coastal islands, as they are typically free of mammalian predators and provide excellent habitat for nesting and migrating seabirds, waders and songbirds (NB EHJV 2007). Some coastal islands are especially important for migrating birds because of their geographic location. These islands may be their last land stopover before they undertake an extensive flight over a body of water during migration; conversely, it may be the first land on which to stop after an extended over-water flight. Miscou Island is such an example of an important migratory corridor for birds. Several coastal islands of different sizes are found within this bioregion. Small uninhabited islands include Indian Island, Pokeshaw Island, Caraquet Island, Pokesudie Islet, Munroe Island, Tern Island and Portage Island. Miscou, Lamèque and Pokesudie Islands are attached to the mainland by bridges and have residential development and associated infrastructure. The smaller islands considered in this plan have a similar layout. The smaller islands generally have a sandy perimeter, plant cover consisting of coastal-type flora, and most also have forest cover, depending on the size of the island and depth of soil.

Freshwater Wetlands

The Eastern Lowlands Ecoregion has the highest percentage of wetlands and by far the largest expanse of peatlands in the province (Zelazny 2007). Many of the peat bogs are being commercially mined for horticultural peat. The Acadian Peninsula contains a large number and area of bogs, which are located both along the coast and inland. The raised bogs of the region are an important component of the landscape of New Brunswick, hosting both unique species and communities. For example, sphagnum mosses are characteristic species of bogs, along with other vascular plant species that include ericaceous shrubs such as Leather Leaf (*Chamaedaphne calyculata*), Labrador Tea (*Ledum groenlandicum*), Northern Pitcher Plant (*Sarracenia purpurea*) and Cranberries (*Vaccinium spp.*, Black Crowberry (*Empetrum nigrum*) and Cloudberry (*Rubus chamaemorus*) which are associated with abundant lichen cover are indicator species for bogs of this region (Zelazny 2007). Some provincially rare plants such as Dwarf White Birch (*Betula minor*) and Canada Burnet (*Sanguisorba canadensis*) can be locally common in bogs on the Acadian Peninsula.

Approximately 70% of peatlands in New Brunswick occur on public lands. The province of New Brunswick has been proactive in regulating the exploitation on peatlands through the *Quarriable Substances Act* (Poulin et al. 2004; New Brunswick Department of Natural Resources 2012). Interestingly, apart from being one of the principal peat mining areas in the province, the Acadian Peninsula also has the highest level of peatlands set aside in conservation lands (Poulin et al. 2004). Due to rising sea level and the fact that most of its peatlands are now below mean sea level and thus considered coastal, Miscou Island peat bogs are now recognized as protected by the Ministerial regulation in relation to the rural plan for the unincorporated areas of Lamèque and Miscou Islands

under the Community Planning Act (97-ILM-018-00) (Commission d'aménagement de la Péninsule Acadienne 2012).

In addition to peatlands and associated fens, alder shrub swamps occur alongside streams and rivers in the bioregion. The few lakes in the region tend to have peaty shorelines characterized by ericaceous shrubs.

Aquatic systems

Large rivers within the Bioregion include the Caraquet, Pokemouche, Tracadie, Tabusintac and Bartibog Rivers. They all arise from interior bogs, lakes or springs and flow eastward to the Gulf of St. Lawrence. One smaller river, the Bass River, flows north into Chaleur Bay. Given the low relief of the Bioregion, its rivers flow slowly and tend to meander across the landscape before reaching the coast where they tend to form large lagoon estuaries behind the barrier beaches typical of the area. Striped Bass (*Morone saxatilis*) which is listed as threatened by COSEWIC occurs in several of these rivers. The only breeding population of Striped Bass in Atlantic Canada occurs in the mouth of the Miramichi near Strawberry Marsh (COSEWIC 2004). Atlantic Salmon (*Salmo salar*) also occur in several rivers on the Peninsula, and these Gulf of St. Lawrence populations are COSEWIC assessed as Special Concern. Wood Turtle (*Glyptemys insculpta*), breed along the rivers and several occurrences of this species have been recorded from Bass River. This species was upgraded to Threatened in 2007 federally (COSEWIC, 2007b) and was recently designated as threatened in NB by the new provincial Species at Risk Act (NB SAR Act, SNB 2012 c6, June 3rd 2013). The Bioregion also encompasses a small portion of the mouth of two major New Brunswick rivers, the Miramichi and Nepisiquit. There are few lakes in the bioregion and the lakes that do occur here are small and shallow. Teagues Lake, east of Bathurst, is the largest and contains one of the only Yellow Perch (*Perca flavescens*) populations in northern New Brunswick; this species is more common in southwestern NB.

Forests

The forests found in the Bioregion are part of the Acadian forest. This forest type is only found in the Maritime Provinces and limited parts of northern New England and southern Quebec. Acadian Forest in New Brunswick is a mix of typical northern Boreal conifer-dominated forest blended with those of southern hardwood forest, which creates a remarkably diverse system. Human influence over the past 200 years has simplified the forest structure, composition and age class. Old stand types are far less abundant today than were historically found in this area (Erdle and Sullivan 1998).

In the Acadian Peninsula Bioregion, Black Spruce (*Picea mariana*) stands occur on the widespread areas of poorly drained soils, whereas pure Jack Pine (*Pinus banksiana*) stands commonly occur along the rivers, where soils are sandier (Zelazny 2007). Balsam Fir (*Abies balsamea*), Red Spruce (*Picea rubens*), Eastern Hemlock (*Tsuga canadensis*), and White Spruce (*Picea glauca*), mixed with hardwoods occur on slopes while deciduous forests composed of species such as Red Maple (*Acer rubrum*), Trembling Aspen (*Populus tremuloides*) and White Birch (*Betula papyrifera*) occur on the steeper slopes and ridge tops. Pure tolerant hardwood communities are infrequent but do occur, in which the dominant species are Sugar Maple (*Acer saccharum*), Yellow Birch (*Betula alleghaniensis*) and American Beech (*Fagus grandifolia*) (Zelazny 2007). The long history of settlement near the coast has resulted in these forests being dominated by intolerant hardwoods. Eastern Hemlock was once more widespread on the Acadian Peninsula, but is now reduced to remnant stands. Northern White Cedar, known locally as Eastern White Cedar (*Thuja occidentalis*) and American Larch (*Larix laricina*), commonly occur with Black Spruce in areas of poor drainage, especially near the coast. The understory generally associated with forests in this bioregion are typical of peatlands and boreal-type forests, including species such as Sheep Laurel

(*Kalmia angustifolia*), Speckled Alder (*Alnus incana*), Bunchberry (*Cornus canadensis*) and Wintergreen (Teaberry; *Gaultheria procumbens*) (Zelazny 2007).

Grasslands

Grasslands in the Acadian Peninsula are anthropogenic features where the cultivation and management is related to agricultural practices. Grasslands are used by a variety of species, including high priority birds for conservation and Species at Risk (Environment Canada 2012c). In the Acadian Peninsula, mixed farming occurs in patches along roads and the coast and is dominated by pasture, forage, and grain production, with significant areas of blueberry harvesting (NB EHJV 2007). Because of the poor soils, this area has never been an important area for agriculture. However, commercial blueberry and cranberry production is on the rise.

ii. Dominant Ecological Processes

Located within the provincially delineated Eastern Lowlands Ecoregion, the Acadian Peninsula Bioregion is more specifically outlined by the Tabusintac and Caraquet Ecodistricts. It is bounded by the Chaleur Bay to the north and the Gulf of St. Lawrence to the east. Sloping gently eastward, the average elevation of the Tabusintac Ecodistrict is 98 m while the elevation along the coast in the Caraquet Ecodistrict averages 42 m (Zelazny 2007).

The high elevations of the Northern Upland and Southern Upland Ecoregions to the west of the Acadian Peninsula act as a physical barrier, conferring a tendency towards a drier climate, whereas the Gulf of St. Lawrence has a cooling effect on the area (Zelazny 2007). The climate of the Acadian Peninsula generally fluctuates between a humid maritime and a continental-type climate due to its proximity to the Gulf of St. Lawrence (Entreprise Peninsula 2005). The average summer temperature is 20 °C and slightly warmer (reaching 25-30 °C) inland along river valleys (Entreprise Peninsula 2005). Of note also are the wind speeds along the coast during the summer that can reach as much as double that of more inland areas (Zelazny 2007). In the winter, the humid northeast air from the Gulf of St. Lawrence periodically alters the prevailing winds from the northwest that carry cold air masses from the continent (Entreprise Peninsula 2005).

Coastal systems

Coastal erosion plays a major role in the bioregion. It has been shown that the Canadian Maritimes and especially the Gulf of St. Lawrence coast are vulnerable to sea-level rise and associated erosion and flooding from storm impacts (Webster and Forbes 2005, Daigle 2012;). Studies have shown that sea level has risen 15 m over the past 6,000 years and 0.3 m over the past 100 years. Predictions are that it will rise 1.00 +/- 0.48 m between now and the year 2100 along the Acadian Peninsula coast (Bérubé 2008, Daigle 2012). The coast along Chaleur Bay features mostly crumbling sandstone cliffs up to Grande Anse while the rest of the coastline around Miscou Island and down to Miramichi Bay displays an almost continuous chain of dunes, beaches, protected bays and salt marshes intersected only by estuaries along the major rivers (Zelazny 2007). The rate of erosion along the coast between Miscou Island and Miramichi is the highest in the province, often reaching over one meter per year (Bérubé pers. comm. 2012). The combination of erosive soils and relatively low land elevations has led to predictions that there will be significant impacts associated with sea level rise along much of the Acadian Peninsula coastline. These include flooding, erosion, beach migration, and coastal dune destabilization (Shaw et al., 1998). Interestingly, the dune system in the Grande Plaine area on the west coast of Miscou Island is different than many other dune systems in Atlantic Canada. The dune system

in the Grande Plaine area is not an eroding system, but rather one that is expanding into the sea. It is likely gaining sediment from the rapidly eroding eastern side of the island.

Coastal ecosystems are very dynamic – they are continually changing and evolving. These systems are influenced by tides, salt, sediment structure, currents, wind, temperature, ice cover and scouring. Beaches, particularly the sandy barrier beaches found on the eastern shoreline of the bioregion, along the Gulf of St. Lawrence, and associated dunes, are inherently dynamic systems. Over time, barrier beaches and dune systems can migrate (i.e., shift) at relatively steady rates. Conversely, intense storms can create blowouts and rapidly transform a barrier beach. For example, a single, large island can be transformed into a series of smaller sandy islands (Reinson 1980).

Normal tidal ranges along the Gulf of St. Lawrence coast are 2-4 m with mixed components of semidiurnal and diurnal influences (Hanson 2004a). The duration and frequency of tidal flooding in the coastal zone determines where species occur (Bertness 1999, Olsen et al 2006). Coastal marshes respond to gradual sea level rise by growing vertically and moving inland, provided there is a sufficient sediment supply, a shallow grade, and that human activity on the upland does not prevent inland migration (Redfield 1972). However, with development, anthropogenic ‘coastal squeeze’ occurs as protective infrastructure surrounding residential properties (shoreline hardening) prevents the natural inland migration of coastal systems. This is further complicated by development and infrastructure on coastal headlands and associated erosion prevention efforts, which effectively removes the sediment supply.

Freshwater wetlands

Peatlands (bogs and fens) make up approximately 75 % of all freshwater wetlands in the bioregion. The species groupings found in bogs and fens are very dependent on site hydrology (National Wetlands Working Group 1988). Coastal bog and fen development is favoured by the cool maritime conditions of the Acadian Peninsula Bioregion. The majority of bogs in the Bioregion are ombrotrophic (fed by the precipitation rather than surface or groundwater). In order to adapt to low nutrient levels, some plants such as sundews (*Drosera spp.*) and the Northern Pitcher Plant (*Sarracenia purpurea*) supplement their mineral requirements by trapping insects. The water table in bogs is just below the surface which is usually covered in mosses resulting in spongy, waterlogged ground (Canadian Wetland Classification System 2007). Because the soil conditions at the bottom of a bog are impermeable, they are relatively unaffected by the nutrient-rich groundwaters from the surrounding mineral soils (National Wetlands Working Group 1988). Bogs are acidic environments. Over time, the dominant, well adapted, sphagnum mosses accumulate as peat and contribute to raising the bog. In the absence of water, bogs usually evolve into forested stands as tree species are able to encroach once the water table has been lowered (Whitfield et al. 2006). The surface of a bog is sometimes flat, but may be raised towards the centre. The hydrology is shaped by the water mound and fluctuating water levels in the acrotelm zone (top 50 cm). The ecological viability of a bog is directly dependent on the extent and integrity of the water mound and on peat-forming communities dominated by sphagnum mosses.

Aquatic systems

The major rivers in the bioregion, arising from interior bogs, lakes or springs, include Caraquet, Pokemouche, Tracadie, Tabusintac and Bartibog which flow gently eastward on the undulating landscape to the Gulf of St. Lawrence and Nepisiguit and Bass River that flow towards Chaleur Bay. Aquatic ecosystems can be characterized as freshwater, estuarine or marine and are distinguished by major chemical differences such as salt content. Rich in species, aquatic ecosystems are among the

most complex and diverse on Earth, with myriad interactions involving physical, chemical and biological processes.

Continuously changing shape and size, freshwater streams and rivers shift from narrow, shallow and rapid to broad, deep and slow moving, depending on streambed fall. Substrate varies from rocky to deep sediment and is influenced by the running water. Organisms capable of adhering to an exposed surface are typically found in the upper reaches of a stream, whereas floating and emergent vegetation along with more sessile invertebrates are more likely to be found downstream. A variety of fish species can be found in both environments and their occurrence and persistence is largely dependent upon oxygen levels. Where oxygen levels are higher in the upper reaches of lentic environments, cold water fish such as Atlantic Salmon will more likely be found.

Forests

Forests in this bioregion are typically boreal-like due in part to the influence of fire, as is reflected in the abundance of fire-adapted species such as Trembling Aspen, Jack Pine, Red Pine (*Pinus resinosa*) and Black Spruce, and the combination of high soil acidity and poor drainage (Zelazny 2007). The wet and acidic soil conditions favour conifer tree species; tolerant hardwoods tend to favour well drained upper slopes. Other dominant environmental processes in this Bioregion include slow (stunted) growth of forest ecosystems due to marine exposure and poor soil drainage. The trees along the coastline are often stunted with deformed and damaged crowns, reflecting their repeated exposure to wind and salt spray (Zelazny 2007).

Small, gap-creating disturbances generally covering less than one percent of a given area annually are the dominant natural form of disturbance affecting forest species and age class composition in the Acadian forest (Mosseler et al. 2003), although fire would have traditionally cleared larger areas on sandy soils in this bioregion in the past (Zelazny 2007). An exception to this are the forests near the coast which have a relatively short disturbance cycle (<100 years) with frequent stand-replacing disturbances including blowdown, disease, insects and occasionally fire. These disturbances may occur only once during the life span of the relatively short-lived Balsam Fir, but several times during the life of spruce, hemlock and pine species (Neily et al. 2004).

Outbreaks of Spruce Budworm (*Choristoneura fumiferana*) occur approximately every 30 to 40 years in New Brunswick. This is one of the most destructive native insects of spruce and fir in Canada. An increase in Spruce Budworm is predicted during the next decade. An outbreak may last for several years and cumulative defoliation can cause significant levels of mortality and growth loss in mature softwood forests (Natural Resources Canada 2012). Invasive pests present an emerging threat in the province; Brown Spruce Longhorned Beetle (*Tetropium fuscum*) has been found in Kouchibouguac National Park (Canadian Food Inspection Agency 2012). Asian Longhorned Beetle (*Anoplophora glabripennis*) is not in the province yet but presents a great potential threat.

Through analysis of the historic size range of documented catastrophic disturbance events, along with the area requirements of forest-interior breeding species in the region, Anderson (1999) determined that a 10,000 ha minimum core conservation area in the Acadian Forest would be able to withstand any natural disturbance (hurricanes, fire, ice storms) while maintaining all natural ecological processes (Figure b; Anderson 1999 in Anderson et al. 2006). This size criterion was used by NCC to identify potential core forest reserve areas in New Brunswick.

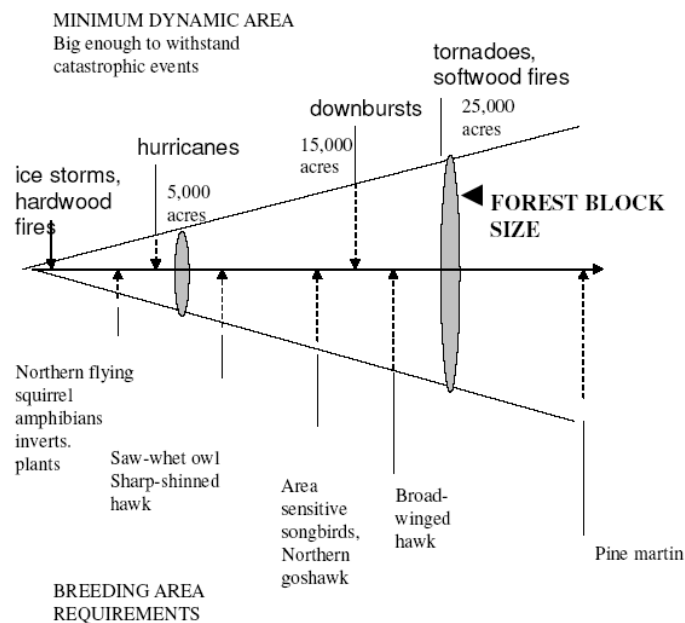


Figure 3. Scaling factors for matrix forming forest in the Northern Appalachian /Acadian ecoregion showing rationale for minimum core protected area (forest block size) - from Anderson et al. 2006.

iii. Species of Conservation Concern

While reference to species found in the bioregion has been made previously in the document, the following is a discussion of particular species deemed significant in the area. The significance arises either because this area is particularly relevant for the species, or because the species is listed or designated as a species of conservation concern. There are three priority species highlighted in the Northern Appalachian Acadian Plan which occur in the bioregion: Piping Plover, Maritime Ringlet and Upland Sandpiper (*Bartramia longicauda*). Nationally (COSEWIC) assessed species found in the area are listed in Table 2 below.

Appendix B provides a list of all priority species for the Acadian Peninsula bioregion. The full list includes all listed species, a subset of element occurrence records (all records of species with a provincial rank of S1 or S2 from 1990 to present) from the Atlantic Canada Conservation Data Centre (ACCDC), all BCR 14 priority bird species that occur in the bioregion, as well as notes on locally important fauna and flora from the Club de Naturalistes de la Péninsule Acadienne. While some species are considered rare provincially and therefore receive a S1 or S2 ranking, the same species may not be rare globally and so may receive a G4 or G5 ranking (for a complete glossary of definitions for Biodiversity and Conservation Ranks, please see Appendix C).

Table 3. COSEWIC Assessed Species in the Acadian Peninsula Bioregion.

Common Name	Scientific Name	COSEWIC Assessment	NB Status
Wood Turtle	<i>Glyptemys insculpta</i>	threatened	threatened
Striped Bass	<i>Morone saxatilis</i>	threatened	special concern (G of St L pop)
Maritime Ringlet	<i>Coenonympha nipisiquit</i>	endangered	endangered
Beach Pinweed	<i>Lechea maritima</i>	special concern	special concern
Gulf of St. Lawrence Aster	<i>Symphyotrichum laurentianum</i>	threatened	endangered
Bathurst Aster	<i>Symphyotrichum subulatum</i> var.2	special concern	endangered
Short-Eared Owl	<i>Asio flammeus</i>	special concern	special concern
Barrow's Goldeneye (Eastern population)	<i>Bucephala islandica</i>	special concern	special concern
Red Knot	<i>Calidris canutus rufa</i>	endangered	endangered
Whip-Poor-Will	<i>Caprimulgus vociferus</i>	threatened	threatened
Chimney Swift	<i>Chaetura pelagica</i>	threatened	threatened
Piping Plover	<i>Charadrius melodus melodus</i>	endangered	endangered
Common Nighthawk	<i>Chordeiles minor</i>	threatened	threatened
Olive-Sided Flycatcher	<i>Contopus cooperi</i>	threatened	threatened
Rusty Blackbird	<i>Euphagus carolinus</i>	special concern	special concern
Bobolink	<i>Dolichonyx oryzivorus</i>	threatened	threatened
Harlequin Duck Eastern pop.	<i>Histrionicus histrionicus</i> pop.1	special concern	endangered
Barn Swallow	<i>Hirundo rustica</i>	threatened	threatened
Eastern Meadowlark	<i>Sturnella magna</i>	threatened	threatened
Canada Warbler	<i>Wilsonia canadensis</i>	threatened	threatened

Table 4. New Brunswick Bird Conservation Region 14 (BCR14) and Marine Biological Unit 12 (MBU12) Priority Bird Species and those relevant to habitat conservation planning in Acadian Peninsula Bioregion (Adapted from GOC 2013).

Priority Species	Group	Population Objective ¹	SARA ²	COSEWIC ³	Provincial Listing ⁴	National/Continental Concern	National/Continental Stewardship	BCR 14-NB	MBU 12-NB	Acadian Peninsula Bioregion Relevance
American Bittern	Waterbird	Increase 100%				√		√		√
American Black Duck	Waterfowl	Maintain current						√	√	√
American Golden-Plover	Shorebird	Assess / Maintain				√		√		
American Redstart	Landbird	Maintain current						√		√
American Three-toed Woodpecker	Landbird	Assess / Maintain						√		
American Woodcock	Shorebird	Increase 50%				√		√		√
Arctic Tern	Waterbird	Assess / Maintain								√
Bald Eagle	Landbird	Maintain current			RE			√		√
Bank Swallow	Landbird	Increase 100%						√		√
Barn Swallow	Landbird	Increase 100%		TH				√		√
Barrow's Goldeneye (Eastern)	Waterfowl	Assess / Maintain	SC	SC				√	√	√
Bay-breasted Warbler	Landbird	Maintain current					√	√		√
Belted Kingfisher	Landbird	Assess / Maintain						√		√
Bicknell's Thrush	Landbird	Increase 50%	TH	TH		√		√		
Black Scoter	Waterfowl	Assess / Maintain							√	
Black Tern	Waterbird	Assess / Maintain						√		
Black-backed Woodpecker	Landbird	Increase 50%						√		√
Black-bellied Plover	Shorebird	Assess / Maintain				√			√	
Black-billed Cuckoo	Landbird	Increase 100%				√		√		√
Blackburnian Warbler	Landbird	Maintain current					√	√		√
Black-legged Kittiwake	Waterbird	Maintain current					√			√

Priority Species	Group	Population Objective ¹	SARA ²	COSEWIC ³	Provincial Listing ⁴	National/Continental Concern	National/Continental Stewardship	BCR 14-NB	MBU 12-NB	Acadian Peninsula Bioregion Relevance
Black-throated Blue Warbler	Landbird	Maintain current						✓		✓
Black-throated Green Warbler	Landbird	Maintain current					✓	✓		✓
Blue-headed Vireo	Landbird	Maintain current					✓	✓		✓
Bobolink	Landbird	Increase 100%		TH		✓		✓		✓
Bonaparte's Gull	Waterbird	Assess / Maintain				✓				
Boreal Chickadee	Landbird	Increase 100%						✓		✓
Canada Goose (North Atlantic)	Waterfowl	Maintain current						✓	✓	✓
Canada Goose (Temperate)	Waterfowl	Decrease						✓	✓	
Canada Warbler	Landbird	Increase 100%	TH	TH		✓	✓	✓		✓
Cape May Warbler	Landbird	Increase 100%						✓		✓
Chimney Swift	Landbird	Increase 100%	TH	TH		✓		✓		✓
Common Eider	Waterfowl	Increase 50%							✓	
Common Goldeneye	Waterfowl	Increase 50% (BCR 14) Assess / Maintain (MBU 12)						✓	✓	✓
Common Loon	Waterbird	Maintain current (BCR 14) Assess / Maintain (MBU 12)				✓		✓	✓	✓
Common Murre	Waterbird	Assess / Maintain				✓				
Common Nighthawk	Landbird	Increase 100%	TH	TH				✓		✓
Common Tern	Waterbird	Assess / Maintain						✓	✓	
Dovekie	Waterbird	Assess / Maintain				✓				
Dunlin	Shorebird	Assess / Maintain				✓			✓	
Eastern Kingbird	Landbird	Increase 50%						✓		✓
Eastern Meadowlark	Landbird	Increase 50%		TH				✓		✓
Eastern Whip-poor-will	Landbird	Assess / Maintain	TH	TH		✓		✓		✓

Priority Species	Group	Population Objective ¹	SARA ²	COSEWIC ³	Provincial Listing ⁴	National/Continental Concern	National/Continental Stewardship	BCR 14-NB	MBU 12-NB	Acadian Peninsula Bioregion Relevance
Eastern Wood-Pewee	Landbird	Increase 100%						√		√
Evening Grosbeak	Landbird	Increase 100%						√		√
Great Cormorant	Waterbird	Assess / Maintain				√				
Great Shearwater	Waterbird	Assess / Maintain				√	√			
Green Heron	Waterbird	Assess / Maintain						√		√
Green-winged Teal	Waterfowl	Increase 50%						√	√	√
Harlequin Duck (Eastern)	Waterfowl	Recovery objective	SC	SC	EN			√	√	√
Horned Grebe	Waterbird	Assess / Maintain	EN ⁷	EN ⁷ SC ⁸					√	
Hudsonian Godwit	Shorebird	Assess / Maintain				√			√	
Killdeer	Shorebird	Increase 100%				√		√		√
Leach's Storm-Petrel	Waterbird	Assess / Maintain				√	√			
Least Bittern	Waterbird	Recovery objective	TH	TH		√		√		
Least Sandpiper ¹⁰	Shorebird	Assess / Maintain				√			√	
Lesser Yellowlegs	Shorebird	Assess / Maintain				√		√	√	
Long-tailed Duck	Waterfowl	Assess / Maintain							√	
Magnolia Warbler	Landbird	Maintain current					√	√		√
Mallard	Waterfowl	Increase 100%						√		√
Manx Shearwater	Waterbird	Assess / Maintain				√				
Nelson's Sparrow	Landbird	Assess / Maintain				√		√		√
Northern Goshawk	Landbird	Increase 50%						√		√
Olive-sided Flycatcher	Landbird	Increase 100%	TH	TH		√		√		√
Peregrine Falcon (anatum)	Landbird	Assess / Maintain	SC	SC	EN			√		
Pied-billed Grebe	Waterbird	Assess / Maintain				√		√		√

Priority Species	Group	Population Objective ¹	SARA ²	COSEWIC ³	Provincial Listing ⁴	National/Continental Concern	National/Continental Stewardship	BCR 14-NB	MBU 12-NB	Acadian Peninsula Bioregion Relevance
Piping Plover (melodus)	Shorebird	Recovery objective	EN	EN	EN	✓		✓	✓	✓
Purple Finch	Landbird	Maintain current						✓		✓
Purple Sandpiper	Shorebird	Assess / Maintain				✓				
Razorbill	Waterbird	Assess / Maintain				✓				
Red Knot (rufa)	Shorebird	Assess / Maintain	EN	EN		✓			✓	✓
Red Phalarope	Shorebird	Assess / Maintain				✓				
Red-necked Grebe	Waterbird	Assess / Maintain				✓			✓	
Red-necked Phalarope	Shorebird	Assess / Maintain				✓				
Red-shouldered Hawk	Landbird	Assess / Maintain						✓		✓
Red-throated Loon	Waterbird	Assess / Maintain				✓			✓	✓
Ring-necked Duck	Waterfowl	Increase 50%						✓		✓
Roseate Tern	Waterbird	Recovery objective	EN	EN						
Rose-breasted Grosbeak	Landbird	Maintain current						✓		✓
Ruffed Grouse	Landbird	Assess / Maintain						✓		✓
Rusty Blackbird	Landbird	Increase 100%	SC	SC				✓		✓
Sanderling	Shorebird	Assess / Maintain				✓			✓	✓
Semipalmated Sandpiper	Shorebird	Assess / Maintain (MBU 12)				✓			✓	
Short-eared Owl	Landbird	Assess / Maintain	SC	SC				✓		✓
Solitary Sandpiper ¹⁰	Shorebird	Assess / Maintain				✓		✓	✓	✓
Sooty Shearwater	Waterbird	Assess / Maintain				✓				
Sora	Waterbird	Assess / Maintain				✓		✓		✓
Spotted Sandpiper	Shorebird	Increase 50%				✓		✓		✓
Surf Scoter	Waterfowl	Assess / Maintain							✓	

Priority Species	Group	Population Objective ¹	SARA ²	COSEWIC ³	Provincial Listing ⁴	National/Continental Concern	National/Continental Stewardship	BCR 14-NB	MBU 12-NB	Acadian Peninsula Bioregion Relevance
Thick-billed Murre	Waterbird	Assess / Maintain				✓				
Tree Swallow	Landbird	Maintain current						✓		✓
Veery	Landbird	Increase 100%						✓		✓
Virginia Rail	Waterbird	Assess / Maintain				✓		✓		✓
Whimbrel	Shorebird	Assess / Maintain				✓		✓	✓	
White-breasted Nuthatch	Landbird	Maintain current						✓		
White-throated Sparrow	Landbird	Maintain current					✓	✓		✓
Willet	Shorebird	Increase 50%				✓			✓	✓
Wilson's Snipe	Shorebird	Increase 100%				✓		✓		✓
Wood Duck	Waterfowl	Increase 50%						✓		✓
Wood Thrush	Landbird	Increase 100%				✓		✓		✓
Yellow Rail	Waterbird	Assess / Maintain	SC	SC		✓		✓		
Yellow-bellied Sapsucker	Landbird	Maintain current					✓	✓		✓

¹ Population objectives apply in all units where the species is priority (BCR 14-NB, MBU 12-NB) unless otherwise indicated.

² Species listed on Schedule 1 under the Species At Risk Act as Endangered (EN), Threatened (TH) or Special Concern (SC) (Species at Risk Public Registry 2012).

³ Species assessed by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC 2012) as Endangered (EN), Threatened (TH) or Special Concern (SC).

⁴ Species listed under New Brunswick's Endangered Species Act as Endangered (EN) or Regionally Endangered (RE) (New Brunswick 2004).

This area is remarkable for its variety of flora and fauna due to its diversity of ecological systems. Coastal ecosystems support a large and diverse invertebrate population (insects, crustaceans, molluscs), which in turn are important as prey for migratory and over-wintering birds. In addition to the presence of highly diverse habitats, the close proximity of these habitats enables many species to take full advantage of the various habitats at different life stages. For example, the forested areas near the coast and a few wooded islands in the bioregion support relatively large colonies of Great Blue Heron (*Ardea herodias*) and in two locations, Black-crowned Night Heron (*Nycticorax nycticorax*) (NB EHJV 2007, MacKinnon et al. 2011,). The close proximity of available food supply in the nearby salt marshes, ponds and estuaries makes it an ideal location for these colonies. Wood Turtles use a variety of habitats including woodland, wetlands and agricultural lands with a preference for riparian areas with diverse and patchy cover (COSEWIC 2007b). They may be significant in this area due to the high quality and quantity of these habitats. The Wood Turtle is endemic to North America. In Canada, it occurs only in Ontario, Quebec, Nova Scotia and New Brunswick, which represents approximately 30% of the global distribution (COSEWIC 2007b. New work is being done in the Bioregion to establish databases and gather information on population, nesting and overwintering location of the Wood Turtle (M. Toner, pers. comm.).

The Upland Sandpiper was identified as a primary target by the NAAP. Although recorded in the bioregion during the First Maritime Breeding Bird Atlas (Erskine 1992), it was not recorded here during the second Maritime Breeding Bird Atlas, nor at any time in the intervening years (I. Austin pers. comm.). The necessary habitat to support this species is still present, and therefore the Upland Sandpiper is not considered a conservation priority for the bioregion for the purposes of this strategy. Habitat requirements for Upland Sandpiper are similar to other significant species, such as the Short-eared Owl, that do occur in the bioregion. The mix of habitats in the bioregion, including peatlands, coastal and inland marshes, beaches and dunes, seems to be favorable to the Short-eared Owl as a significant portion of its provincial population is found in the bioregion (BSC et al. 2012). Other birds significant to the area that also depend on similar grassland type habitats are the Vesper Sparrow (*Pooecetes gramineus*), the Bobolink (*Dolichonyx oryzivorus*) and the Barn Swallow (*Hirundo rustica*). The Vesper Sparrow is scarce in the Maritimes (Erskine 1992). The Bobolink was designated as threatened by COSEWIC in 2010. Over a period of 10 years (1998 to 2008), the Breeding Bird Survey data showed a significant decline of the Canadian Bobolink population of 4.6% per year, which corresponds to a population decline of 38 percent over this period (COSEWIC 2010). The Barn Swallow was designated as threatened by COSEWIC in May 2011. Though the causes for population declines are not well understood, it is thought that they are primarily related to agricultural changes and loss of both artificial nesting sites (e.g. barns) and foraging habitat (COSEWIC 2011a). The population decreases of these species are likely due in part to changes in agricultural practices, land use and grasslands reverting to forest (Erskine 1992, COSEWIC 2010, COSEWIC 2011a).

The forest communities of the bioregion are home to other species of federal significance such as the Olive-sided Flycatcher (*Contopus cooperi*), Chimney Swift (*Chaetura pelagica*) and Canada Warbler (*Wilsonia canadensis*). The Canada Warbler breeds in a variety of forest types, but always in areas with a well-developed shrub layer and frequently in moist to wet sites while the Olive-sided Flycatcher is most often associated with openings or edges in coniferous forest containing tall trees or snags for perching (COSEWIC 2007a, COSEWIC 2007c, COSEWIC 2008) Although presently associated with anthropogenic structures, the Chimney Swift does have a habitat association with large trees of mature and old growth forests (Environment Canada 2012c). All three of these species are also considered in the preliminary list of BCR 14 high priority birds for conservation (Environment Canada 2012c) and are present in the bioregion (Maritime Breeding Bird Atlas – BCR 14 list).

Beaches and Dunes in the Acadian Peninsula support important colonies of Common Tern (*Sterna hirundo*). Small numbers of Arctic Tern (*Sterna paradisaea*) can also be found nesting in the colonies. These habitats in the bioregion are also important sites for migratory shorebirds such as Sanderling (*Calidris alba*), Ruddy Turnstone (*Arenaria interpres*), Semipalmated Sandpiper (*Calidris pusilla*), Semipalmated Plover (*Charadrius semipalmatus*) and also Red Knot (*Calidris canutus*). While the Acadian Peninsula does not have particularly high concentrations of migratory shorebirds as compared to the Bay of Fundy, it does host a remarkable diversity of species, some rare, spread over the coastal area along the many sand bars and barrier beaches (L. Richardson pers. comm.). The Maisonette Dune, in Caraquet Bay, and Malbaie Nord and Malbaie Sud on Miscou Island, are recognized as important areas for shorebirds (Maritime Shorebird Survey Report 2012) including Red Knot and Hudsonian Godwits.

The Acadian Peninsula has the largest concentration of Piping Plovers in New Brunswick and provides breeding habitat for 75% of the province's population of this species (Stewart et al. 2007). During the International Piping Plover census of 2006, the North American population consisted of 3,323 adults, of which 460 (14%) were located in Canada (Goosen and Amirault-Langlais 2009 in Environment Canada 2012a). The New Brunswick population of breeding Piping Plover represented 2.1% of the international population in the 2006 census (Elliott et al. 2009). The next International Census in 2011 indicated that the numbers for the eastern Canada population were the lowest since the survey started in 1991, a decrease of 12% since 2006 (J. Rock pers. comm.). It is worth noting that the productivity of Piping Plover has been consistently high on the Tabusintac dunes since NCC acquired the majority of dune properties, had the squatter shacks removed, and initiated regular monitoring. The recovery of the Piping Plover in Atlantic Canada is regionally tied to the ecological integrity of coastal ecosystems and amount of human disturbance, including ATV use.

The Acadian Peninsula also has one known nesting colony of Black-legged Kittiwakes (*Rissa tridactyla*) located on rocky cliffs near Pokeshaw Island (L. Richardson pers. comm.). This pelagic gull species is not common in the Acadian Peninsula and the colony is one of a very few in New Brunswick, with other colonies located in the southern portion of NB near Grand Manan).

There are a number of provincially and nationally rare plant species that occur in the coastal habitats of this bioregion. The Gulf of St. Lawrence Aster is endemic to the Gulf of St. Lawrence region and Bathurst Aster (*Symphyotrichum subulatum* var.2) is endemic to New Brunswick. These small annual asters are subject to anthropogenic disturbances such as recreational activities and losses of habitat due to development activities (NBDNR 2007). The Bathurst Aster only occurs in the northeastern region of the province, with only several thousand individuals in approximately nine sites (NatureServe 2011). Two of the four known, extant sites in the province for the Gulf of St. Lawrence Aster are in the bioregion, at Miscou Island and Val-Comeau (NBDNR 2007).

Coastal raised bogs are an important component of the landscape of New Brunswick, having unique species and communities (Zelazny 2007). While they are dominated by sphagnum species, a number of provincially uncommon orchids are also found in this environment, such as Swamp-pink (*Arethusa bulbosa*), Tuberose Grass-pink (*Calopogon tuberosus*), and Rose Pogonia (*Pogonia ophioglossoides*). Berry producing plants such as Blueberry (*Vaccinium* spp.) and Cloudberry are also found, providing food for large numbers of Whimbrels (*Numenius phaeopus*) during their southward migration. Though not yet observed in the Acadian Peninsula, the Southern Twayblade (*Listera australis*), a rare orchid considered endangered in New Brunswick (S2), may occur in the bogs in the bioregion where there is suitable habitat (M. Toner pers. comm.).

Identified through the NAAP conservation blueprint process and endemic to the Bay of Chaleur and Gulf of St Lawrence region in New Brunswick and Quebec, the Maritime Ringlet (*Coenonympha nipisiquit*) is a small butterfly that is entirely limited to salt marshes. It is found in only six salt marshes on the Chaleur Bay in New Brunswick and the Gaspé Peninsula of Québec in a combined area of only 350 ha, the total population in the province is estimated at 15,000 (New Brunswick Maritime Ringlet Recovery Team 2005). Four of these sites occur within a 10 km radius of Bathurst Harbour and the two others are introduced populations approximately 45 km from the Harbour, in Bas Caraquet and the Acadian Village Historic site land in Caraquet. A complete survey of potential habitat in northern New Brunswick is required for a conclusive assessment of the species' distribution in the province (New Brunswick Maritime Ringlet Recovery Team 2005). Only five of Canada's three hundred butterfly species are endemic. It is worth noting that the region's rich salt marshes are also home to two more of Canada's five endemic butterfly species. These are the Salt Marsh Copper (*Lycaena dospassosi*) and the Short-tailed Swallowtail (*Papilio brevicauda bretonensis*). Both of these species are globally rare, with rankings of G2G3 and G3G4 respectively. This further underlines the particular importance of these salt marshes to biodiversity. Canada's other two endemic species are found in the western Canadian Arctic (Hall, 2009).

iv. Protected Areas, Conservation Lands, Designations

The Acadian Peninsula includes lands conserved by a number of partners and is a priority area for the New Brunswick Eastern Habitat Joint Venture. Since 1993, NCC has secured a total of 671 ha in the Acadian Peninsula: 92 ha of land on Miscou Island, 32 ha in Pokemouche (Inkerman), 38 ha in Pointe-à-Bouveau, 428 ha in Tabusintac and 81 ha in Neguac. NCC has developed a relationship with conservation groups within the communities to effectively manage NCC owned land and has hosted several events to raise community awareness of the conservation values of the area. Additional land for conservation is held by Ducks Unlimited Canada in Miscou and Bathurst totalling 77 ha.

The Portage Island National Wildlife Area is a 551 ha island in Miramichi Bay that is administered by Environment Canada in accordance with the Canada Wildlife Act. The Inkerman Migratory Bird Sanctuary (16 ha) in Pokemouche Bay is also located in this region and administered in accordance to the Migratory Bird Convention Act. Although the land within the migratory bird sanctuary is under private ownership, Environment Canada's Canadian Wildlife Service has an agreement with the landowner to protect this important habitat. The Inkerman Bird Sanctuary supports important colonies of Black-crowned Night Herons and Great Blue Herons (C. MacKinnon pers. comm.).

There are three provincial parks in the Acadian Peninsula Bioregion: Val Comeau, Hay Island, and Pokeshaw. Pokeshaw Rock is inaccessible since it is a sea stack with rock cliffs measuring approximately 16 m. The adjacent beach on the mainland is managed as a provincial park, which may increase disturbance to the area. Some conservation is also offered to the 996 ha of land surrounding the Village Historique Acadien located next to Caraquet. This historic park's setting, surrounding the Rivière du Nord river, features large expanses of salt marsh in which one of the only two known NB populations of Maritime Ringlet is present (New Brunswick Maritime Ringlet Recovery Team 2005).

There are presently three Class II Protected Natural Areas (PNA) that total 541 ha in the Bioregion: Tabusintac (108 ha), Miscou Grande Plaine (123 ha) and Goose Lake (310 ha). The Tabusintac PNA is located in the community of Tabusintac and features salt marshes, peat bog, which are typical of this coastal area, and an open Black Spruce-Jack Pine forest that provides nesting for Osprey (*Pandion haliaetus*) and Great Blue Herons (NB DNR 2012). The Miscou Grande Plaine PNA is located on the northwestern tip of Miscou Island and features a unique dune system, with more than 30 parallel dunes. First noted in 1905 by W.F. Ganong, a New Brunswick naturalist, a definite transition is visible from open

grass dunes to dunes that are covered with forest, interspersed with hollows that show a different plant composition. Goose Lake PNA presently consists of a bog area that surrounds Goose Lake, just south of Pokeshaw. The province has identified an additional 12,000 ha of candidate PNAs within the Bioregion. One of these proposed sites would triple the size of the Goose Lake PNA. The Goose Lake PNA is within Carr Barren one of the two forest cores identified by NCC.

In addition to existing and candidate PNAs, the NBDNR has identified another 17,000 ha of forest in this bioregion to meet its Crown land stewardship goals for forest biodiversity (more detail is provided in sections 2 and 3). Much of this forest is eligible for timber harvest using partial harvesting treatments.

In total the partners of the Eastern Habitat Joint Venture have secured 1,740 ha of conserved lands in the Acadian Peninsula Bioregion (Table 4), which represents 0.42% of the total land area.

Table 5. Conservation land in the Acadian Peninsula Bioregion.

Landowner Totals and Site Names	Size (ha)
Nature Conservancy of Canada	671
Miscou Island	92
Pokemouche (Inkerman)	32
Pointe-a-Bouleau	38
Tabusintac	428
Neguac	81
Government of New Brunswick Protected Natural Areas	541
Tabusintac	108
Miscou Grande Plaine	123
Goose Lake	310
Government of New Brunswick Conservation Lands	196
Tabusintac	
Government of Canada Protected Areas	451
Portage Island National Wildlife Area	
Ducks Unlimited Canada	77
Bathurst	
Miscou	
Total conservation lands in Acadian Peninsula Bioregion	1,740

Table 6. Important Bird Areas in the Acadian Peninsula Bioregion.

	IBA name	IBA criteria	Latitude/ Longitude	Elevation (m)	Size (km ²)
NB005	Pokeshaw Rock – Caraquet, New Brunswick	Continentially Significant: <i>Congregatory Species</i> (Double-crested Cormorants)	47.78° N / 65.25° W	0-16	0.01
NB021	Miscou Island – Miscou Island, NB	Continentially Significant: <i>Congregatory Species</i> (American Black Duck, Northern Gannet, Surf Scoter) Nationally Significant: <i>Threatened Species</i> (Piping Plover)	47.97° N / 64.8° W	0-10	75.0
NB006	Beaches of Pokemouche and Grand Passage – Inkerman, NB	Nationally Significant: <i>Threatened Species</i> (Piping Plover)	47.65° N / 64.78° W	0-5	8.8
NB027	Pointe aux Rats Musques Heronry Inkerman, NB	Nationally Significant: <i>Congregatory Species, Wading Bird Concentrations</i> (Black-crowed Night Heron)	47.68° N / 64.82° W	0-5	0.15
NB014	Tracadie Bay and Sandspit – Tracadie, NB	Nationally Significant: <i>Threatened Species</i> (Piping Plover)	47.53° N / 64.87° W	0-5	23.0
NB028	Pointe-à-Bouleau – Tracadie, NB	Nationally Significant: <i>Threatened Species</i> (Piping Plover)	47.5° N / 64.97° W	0-5	3.0
NB002	Tabusintac Lagoon & River Estuary – Tabusintac, NB	Globally Significant: <i>Congregatory Species</i> (Common Tern) Nationally Significant: <i>Threatened Species</i> (Piping Plover)	47.35° N / 64.93° W	0-8	43.8
NB015	Neguac Sandspit – Miramichi Bay, NB	Nationally Significant: <i>Threatened Species</i> (Piping Plover)	47.23° N / 65.02° W	0-5	1.4

*source: Canadian Nature Federation. Important Bird Areas of Canada. 2004

The Tabusintac Lagoon is recognized internationally for its significance to waterfowl and shorebird populations. The Tabusintac Lagoon and River Estuary, has been designated as a Wetland of International Importance under the Ramsar Convention. It encompasses 4,382 ha (Environment Canada 1994 and 2003) and is located at the mouth of the Tabusintac River. It is renowned for the high levels of waterfowl use during spring and fall migration periods and is important habitat for thousands of geese and shorebirds (Bird Studies Canada 2012). As such, hunting regulations apply for the areas of the Tabusintac lagoon. The Government of New Brunswick, through the NB EHJV, also owns an additional 196 ha in the Tabusintac area. Also recognized as an Important Bird Area (IBA), it is one of eight IBAs located within the Acadian Peninsula Bioregion (Table 6). Though important in promoting stewardship, these designations confer no additional legal protection as conserved wildlife habitat.

C. SOCIAL AND ECONOMIC CONTEXT

Situated in the north-eastern portion of NB, this Bioregion contains a large portion of Gloucester County and a small portion of Northumberland County. The name Acadian Peninsula derives from the fact that a large portion of Acadians settled and still live there. This region has long been recognized for its importance to wildlife, which is evident by the place names. For example, the name “Pokemouche”, a small community situated along the coast between Shippagan and Tracadie-Shelia, means “bird sanctuary” in the Mi’kmaq language (Enterprise Peninsula 2005). For thousands of years, the Mi’kmaq have fished and hunted from settlements at the mouths of the Pokemouche, Tracadie and Tabusintac Rivers. Today the Mi’kmaq First Nation of Burnt Church is located within the Bioregion. Burnt Church, also known as Esgenoôpetitj, is located approximately 7 km southwest of the village of Neguac, and has a population of just over 1,500 members residing both on and off reserve.

Around 1725, a permanent French settlement was formed at Caraquet where Acadians also later settled following the deportation of 1755 (NB EHJV 2007). During the early colonization period of this area (1750 to 1900) many tidal marshes were dyked and converted to hay land. Today most of these dyked lands have reverted to tidal marsh, and in many instances the remains of the old dykes are no longer even visible. Today the major towns and communities on the Acadian Peninsula include: Bathurst, Caraquet, Lamèque, Shippagan, Paquetville, Saint-Isidore, Tracadie-Shelia, Tabusintac and Neguac. The population base of the Acadian Peninsula is approximately 56,180 or 7.5% of the province’s population (Le forum des maires de la Péninsule Acadienne 2007). The latest census figures show New Brunswick's population grew 2.9% between 2006 and 2011, but northern New Brunswick communities declined during this time period. Bathurst, the largest town in the Bioregion, lost 3.5% of its population during this period (Statistics Canada 2012).

The economy of the Acadian Peninsula has depended almost exclusively on natural resources and seasonal industries. Fishing has been the main activity, although horticultural peat moss has been an important industry in recent decades (Foulem 2000). The area of peatlands on the Acadian Peninsula considered economically viable for peat harvest has almost been exhausted (J. Thibault pers. comm.). However, the threshold peat depth for harvest sites to be considered viable could decrease in future as the availability of peat decreases. Mixed farming occurs in patches along the coast and inland roads and is dominated by pasture, forage, and grain production, with significant areas of blueberry harvesting (NB EHJV 2007). The Miramichi and Nipisiquit River’s shorelines have been occupied by sawmills, logging operations, pulp and paper mills and mines for more than a century. Traditional uses of the beach habitat include hunting, fishing and for recreational purposes in summer months. While traditional uses and industries remain important, the emphasis in coastal areas of New Brunswick has shifted towards recreational development over the past 40 years (Carter 1988). Beaches in the province are increasingly being promoted as tourist destination sites at local, provincial and national levels to attract visitors and enhance the economy.

Statistics Canada data from 2006 for Gloucester County indicate that people working in agriculture and other resource-based industries represent 13% of the labour force, while people working in manufacturing, retail and health care comprise 38% of the labour force (Statistics Canada 2007). Higher rates of unemployment in the north, relative to the rest of the province (12.3% vs. a provincial average of 10% in 2006), has resulted in the continued outmigration of the population (Statistics Canada 2007). However, there is an increasing demand for waterfront properties, as both primary and secondary residential sites as many residents who leave the Acadian Peninsula wish to return during the summers or for retirement. Given that 90% of New Brunswick’s inhabitants live within 100 km of the coast and 60% within 50 km of the shore (New Brunswick Department of the Environment and Local Government,

2002), coastal environment is important to the New Brunswick economy, as well as for cultural and recreational activities (Bérubé and Thibault 1998).

2. Habitat Conservation Priorities

A. HABITAT TYPES

The process to identify which habitat types were a conservation priority in this Acadian Peninsula Bioregion plan was similar to that used in the Acadian Peninsula Natural Areas Plan (NCC 2006). It was a process based on a thorough research of literature, speaking with experts and iterative review with partners to identify which ecological communities were host to the largest number and diversity of species of conservation concern. Habitat conservation priorities for the Acadian Peninsula Bioregion were similar to those identified in the NB EHJV Coastal Land Securement Strategy (Sabine 2002), the Acadian Natural Areas Protection Plan (NCC 2005), and the New Brunswick Dept. of Natural Resources priorities for old forest communities and habitats (NB DNR 2011). It should be noted that habitat types (ecological communities) are characterized at a relatively coarse level so they include a number of species of conservation concern and are consistent with available mapping and habitat association data.

Threats to habitats were based on expert knowledge of EHJV member organizations, literature review including BCR plans, and interactions with local communities and landowners.

Habitat conservation priorities for the Acadian Peninsula Bioregion Habitat Conservation Strategy 2013 include the following six broad habitat types:

1. Beach/Dune
2. Salt marsh
3. Coastal Islands
4. Freshwater Wetlands
5. Forest Mosaic
6. Grasslands

All significant species of conservation priority are found in one or more of the habitat type conservation priorities. The full list of conservation priority species occurring within the habitat types is provided in Appendix B.

The spatial location of the priority habitat types are mapped in Figures 3 – 8. One of the limitations in the mapping was that data were not available for industrial freehold parcels due to data-sharing restrictions. This is not such a significant gap in the Acadian Peninsula Bioregion because industrial freehold only represents ≈ 4% of the land ownership.

For each habitat conservation priority, a detailed status assessment was made of its size, condition and landscape context (Low 2003) using background target information collected from the bioregion, a review of literature and expert opinion. The status of the habitat priorities can be classified as ‘poor’, ‘fair’, ‘good’ or ‘very good’ (adapted from The Nature Conservancy).

The current overall habitat status for the Acadian Peninsula Bioregion is good (Table 5). Salt Marsh habitat received a ‘very good’ status, meaning that although it is an important habitat type, salt marshes in the bioregion are currently functioning at an ecologically desirable status, are little impacted by anthropogenic impacts and require few additional conservation actions. Beaches & Dunes, Freshwater Wetlands and Coastal Islands were determined to have a ‘good’ status, meaning they are within an

acceptable range of ecological variation, although they may require some human conservation and management activities to maintain ecological functions. Forest Mosaic and Grasslands received a status assessment of 'fair', meaning they are at or below the desired ecological threshold, but with conservation and management actions can reach desired levels of ecological integrity and functions.

Priority Habitat: Beaches & Dunes

Target Definition Beaches and Dunes: Beaches are defined in the NAAP as: "thick accumulations of unconsolidated water-borne, well-sorted sand and pebbles deposited onshore, or in active transit along it" and dunes are defined as: "transient mounds of loose, windblown sand, sometimes stabilized with vegetation" (Anderson et al. 2006). Beaches and dunes although ecologically similar and spatially linked, they are distinct in that they are affected differently by frequency and duration of salt water inundation and have differences in associated vegetation (Anderson et al. 2006). The majority of occurrences occur on the Gulf of St. Lawrence side of the Acadian Peninsula with some occurrences on the Chaleur Bay side (Pronk and Allard, 2003). Critical occurrences of beaches/dunes identified in NAAP: size = Beach > 8.1 ha; Tidal flat > 40.5 ha (Anderson et al. 2006); these are mapped in Figure 4.

Ecological Justification Beaches and Dunes:

Beaches and Dunes are ecologically significant ecosystems as they support a high number of rare and at risk and endemic species (Robinson 2010, New Brunswick Department of the Environment and Local Government 2002). The east facing shores that offer extensive sandy beaches and dunes (Anderson et al. 2006) in this bioregion are some of the best examples of these habitats in Canada and potentially North America (Robinson 2010). As the beaches of the Acadian Peninsula are important resting and breeding sites for a variety of migratory shorebirds, the conservation of these habitats will substantially contribute to the conservation of a variety of shorebirds birds of conservation priority (Table 4) including the federally listed Piping Plover and Red Knot. Gulf of St. Lawrence Aster and Bathurst Aster are rare plant species that are present in these habitats and will also benefit from their conservation. Other priority species for this habitat type are listed in Appendix B.

The intertidal areas adjacent to beaches and dunes can be the foraging sites for many species of birds; therefore, they are also very important habitat. Such important intertidal areas will be protected through the stewardship activities developed for beaches and dunes, controlling access to intertidal areas through acquisition of beach and dune habitat, and/or establishment of Protected Natural Area.

Landscape Context Assessment Beaches and Dunes: Very Good

The average Landscape Context Index¹ (LCI) for beaches and dunes in the Acadian Peninsula is 20 which is considered very good (calculated from NAAP data). New Brunswick has a Coastal Areas Protection Policy which regulates development in or around coastal habitats. There is an increasing rate of development along the coast, but much of this coast remains undeveloped, as such, much of the surrounding land is in a natural land cover. The potential for coastal erosion is moderate to high in this bioregion (Shaw et al., 1998) however, as development surrounding this target is somewhat limited, these habitats are able to migrate in an unhindered manner.

¹ Landscape Context Index (LCI): measure refers to relative amount of development, agriculture, quarries, roads and other fragmented features within directly surrounding ecosystem occurrence. It provides an estimate of isolation of occurrence as well as future encroachment on the occurrence. To assess landscape context, an LCI based on these features within a km radiance surrounding occurrence was developed (source: Anderson et al. 2006)

Condition Assessment Beaches and Dunes: Fair

Localized threats to this habitat exist and are increasing, as is the case in other coastal areas in the province. Beaches and sand dune ecosystems are very heavily impacted by human activities such as use of ATVs and other recreational activities, as well as coastal development (Robinson 2010). ATVs are particularly damaging to dune systems because they kill off vegetation and can disturb nesting Piping Plover and destroy nests (L. Richardson pers. comm.). These vehicles can even damage the fundamental structure of the beaches and dunes (D. Berube pers. comm.). The Beach/Dune habitat in the Acadian Peninsula Bioregion supports 75% of the breeding population of Piping Plovers in New Brunswick (Stewart et al. 2007). The Eastern Canadian Piping Plover population (209 pairs in 2011) is below the short term population objective of 255 pairs, and significant change must occur to meet the long term population objective of 310 pairs (J. Rock pers. comm.).

In this bioregion, some of the beaches are impacted by buildings erected by squatters (i.e., not the landowner). The vegetation is disturbed or destroyed in the area surrounding these buildings and in some cases further afield, such as along trails created haphazardly around these structures, thus allowing for an increased potential for wind and wave induced erosion (pers. obs.) and therefore loss of habitat for the species they support.

There is little information on the impact of invasive species on beaches and dunes in the bioregion; however, large patches of Sowthistle (*Sonchus arvensis*) have been observed in some areas that would otherwise be covered by American Beachgrass (*Ammophila breviligulata*) (pers. obs. 2011).

Size Assessment Beaches and Dunes: Good

Stretching from Chaleur Bay around to the Gulf of St. Lawrence and down to the mouth of the Bay of Fundy, there are approximately 5,501 km of coastline in New Brunswick, which also represents 87% of the total provincial boundary (New Brunswick Department of the Environment and Local Government 2002). Based on the GIS inventory, the Bioregion contains 1,176 km of coastline or 21% of the provincial total. The Acadian Peninsula Bioregion contains 9% of all the beaches and dune systems of the entire Ecoregion. According to the NAAP, 78% of beaches in the bioregion are of critical importance. Some off-shore dune/beach/sandbar systems located in the Acadian Peninsula Bioregion are very exposed and have undergone severe erosion in recent years. Loss of elevation has been particularly significant. While the area of sand dunes may not appear to be greatly reduced, the volume of sand / height of dune systems are rapidly diminishing (R. Capozzi, pers. comm.).

Overall Assessment Beaches and Dunes: Good

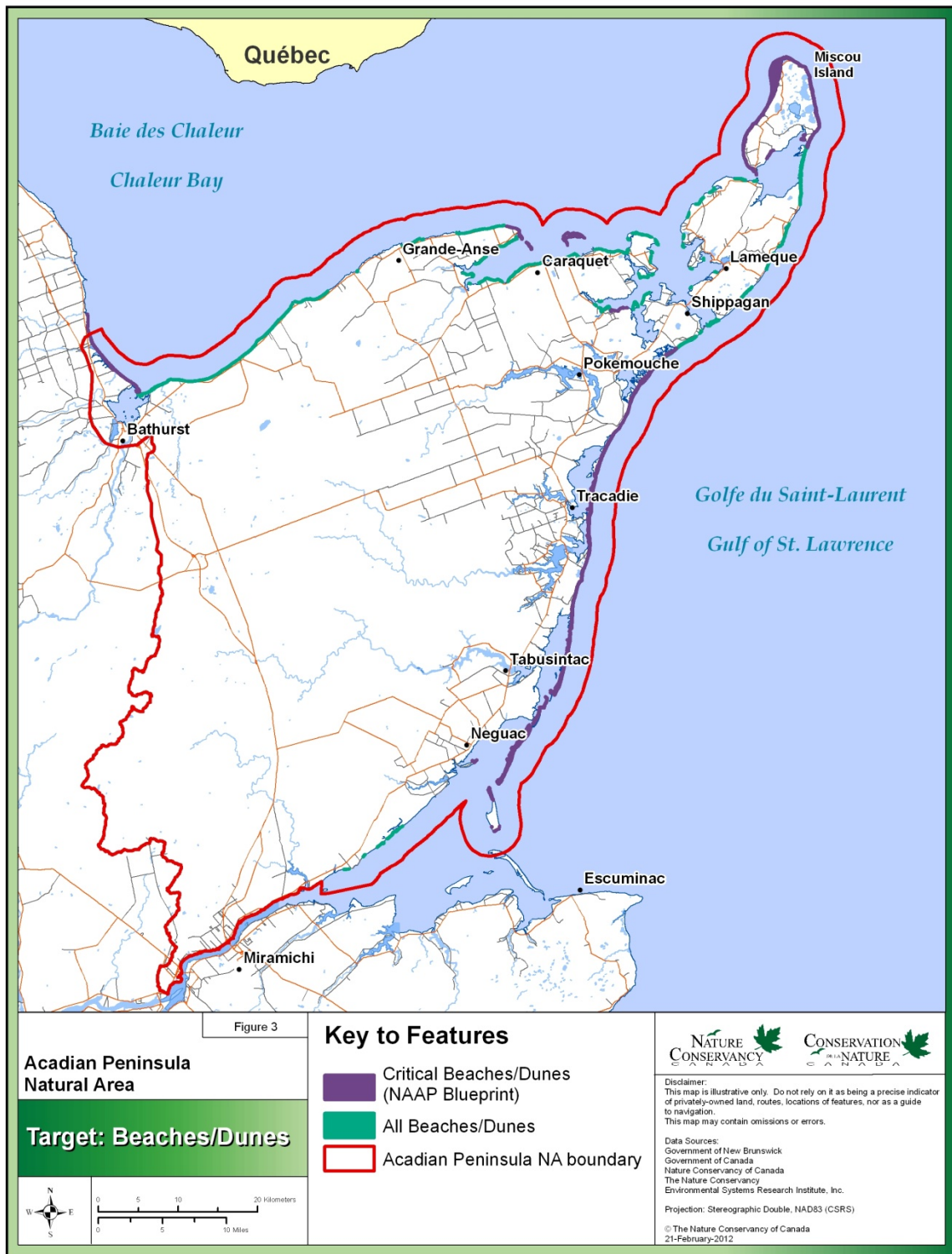


Figure 4. Location of Beaches and Dunes within Acadian Peninsula Bioregion.

Priority Habitat: Salt Marshes

Definition Salt Marshes:

Salt marshes are flat, poorly drained areas subject to periodic inundation by salt water. Salt marshes are covered with a thick mat of salt tolerant plants, dominated by *Spartina* grasses. Critical occurrences of salt marshes identified in NAAP: size = salt marsh > 24.28 ha or part of a complex over 40 ha (Anderson et al. 2006). All salt marshes, including critical occurrences from the NAAP (size = > 24.28ha; Anderson et al. 2006) are mapped in Figure 5.

Ecological Justification Salt Marshes:

Salt marshes are among the most productive ecosystems along the coast and are one of the most important habitats for biodiversity in this region (Anderson et al. 2006). Within the bioregion, the rich abundance of salt marshes offers a refuge to several species of rare or endangered birds, plants and butterflies (Zelazny 2007). The conservation of this habitat in the Acadian Peninsula will contribute to the conservation of migratory and breeding waterfowl, seabird colonies, and a number of other bird species considered a priority in BCR 14, including but not limited to Nelson's Sparrow and Willet (*Catoptrophorus semipalmatus*), as well as Maritime Ringlet which only occurs at a few sites along the northwestern boundary of the bioregion. Other significant species for this habitat type are listed in Appendix B.

Landscape Context Assessment Salt Marshes: Very Good

The average landscape conservation index (LCI) for salt marshes in the Bioregion is 20, which is considered very good (calculated from NAAP data). Sediment supply is limited in the Gulf of St. Lawrence as compared to the Bay of Fundy, which limits the rate of natural vertical migration of salt marshes. Despite this, data on salt marsh accretion rates in a salt marsh at Tabusintac Bay indicates sediment deficit is not currently a concern on this coast (Chmura 2001).

Condition Assessment Salt Marshes: Very Good

Generally, salt marshes in the Bioregion are in good to excellent condition. To date, there have been no reports of invasive species that have impacted marshes in Gulf of St. Lawrence, although *Phragmites* spp. is present along the periphery of many salt marshes (Hanson 2004b). There are three endemic species associated with salt marshes in the Acadian Peninsula: the Gulf of St. Lawrence Aster, the Bathurst Aster and Maritime Ringlet butterfly. The Gulf of St. Lawrence Aster population has been declining both in NB and in the bioregion (Environment Canada 2012b). As for Maritime Ringlet, the data are not presently available to accurately assess the viability of the population in the bioregion (Eaton pers. comm.). There is an increasing rate of development in coastal areas in New Brunswick, but much of the coast on the Acadian Peninsula is still undeveloped. New Brunswick's Wetlands Protection Policy regulates development and related activities within 30 m of a salt marsh. All salt marshes in the province are designated as provincially significant.

Size Assessment Salt Marshes: Very Good

The Acadian Peninsula bioregion contains a total of 4,787 ha of salt marsh, representing more than 6% of all "critical salt marshes" in the Ecoregion as identified in the NAAP. Within the Bioregion, 44% of the salt marshes meet or exceed the NAAP critical size criteria. Coastal marshes along the Gulf of St. Lawrence were ditched and drained to create drier soils for livestock pasturing and haying and were considered very important during early agricultural activities (Hatvany 2001). However, salt marshes in the Acadian Peninsula Bioregion have not been impacted to quite the same extent as have other parts of the province (L. Swanson pers. comm.). These habitats have certainly experienced some impacts and reduction of area through causeway and road developments, campgrounds, inland dune migration due to coastal storms/surges, infilling for development, loss of buffers and natural dunes (hard development

on the dune) (L. Swanson pers. comm.). However, there are still lots of salt marshes in the bioregion, and still lots of opportunity for securement of natural marshes.

Overall Assessment Salt Marshes: Very Good

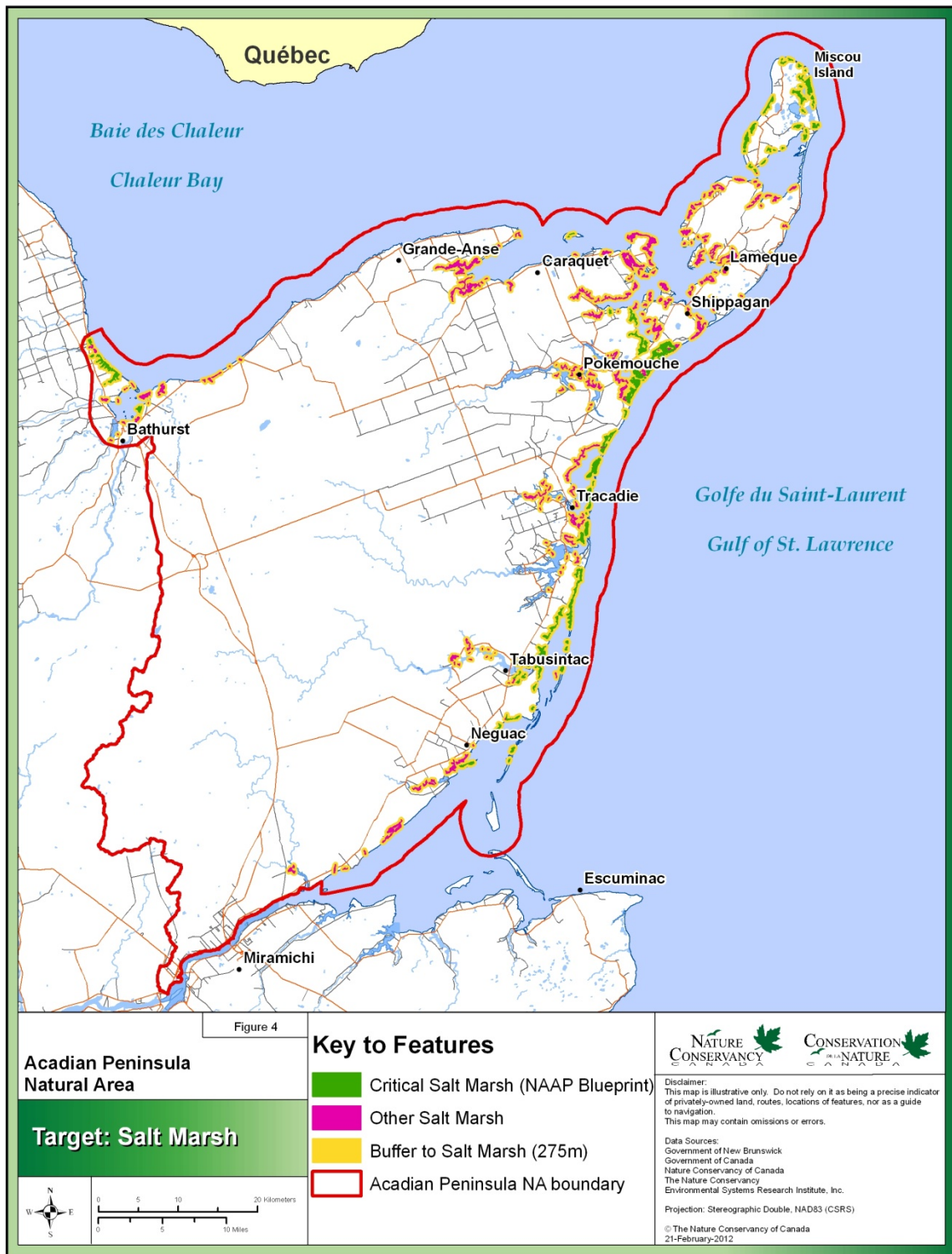


Figure 5. Location of Salt Marshes within Acadian Peninsula Bioregion.

Priority Habitat: Coastal Islands

Target Definition Coastal Islands: Several coastal islands of different sizes are found within this bioregion: Indian, Pokeshaw Rock, Caraquet, Pokesudie Islet, Munroe, Tern (NCC owned) and Portage (NWA) (Figure 6). The typical “sand islands” found in the bioregion are included in Beaches/Dunes systems target. The target excludes Miscou, Lamèque, Pokesudie and Hay Islands as these are linked to the mainland by a road and because other biodiversity targets are found there (e.g. Beaches/Dunes and Freshwater Wetlands).

Ecological Justification Coastal Islands: Islands can be more valuable to wildlife than other similar type habitat located on the mainland because they are more likely to be free of mammalian predators and provide excellent habitat for many species of birds (NB Eastern Habitat Joint Venture 2007). Coastal islands in the Bioregion are recognized for supporting large numbers of waterfowl, providing Piping Plover breeding areas and regionally important colonies of Great Blue Heron, Black-crowned Night Herons, Double-crested Cormorant (*Phalacrocorax auritus*) and Common Terns as well as large concentrations of shorebirds. Other significant species for this habitat type are listed in Appendix B.

Landscape Context Assessment Coastal Islands: Good

Islands are isolated by water, but may be subject to varying levels of access and disturbance based on their location and activities in surrounding waters. Greater proximity to population centres would result in increased boat traffic from nearby marinas and likely increased use by people stopping and disembarking on the island. Aquaculture leases exist in the waters off several islands in the bioregion, including Caraquet, Tern, Munroe, and Portage Islands and Pokesudie Islet. As current development is minimal on these islands and they are difficult for the general public to access, the associated impacts from threats do not have the same severity as do other coastal lands. For this reason, the ecological processes are evolving in a more natural, undisturbed manner.

Condition Assessment Coastal Islands: Good

Coastal Islands in the bioregion are mostly undeveloped and covered by natural vegetation. The exception to this is Caraquet Island which is privately owned by multiple owners and has several recreational buildings. There are a few restrictions that would prevent similar development on other privately owned islands. Indian Island in Bathurst Harbour is privately owned; Pokeshaw Island is owned by DNR and makes up part of a provincial park in the area – its “sea stack” formation is host to a Double-crested Cormorant colony that is an ecotourism draw for northeastern NB (MacKinnon and Kennedy 2007); Pokesudie Islet in Petite Passe is privately owned with multiple owners; Munroe Island in Saint-Simon-Nord Bay is privately owned; Tern Island is owned by NCC and the squatter shacks have now been removed, leaving it entirely natural for the large tern colony that is found there; and Portage Island in Miramichi Bay is a National Wildlife Area. These islands provide valuable habitat that supports a large diversity of species including the endangered Piping Plover and colonial nesting birds. The island habitat and supported species is generally not as impacted as other coastal lands by recreational uses and disturbances.

Size Assessment Coastal Islands: Not applicable

Islands in the bioregion are considered important regardless of size because they host a large number of island-dependant species, including shorebirds and colonial nesters. The Acadian Peninsula has islands that range in size from 0.3 – 349 ha, the smallest being Pokeshaw rock and the largest, Portage Island. Three of the seven targeted islands in the bioregion are already under conservation protection.

Overall Assessment Rank Coastal Islands: Good

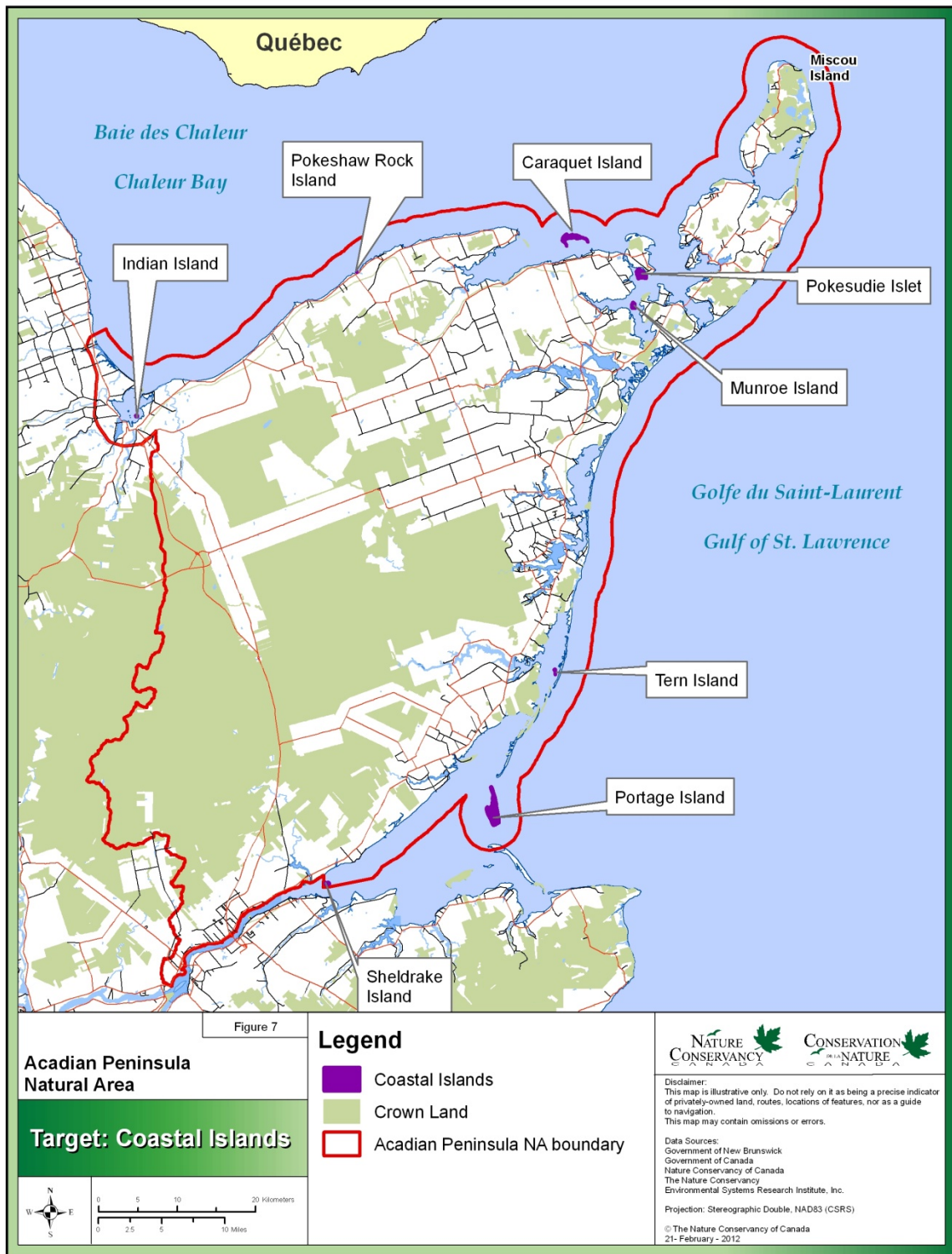


Figure 6. Coastal Islands in Acadian Peninsula Bioregion.

Priority Habitat: Freshwater Wetlands

Target Definition Freshwater Wetlands: Freshwater wetlands within the bioregion include bogs, marshes, fens, swamps and riparian floodplain. Bogs are the most common wetland type in this area. When combined, bogs (54%) and fens (20%) make up approximately 75% of all freshwater wetlands in the Bioregion. Other freshwater wetland types include shrub wetland (24%), freshwater marsh (1.1%), forested wetland (0.5%) and aquatic beds (0.15%). All freshwater wetlands, including critical occurrences from the NAAP (size = > 20.2 ha; LCI=<20 and for bogs size = > 30.4 ha; LCI=<30, Anderson et al. 2006) are mapped in Figure 7.

Ecological Justification Freshwater Wetlands: Freshwater wetland systems in the Acadian Peninsula Bioregion provide habitat for many federally and provincially listed species, notably Wood Turtles, which are associated with wetlands, but also use grasslands and forested areas near wetlands (COSEWIC, 2007b). Approximately one third of Miscou and Lamèque Islands are covered in peatland and associated wetlands, making them important stopover sites for numerous migratory birds (Daigle and Gautreau-Daigle 2001). Due to their significant coverage of the area and vulnerability to commercial harvest, bogs are highlighted in this habitat conservation priority. Coastal raised bogs are an important component of the landscape of New Brunswick, harbouring rare and unique species and communities (Zelazny 2007). Many other priority species in BCR 14 such as Rusty Blackbird (*Euphagus carolinus*), Common Nighthawk (*Chordeiles minor*) and Sora, all found in the bioregion, will markedly benefit from the conservation of freshwater wetland habitats (Environment Canada 2012c). Other significant species for this habitat type are listed in Appendix B.

Landscape Context Assessment Freshwater Wetlands: Very Good

Freshwater Wetlands cover approximately 7% of the land portion of the bioregion. The average LCI for Freshwater Wetlands in the Bioregion is 21, which is considered Good / Very good (calculated from NAAP data). Most wetlands in the bioregion are surrounded by natural cover. Peatlands have been subject to commercial harvest for several decades; however, 75 % of the peatland area on the Acadian Peninsula is still in its original state (not harvested) (Thibault pers. comm.). Where a portion of bog has been harvested, the hydrologic regime is negatively impacted in the remainder of the bog.

Condition Assessment Freshwater Wetlands: Good

New Brunswick currently has a Wetlands Protection Policy which requires a permit for work in or within 30 metres of all wetlands in the province. An interim approach to application of this policy is to only apply it to maps identified on the official Service New Brunswick Map of Wetlands. However, many naturally occurring wetlands are not identified on this map because of land ownership issues (industrial freehold) and through failure to classify swamps with merchantable timber as wetland. A long term management strategy for wetlands is currently being developed, which could have tremendous impact on the conservation objectives for wetlands in New Brunswick. Bogs are also subject to the Peat Mining Policy and if on Crown Land are subject to the *Quarriable Substances Act*. The policy wants to maximize the benefits of peat by promoting increased processing in the province and post-mining site reclamation.

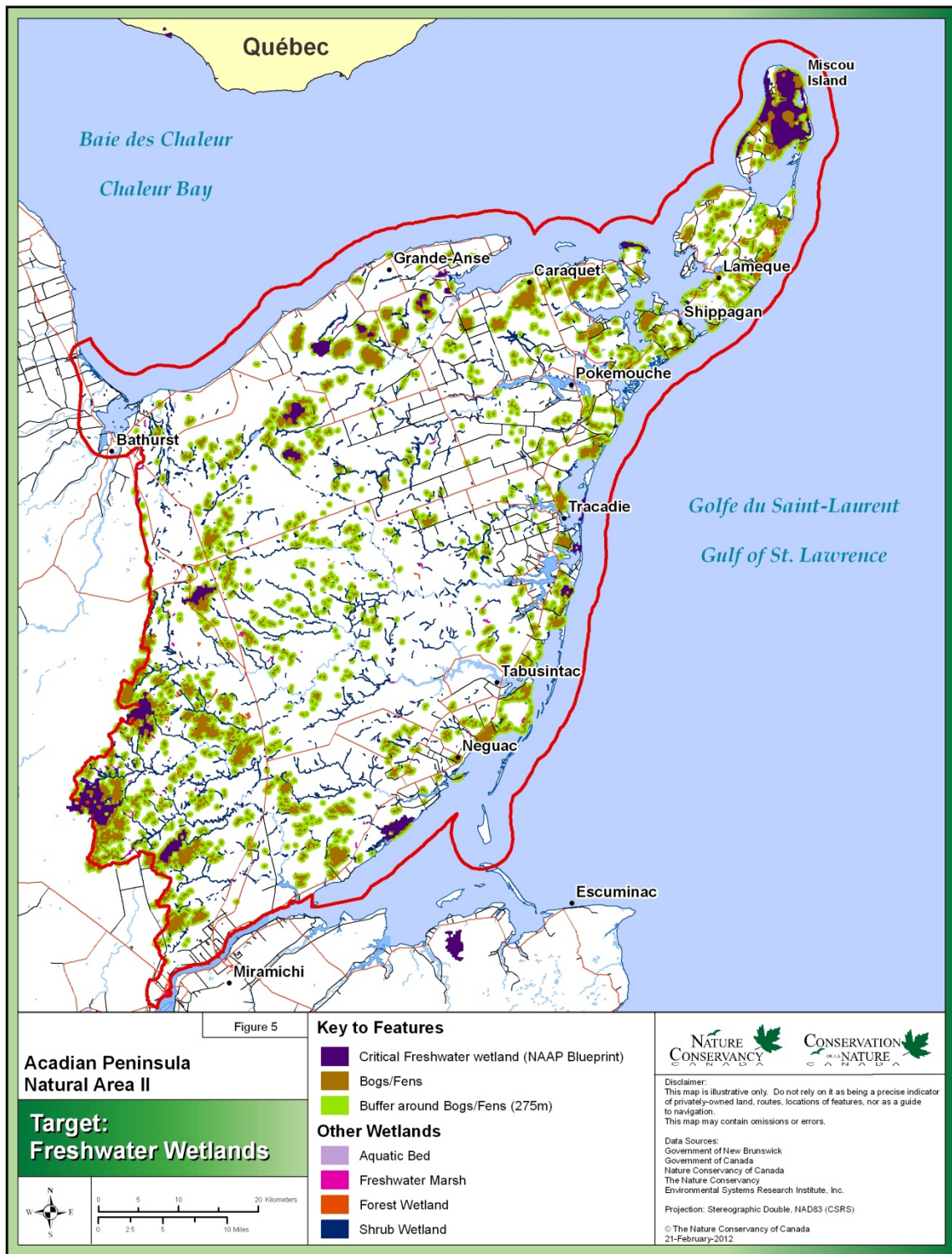
On unmined peatlands, there is extensive use of the bogs by ATV users, resulting in damage to the structure and hydrology. However, ATV users tend to stick to established 'trails' on the bogs, somewhat limiting the breadth of the impact. On those bogs that have been mined, the habitat has essentially been eliminated, as well as their potential for supporting a natural and rich biodiversity. However, unmined bogs in the bioregion are mostly still in good natural condition and these are the ones on which the viability assessment is based.

Size Assessment Freshwater Wetlands: Fair

The total peatland area in the Acadian Peninsula is 21,700 ha with 121 individual peatlands (Thibault, unpublished data). Of this, the total peatland area used by the peat industry since 1942 is 4,750 ha (22 %) which includes 30 individual peatlands. This total includes peatland area currently in production as well as peatland area that was in production but that has been or is in the process of being restored to natural wetland habitat (Thibault, unpublished data). This is only a portion of the 14,500 ha of peatland area considered to have commercial potential. This depends on factors such as average peat thickness, grade of peat, size of peatland, etc (J. Thibault unpublished data). The total peatland area used in agriculture (i.e. cranberry production) is 95 ha, representing 0.4 % of the bioregions area and includes 3 individual peatlands (Thibault unpublished data).

Because the total area of this finite resource is decreasing, size viability is considered fair. Because of the severity and irreversibility of harvesting bogs, this was given more weight than the other two viability categories in determining the overall viability of the target.

Overall Assessment Freshwater Wetlands: Fair



Priority Habitat: Acadian Forest Mosaic

Target Definition Acadian Forest Mosaic: The Forest Mosaic habitat includes old forest communities in the Acadian forest as defined by the New Brunswick Department of Natural Resources (see Appendix D). Seventeen unique communities have been identified by DNR which represent the full range of naturally occurring old-forest conditions (NB DNR 2011). The focus for this biodiversity target is old forest, cedar stands and forest adjacent to Protected Areas. As such, young forests are not considered under this definition. Cedar stands of any age are included in this target as their distribution is particularly significant in this Bioregion.

Forest habitat adjacent to preferred rivers for Wood Turtle will be targeted once DNR has released its conservation strategy for this species where nesting grounds will be identified. Old Forest stands and all cedar stands, as well as the two “NCC Core Forest” sites, derived from NAAP forest matrix blocks (size = > 10,117 ha) (Anderson et al. 2006) are mapped in Figure 8.

Ecological Justification Acadian Forest Mosaic: Old forest communities provide habitat for many federally and provincially listed species including Olive-sided Flycatcher, Chimney Swift and Canada Warbler. Many other high priority species in BCR 14 such as Northern Goshawk (*Accipiter gentilis*), White-breasted Nuthatch (*Sitta carolinensis*) and Blackburnian Warbler (*Dendroica fusca*) occur in older forest communities as well (Environment Canada 2012c). Other significant species for this habitat type are listed in Appendix B. It is important that sufficient amounts of the remaining old stands be conserved as they are a rare feature of the landscape due to past and current forest management practices in this region.

Landscape Context Assessment Acadian Forest Mosaic: Fair

In general, the old forest communities remain surrounded by natural cover; however 63% of the forest has recently been harvested or is relatively young. Fire suppression in areas of settlement affects the normal dynamic processes of this region but in general, fire still plays a role in maintaining a fire-adapted coniferous species composition. Forest patches across the Acadian Peninsula bioregion are generally well connected to the surrounding landscape with 84% of all forest having received a high score for connectivity in a study conducted by TNC for the NAAP ecoregion (Anderson and Clark 2012). However, it must be noted that young and old forests are grouped together for the purposes of this evaluation. This assumes that forests that are contiguous provide connectivity for all species regardless of the age of the forest patches, which is not necessarily the case ecologically.

Condition Assessment Acadian Forest Mosaic: Good

Human influence over the past 200 years has simplified the forest structure, composition and age class. Old stand types are far less abundant than were historically present in this area (Erdle and Sullivan 1998). Of the forest remaining on the landscape, approximately 27% is in a mature or overmature developmental stage (NB DNR 2011). Cedar stands are much less abundant; less than 1% of the overall forest is mature cedar forest. The majority of the cedar forest is in a mature/overmature state with only 4.5% in a young or regenerating developmental stage. Only 4% of the forest shows very recent harvesting or silviculture activity (from 2000-2009; NB DNR 2009). High occurrence of coniferous forest in this bioregion is the result of a combination of high fire frequency and acidic, wet soils. Fire-adapted species such as Trembling Aspen, Jack Pine, Red Pine, White Pine (*Pinus strobus*) and Black Spruce are evidence of the importance of fire in this region (Zelazny 2007). Population densities of Species at Risk such as Canada Warbler and Olive-sided Flycatcher are relatively high in this area. The Acadian

Peninsula Bioregion is part of the Maritime Lowlands Ecoregion which has the highest population density of Canada Warblers in New Brunswick (COSEWIC 2008).

Size Assessment Acadian Forest Mosaic: Fair

Historical records indicate that old growth forest in the Acadian forest used to occupy an estimated 50% of the land base prior to European settlement, but it is estimated to have been reduced to less than 1% of the forest in New Brunswick (Mosseler et al. 2003). Historical estimates of old forest patch abundance in the Acadian Peninsula bioregion are not possible but this area has been subjected to a similar amount of forest harvesting on Crown and industrial freehold as in other areas in New Brunswick so a similar trend is expected. Only 34% of the old forest (not to be equated with old growth forest) found and 26% of the cedar stands in the Acadian Peninsula bioregion meet the minimum patch size criteria (NB DNR 2011).

Overall Assessment Rank Acadian Forest Mosaic: Fair

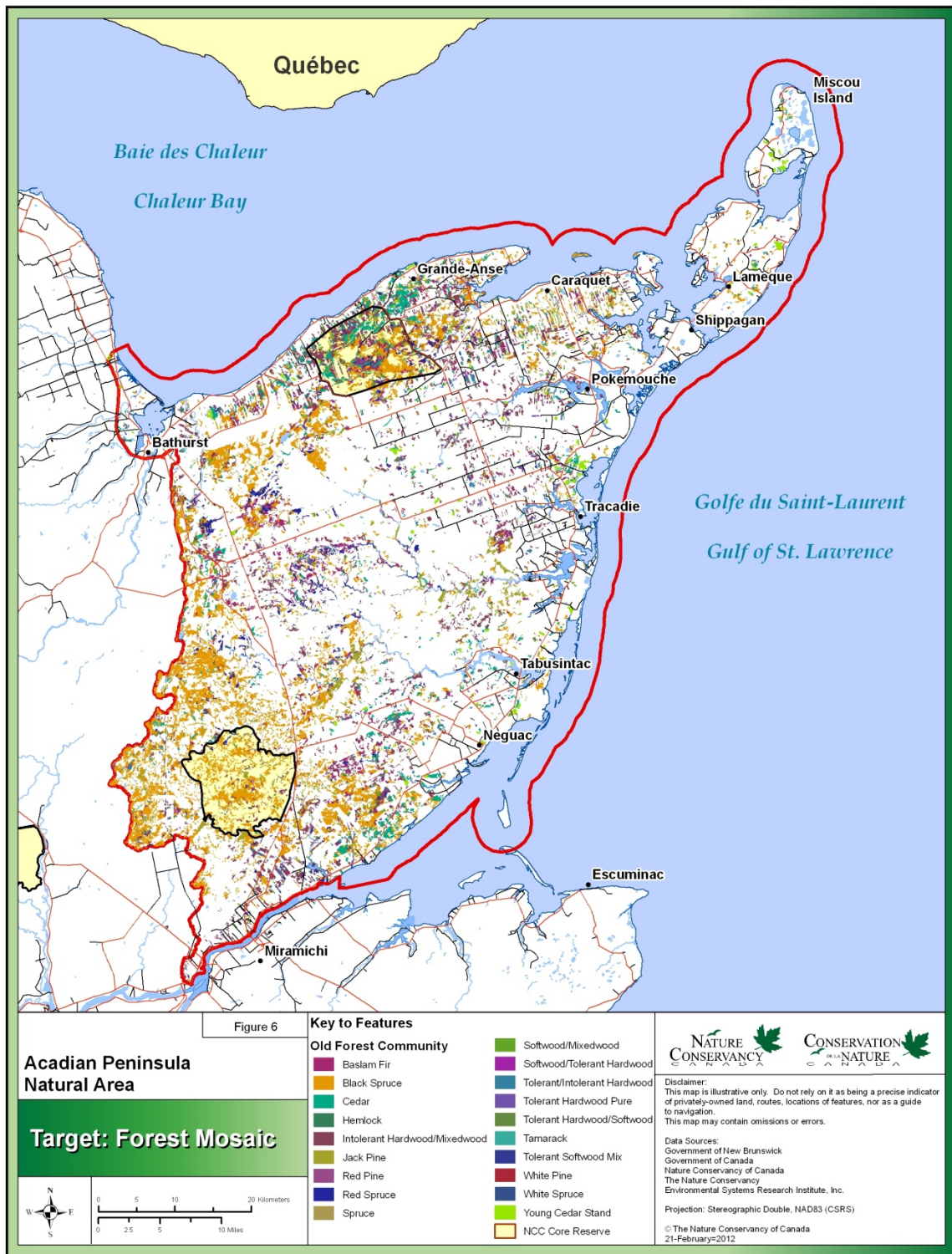


Figure 8. Location of Forest Mosaic habitat within Acadian Peninsula Bioregion.

Priority Habitat: Grasslands

Target Definition Grasslands: Grassland birds are those that typically rely on grassland habitats during the breeding season. The naturally occurring *Spartina* spp. grasslands are included in the salt marshes habitat category. In the Acadian Peninsula, grassland bird habitats, with the exception of coastal *Spartina* spp., are all human created. The federally designated (threatened) bird species Bobolink is strongly associated with this type of habitat and almost exclusively uses agricultural landscapes. Other species of consideration are Vesper Sparrow, Upland Sandpiper and Barn Swallow. The presence of grassland birds in 100km² cells and location of agricultural lands are presented in Figure 9 as a rough approximation to the location of grassland birds in the Acadian peninsula Bioregion. Grasslands are mostly associated to the sedimentary soils along the coast with some smaller interior patches associated with secondary roads and human settlement.

Ecological Justification Grasslands

There are a number of grassland bird species in the bioregion that are Species at Risk and require grassland habitats for nesting and foraging. The conservation of habitat for Bobolink may also help to conserve a variety of other declining species in the bioregion that are also associated with grasslands, including, (but not limited to,) species such as Barn Swallow, Savannah Sparrow and Vesper Sparrow and Upland Sandpiper, a species which was initially identified through the conservation blueprint process. Cultivated and managed areas, particularly those near water, are important in terms of biodiversity and are used by a broad variety of species (Environment Canada 2012c). Continent-wide declines in birds associated with grasslands have been observed, more than in any other bird group (Environment Canada 2012c). Various species of waterfowl, raptors, shorebirds, upland gamebirds and songbirds rely on grasslands for nesting and other habitat functions (US Department of Agriculture, Natural Resources Conservation Service 1999). Other significant species for this habitat type in the bioregion are listed in Appendix B.

The Bobolink population has decreased compared to several decades ago (Martin and Gavin 1995), particularly in the core of its range in Eastern Canada (COSEWIC 2010). This is due to a variety of factors, many of which relate to threats to these species in their wintering habitat. This trend is likely exacerbated in the Acadian Peninsula due to changing local land-use practices. Between 1968 and 2008, the Canadian population of Bobolink decreased by 5.2 % per year; however, from 1998 to 2008 the rate slowed to 4.6 % per year. The current Canadian breeding population is approximately 2 million individuals (COSEWIC 2010). Other populations of species designated as at risk such as the Barn Swallow (threatened) and Eastern Meadowlark (threatened) have also been declining. For instance, over the last 20 years, the Canadian Barn Swallow population has declined by 55% (COSEWIC 2011a). During the same period of time, the Canadian Eastern Meadowlark population went down by 29% (COSEWIC 2011b).

Landscape Context Assessment Grasslands: Fair

Within the bioregion, 10% of the Tabusintac Ecodistrict is non-forested and 30% for the Caraquet Ecodistrict (Zelazny 2007). Agriculture represents 22% of the non-forested area for the Tabusintac Ecodistrict and 25% for the Caraquet Ecodistrict (Zelazny 2007). Probably the highest threat to Bobolink habitat on the Acadian Peninsula is the reversion of family farms back to shrubland and forest. Prior to using agricultural non-native habitats, the presence of grassland birds was probably minimal in this area and they probably used ephemeral habitats such as natural openings, burns or beaver meadows.

Condition Assessment Grasslands: Unknown

Grassland birds in the bioregion that use cultivated and managed areas are affected by the agricultural practices such as the mowing of hayfields during the breeding season. The reproductive success of these birds is affected by incompatible farm practices such as earlier hay harvests. When hay crops are harvested earlier and at more frequent intervals (e.g. more than once a season), grassland birds don't have sufficient time to complete their nesting cycle (Nocera et al 2005, U.S. Department of Agriculture, Natural Resources Conservation Service 2010).

Size Assessment Grasslands: Fair

Generally, the types of habitats used by these species are declining in the province as the number of farms is decreasing (Environment Canada 2012c; Walls 2011).

Overall Assessment Rank Grasslands: Fair

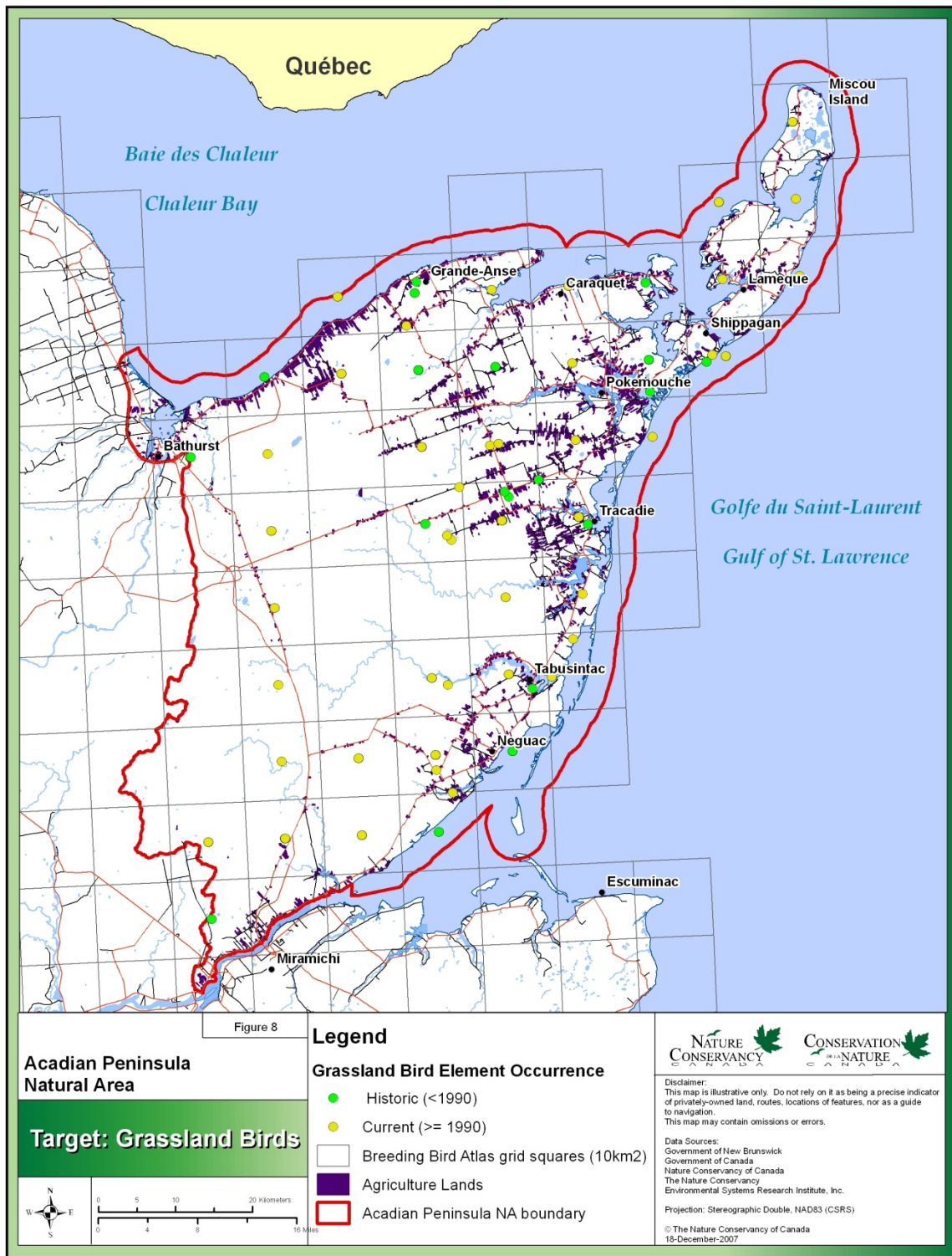


Figure 9. Location of Grassland habitat within Acadian Peninsula Bioregion.

Table 7a. Habitat Assessment for the Acadian Peninsula Bioregion.

Priority Habitat Type	Assessment			Overall Assessment
	Landscape Context	Condition	Size	
Beaches & Dunes	Very Good	Fair	Good	Good
Salt marshes	Very Good	Very Good	Very Good	Very Good
Freshwater Wetlands	Very Good	Good	Fair	Fair
Forest Mosaic	Fair	Good	Fair	Fair
Coastal Islands	Good	Good	N/A	Good
Grassland Birds	Fair	Unknown	Fair	Fair
Overall Habitat Assessment for the Bioregion:				Good

Table 7b. Description of the assessment ranks of ecological integrity of the conservation priority habitat types for the Acadian Peninsula Bioregion.

Rank	Description
Very Good	Ecological Integrity is Optimal: The structure, species composition, and key ecological processes and functions of the habitat conservation priority are intact and unimpaired by anthropogenic stresses. Ecosystems are functioning at a level comparable with the natural or historic range of variation for that ecosystem, and its capacity for self-renewal is maintained. The habitat conservation priority requires little or no management.
Good	Ecological Integrity is Good: The structure, species composition, and key ecological processes and functions of the habitat conservation priority are somewhat impaired by anthropogenic stresses. Ecosystems are functioning within a range of acceptable variation compared with the natural or historic range of variation for that ecosystem, and may require some management.
Fair	Ecological Integrity is Degraded: The structure, species composition, and key ecological processes and functions of the habitat conservation priority are impaired by anthropogenic stresses. Ecosystems are functioning below the range of acceptable variation compared with the natural or historic range of variation for that ecosystem, and require management, without which the habitat conservation priority will be vulnerable to serious degradation.
Poor	Imminent Loss of Ecological Integrity: The structure, species composition, and key ecological processes and functions of the habitat conservation priority are seriously degraded by anthropogenic stresses. Ecosystems are functioning well below the range of acceptable variation compared with the natural or historic range of variation for that ecosystem, and require significant management and/or restoration. Allowing the habitat conservation priority to remain in this condition for an extended period will make successful restoration highly improbable.
Unknown	Research Need: The habitat conservation priority is known to occur, but information on this assessment criterion is currently unknown.
N/A	Not Applicable: This criterion is not significant for assessing the ecological integrity of the habitat conservation priority.

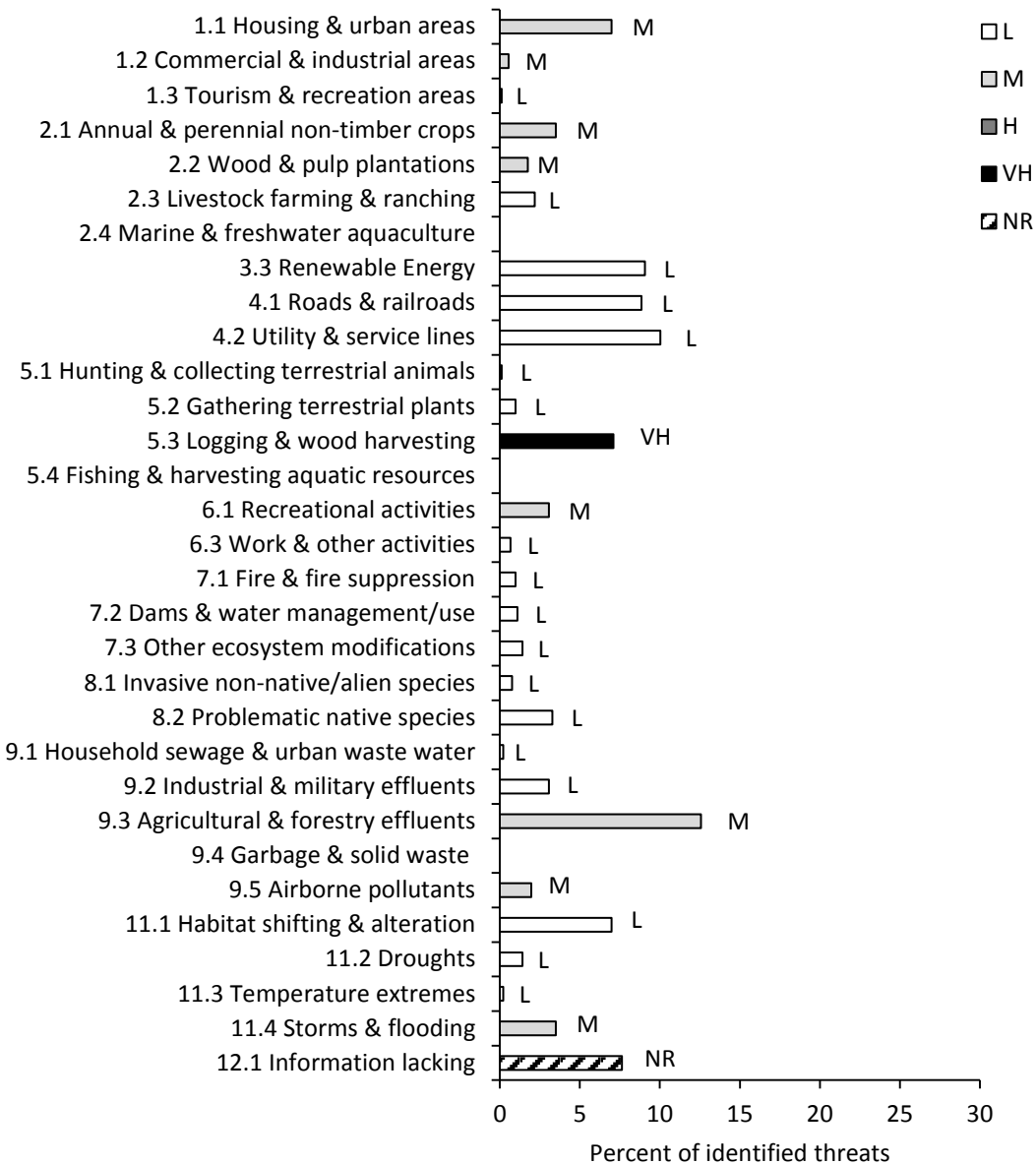
B. THREATS

i. Current Threats

Threats are the proximate activities or processes that have caused, are causing or may cause the destruction, degradation and/or impairment of one or more of the identified habitat type conservation priorities. Threats impact the habitat's ecological integrity and/or key ecological attributes. Threats to the priority habitats targets were identified using past studies, local expert knowledge, and a review of the literature. Threats identified for BCR 14 and MBU 12 (Environment Canada 2013) are listed in table 8 as well as Figures 10 and 11, respectively. These are further illustrated in Figures 12 - 15 and were examined for specific relevancy to the Acadian Peninsula Bioregion. The threats identified within this Habitat Conservation Strategy are thought to be comprehensive for the Bioregion's habitat types (Table 8). These threats were ranked based on their scope, severity and irreversibility of damage to habitats over a 10-year period using the Conservation Action Planning Workbook (Low 2003), and were categorized using established international taxonomy (IUCN-CMP 2006a), with local descriptions. Table 9 provides a summary of the threats identified from the Acadian Peninsula Bioregion. The Human Footprint map, developed by the Wildlife Conservation Society (Woolmer 2008), is a good proxy for the threat of development as it is derived from layers of human land development and infrastructure. The human footprint impact in the Bioregion is mapped in Figure 12. The geographic extent of each identified threat is indicated, where known, in Figures 13 – 15.

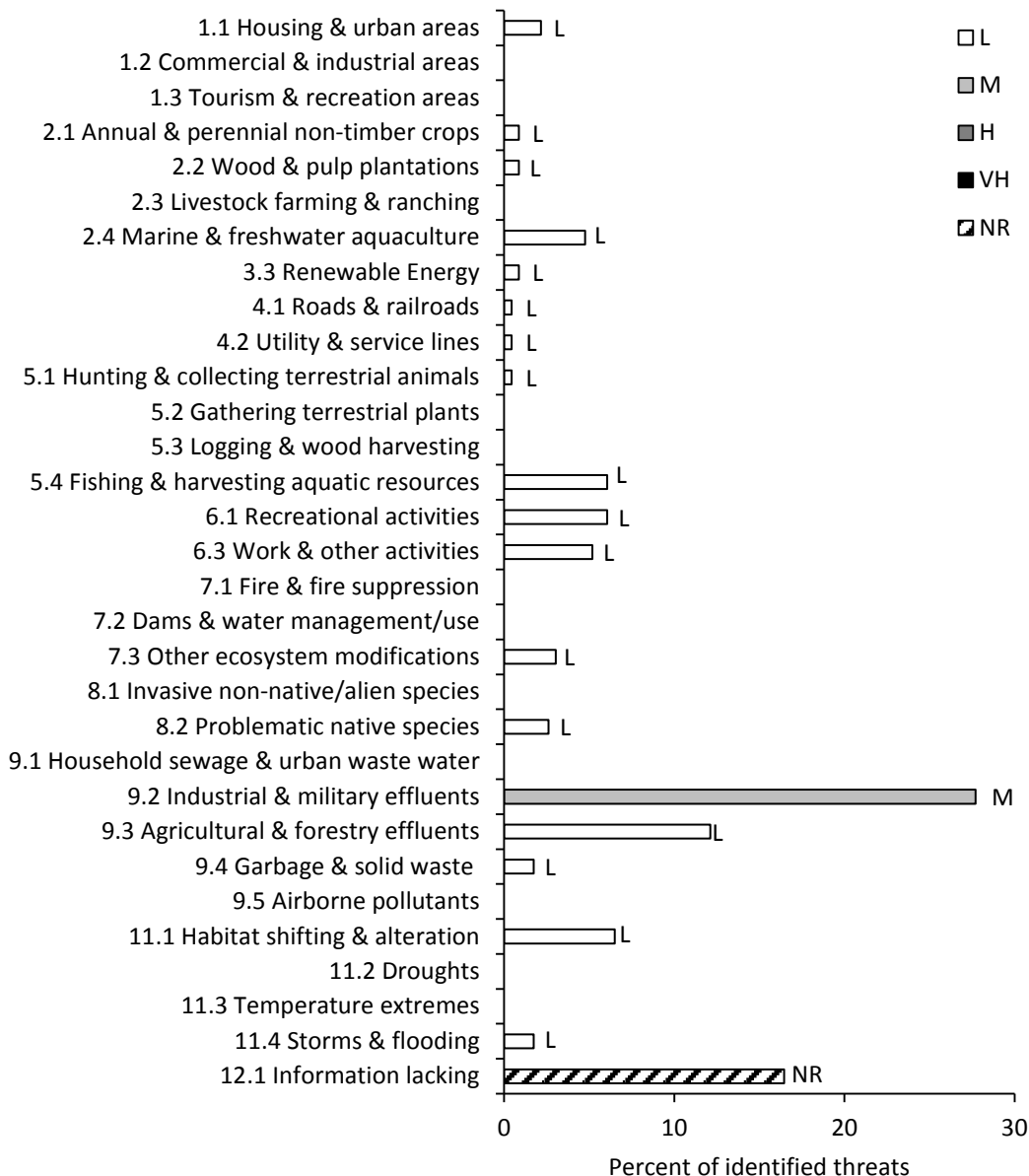
Table 8. Relative magnitude of identified threats to priority species within BCR 14 NB, and MBU 12 NB by threat category and broad habitat class. L = Low magnitude threats; M = Medium; H = High; VH = Very High. Blank cells indicate that no priority bird species had threats identified in the threat category / habitat combination. Adapted with permission from Environment Canada 2013.

Threat Category	BCR 14 Habitat Classes													MBU 12 Habitat Classes			
	Coniferous forest	Deciduous forest	Mixed forest	Shrub/Early Successional	Herbaceous	Cultivated and Managed Areas	Urban	Wetlands	Inland Waterbodies	Coastal – Above High Tide	Riparian	Widespread	Overall	Marine Waters	Coastal— intertidal	Widespread	Overall
Overall	H	M	M	L	L	M	M	M	M	M	M	M		M	M	L	
1. Residential & commercial development	L	L	L	L	L	M	H	M	L	M	M	L	M		L		L
2. Agriculture & aquaculture	L	M	M			H		M		L	L		M	M	L		L
3. Energy production & mining	L	L	L		L							L	L		L	L	L
4. Transportation & service corridors	M	L	L		L			L		L	L	L	L		L		L
5. Biological resource use	VH	VH	H					H	L	L	H		VH	L	L		L
6. Human intrusions & disturbance					L		L	L	M	M	L		M		M		L
7. Natural system modifications	L	L	L	L		L		L	L	M	L		L		M		L
8. Invasive & other problematic species & genes	L	L	L	L	L	L		L	L	M	L		L	L	L		L
9. Pollution	H	M	M	L	L	M	L	M	M	M	M		M	M	H		M
11. Climate change & severe weather												H	H			M	M



Note: If 100 threats were identified in total for all priority species in BCR 14 NB, and 10 of those threats were in the category 1.1 Housing & urban areas, the bar on the graph would represent this as 10%). Progressive shading in the bars (from L: low, M: medium, H: high, to VH: very high) represents the rolled up magnitude of all threats in each threat subcategory in the BCR.

Figure 10. Identified IUCN categories of threats to priority bird species within BCR 14 NB expressed as percentage of total number of threats as well as magnitude of threat. Adapted with permission from Environment Canada 2013.



Note: If 100 threats were identified in total for all priority species in MBU 12 NB, and 10 of those threats were in the category 1.1 Housing & urban areas, the bar on the graph would represent this as 10%). Progressive shading in the bars (from L: low, M: medium, H: high, to VH: very high) represents the rolled up magnitude of all threats in each threat subcategory in the BCR.

Figure 11. Identified IUCN categories of threats to priority bird species within MBU 12 NB expressed as percentage of total number of threats as well as magnitude of threat. Adapted with permission from Environment Canada 2013.

Table 9. Summary of Threats to the Acadian Peninsula Bioregion and Priority Habitats.

Threats¹	Beach / Dune	Salt marsh	Freshwater Wetland	Forest Mosaic	Coastal Islands	Grassland	Overall Threat
1.1 Housing and Urban Areas 1.1.1 cottage and residential	high	high	medium	low	high	low	High
1.1 Housing and Urban Areas 1.1.2 Squatters on beaches / islands	medium	low	n/a	n/a	low	n/a	Low
1.3 Tourism and Recreation Areas 1.3.1 Campgrounds	low	n/a	n/a	n/a	low	n/a	Low
2.1 Annual & Perennial Non-Timber Crops 2.1.1 Cranberry Farming	n/a	n/a	low	n/a	n/a	n/a	Low
2.1 Annual & Perennial Non-Timber Crops 2.1.2 Incompatible farm practices	n/a	n/a	n/a	n/a	n/a	Unknown	Unknown
2.4 Marine, Freshwater Aquaculture 2.4.1 Marine Aquaculture	low	low	n/a	n/a	low	n/a	Low
3.2 Mining & Quarrying 3.2.1 Peat Harvesting	low	low	very high	low	n/a	n/a	High
3.3 Renewable Energy 3.3.1 Wind Farming	low	low	low	low	low	low	Low
5.3 Logging and Wood Harvesting 5.3.1 Incompatible Forestry Activities	n/a	n/a	medium	high	n/a	n/a	Medium
6.1 Recreational Activities 6.1.1 ATVs	medium	low	low	low	n/a	n/a	Low
6.1 Recreational Activities 6.1.2 Recreational Beach Use	low	n/a	n/a	n/a	low	n/a	Low
11.1 Habitat Shifting & Alteration 11.1.1 Sea-level Rise and erosion	very high	medium	medium	n/a	medium	n/a	Medium
Overall Threat Status for Priority Habitats and Bioregion	Medium	Low	High	Medium	Medium	Unknown	High

¹Threat nomenclature is based on the IUCN classification of direct threats (IUCN-CMP 2006b).

Very High	The threat is likely to <i>destroy or eliminate</i> the priority habitat
High	The threat is likely to <i>seriously degrade</i> the priority habitat
Medium	The threat is likely to <i>moderately degrade</i> the priority habitat
Low	The threat is likely to <i>only slightly impair</i> the priority habitat
-	The threat's impact on priority habitat is <i>negligible</i>
Unknown	The threat's impact on priority habitat is <i>unknown</i>

1.1.1 Cottage and Residential Development: (Threat Status: High)

The demand for and pressure caused by development along coastal areas has been increasing (New Brunswick Department of Environment and Local Government 2002, MacKinnon et al. 2011). Shoreline development is a threat to the coastal regions of this area (Sabine 2002). The coastal regions of New Brunswick are experiencing a phenomenon called “coastal squeeze” where natural habitats are surrounded by houses, roads, and rock walls. Natural habitats are physically prevented from adapting to natural and human-induced changes in sea-level (Hanson et al 2006). Habitat loss due to residential developments is one of the main threats to species associated with coastal habitats (Sabine 2002, NB EHJV 2007, and Environment Canada 2012c). The presence of coastal bogs adjacent to beaches and dunes in the Acadian Peninsula Bioregion has had a limiting effect on the proximity of development to these habitats (Bérubé pers. comm. 2012). Whereas these coastal ecological systems are naturally dynamic, hardening of the coastline with an associated loss of sediment supply and changes to alongshore sediment transport could prevent the natural evolution of coastal systems (Bérubé pers. comm. 2012).

Although the residential development trend is less pronounced in northeastern NB as compared to the southeastern region, the presence of sandy beaches, warm water and low elevation make this an attractive area for coastal development. Historically, the primary land use alteration affecting salt marsh habitat in the Gulf of St. Lawrence has been residential development and associated infilling of salt marshes and alteration of adjacent habitat (Roberts 1993, Maillet 2000, Milewski et al. 2001). New Brunswick has a Wetland Conservation Policy as well as a Coastal Areas Protection Policy that now offer some protective measures for coastal features such as beaches, dunes and salt marshes (New Brunswick Department of the Environment and Local Government 2002). Nevertheless, the demand for coastal dwellings continues to increase and this has resulted in coastal real estate becoming more valuable, which in turn results makes the illegal infilling and modification to coastal features still a moderate threat (Sabine 2002). In addition to direct destruction through infilling, local development also indirectly impairs habitat quality with increased use and disturbance (Gautreau 2008) and associated water quality impairment.

The erection of breakwaters and retaining walls, as measures of erosion control around developed coastal properties, result in habitat loss, because sand dunes and salt marshes do not have room to expand or move naturally (Stewart et al. 2007). Modification of shoreline sediment deposition rates caused by the use of riprap (a form of coastal hardening using large rocks) contributes to the degradation of these habitats and has a negative impact on species that use them (Environment Canada 2012c). Studies led by Serge Jolicoeur are presently being undertaken at l'Université de Moncton to better understand and evaluate the impact of sea-walls erected as breakwaters for construction and other developments along different sections of the Acadian Peninsula coast (Bérubé pers comm. 2012).

1.1.2 Illegal Camps on Beaches / Islands: (Threat Status: Low)

In the Acadian Peninsula Bioregion, some of the beaches are impacted by buildings erected by unauthorized persons, locally referred to as squatter shacks. Tracadie Beach, only accessible by boat, had 36 squatter shacks on it in 2009 (Roy et al. 2010). Severe winter storms in 2010 reduced this number. The vegetative structure under and around the footprint of these buildings and surrounding area (trails) is destroyed, allowing for an increased potential for blowouts, which is a sudden collapse of sections of dune by extreme wind and wave action. In the summer of 2006, a campfire started by one of the squatters spread (L. Richardson pers. comm.) and approximately 25% of the tern colony, one Red-breasted Merganser (*Mergus serrator*) nest and three Spotted Sandpiper nests were burned (Stewart et al. 2007). Additionally, the fire destroyed 12 shacks and burned a considerable amount of American

Beachgrass (*Ammophila breviligulata*, locally referred to as Marram Grass). Due to this fire and the loss of Marram Grass, the dune has become even more prone to erosion and blowouts (L. Richardson, person. comm.). In some cases, dune vegetation around the shacks is mowed, further weakening the system. Additionally, while outhouses are sometimes shared among multiple dwellings which cuts down on their number, untreated sewage on the dune remains an issue.

1.3.1 Campgrounds / Camping: (Threat Status: Low)

Camping, on campgrounds or unregulated and non-designated campsites, is extensive in coastal areas, particularly on Miscou Island. Campers can negatively affect Piping Plover habitat and nests as people sometimes camp directly on the beach (L. Richardson pers. comm. and D. Roy pers. obs.). Privately run and unregulated campsites pose a greater threat to coastal species than provincially regulated sites because the province does not permit camping on the beach. Tourism development is rapidly increasing in this region (Sabine 2002). An increase in local and provincial marketing of beaches increases the need for campgrounds. These must be appropriately regulated to reduce disturbance to fragile ecosystems and species. As will be discussed under threat 6.1.2 (recreational use), human activity near nesting Piping Plovers is correlated with poor fledgling success (Flemming et al. 1988). Prolonged pedestrian disturbance near nest sites and young are considered to be among the greatest threats to these birds during breeding (Flemming et al. 1988). The assessment for this threat on beaches was based on the potential repercussions on Piping Plover nesting beaches and other SAR found on beaches.

2.1.1 Cranberry Farming: (Threat Status: Low)

The total peatland area presently being used for cranberry production in the bioregion is 95 ha (3 individual peatlands, J. Thibault, unpublished data). While this is a small area, cranberry production is on the rise; given the vast availability of suitable habitat, this poses an emerging threat to natural habitats in the bioregion. Cranberries have traditionally been grown on wetland (organic) soils (Department of Agriculture, Aquaculture and Fisheries 2012). Cranberry production can occur through the creation of a suitable bed or the use of a bog that has already been harvested for peat. Using harvested bogs eliminates the potential for restoration back to a more natural habitat (Department of Agriculture, Aquaculture and Fisheries 2012). Existing cranberry operations constructed on formerly natural (harvested) peat bogs is shown in Figure 13.

2.1.2 Incompatible Farm Practices: (Threat Status: Unknown)

One of the main threats to grassland birds that use cultivated and managed areas are the agricultural practices themselves, such as mowing hayfields during the breeding season (Environment Canada 2012c). In such instances, the birds do not have sufficient time to complete their nesting cycle when hay harvest is done earlier and at more frequent intervals (Nocera et al 2005; U.S. Department of Agriculture, Natural Resources Conservation Service 2010). Overall threats also relate to habitat loss and fragmentation through the decrease in hayfield area and reforestation (Bollinger et al. 1990, Bollinger and Gavin 1992 in NatureServe 2011; COSEWIC 2010). Generally, the types of habitat required by grassland birds are declining in the province, as the number of farms is decreasing (Environment Canada 2012c; Walls 2011). The number of farms in the province went from 26,431 in 1951 to 2,776 in 2010, transitioning from traditional family farms to larger operations which are now typical of rural New Brunswick (Walls 2011). Timing of hay harvesting in particular can be detrimental to nesting birds as well as Wood Turtles, which face threats and mortality associated with farm machinery (COSEWIC 2007). The magnitude of this threat's impact on targets in the Acadian Peninsula is poorly understood and is a gap in knowledge that could be addressed.

2.4.1 Marine Aquaculture: (Threat Status: Low)

Shellfish aquaculture has been described as an important threat to the coastal resources along the Gulf of St. Lawrence shoreline (Sabine 2002). In addition to having direct impacts on the marine environment, the expanding aquaculture industry in the bioregion is a threat to coastal habitats (NB EHJV 2007). One of the major concerns is that of increased disturbance related to aquaculture activities (Environment Canada 2012c), such as getting to and from the site, garbage, etc. This threat is of particular concern to coastal waterfowl and shorebirds using the shorelines, including Piping Plover and Red Knot (Environment Canada 2013). There is also a risk of attracting predators (gulls) to Piping Plover and other nesting birds, affecting their population dynamics. There are also concerns that an increase in aquaculture sites would physically limit waterfowl access to traditional feeding areas. An increase in aquaculture leases may also result in salt marshes being loaded with organics, thereby reducing vital biological productivity (Sabine 2002).

3.2.1 Peat Harvesting: (Threat Status: High)

New Brunswick is the leading peat producer in Canada with most activity located in the northeastern section of the province (New Brunswick Department of Natural Resources 2012). Peatlands constitute a special case for wetland protection as they are also treated as a natural resource, subject to extraction and the provisions of the New Brunswick Peat Mining Policy, 2005. Approximately 70% of the peatlands occurs on public lands and the province of New Brunswick has been proactive in regulating the exploitation of peatlands through the *Quarriable Substances Act* (Poulin et al. 2004; New Brunswick Department of Natural Resources 2012). It is a significant threat, especially in northeastern New Brunswick where some bogs are over 8,500 years old (Thibault pers. comm. 2011). The reduction of habitat due to mining is somewhat offset in the long term - by virtue of the obligation to restore most of the former peat producing areas to wetland / peatland habitat (Thibault pers. comm. 2011). However, the restored site may not have the same habitat values and biodiversity of a natural site that has evolved over thousands of years. The principal issues of concern are: the impact of drainage water on receiving water bodies; the impact of habitat change on flora and fauna; the nuisance effect of wind-blown peat particles on surrounding ecosystems, and the issue of post-harvesting restoration or reclamation. Activities such as harvesting and ditching around the bogs alter the integrity of the remaining bog by depleting the water supply (Whitfield et al. 2006). Harvested sites rarely return to functional ecosystems after abandonment because drainage and peat extraction lower the water table and expose relatively decomposed peat, which is hydrologically unsuitable for sphagnum moss reestablishment (Whitfield et al. 2006). Some natural regeneration of Sphagnum has occurred in isolated pockets on traditionally harvested sites, for reasons that are poorly understood, but are related to natural functions that regulate runoff and evaporation (Seters and Price 2001). When peatlands are drained for development, the drainage waters change the quality of streams flowing out of bogs, thus affecting fish and invertebrates downstream (Sabine 2002). Additionally, peat dust created from the harvesting process can impact estuarine and salt marsh ecosystems. In some places peatlands are being heavily eroded by rising sea levels, especially on the east side of Miscou Island where some bogs are located directly along the coast. In some instances, machinery from peat harvesting companies have been driven onto the beach which could destroy vegetation and be detrimental to nesting Piping Plovers (L. Richardson pers. comm.) With increasing demand and pressure, there is potential to harvest bogs of a lesser economic value which otherwise would have been undisturbed. Peat extraction is one of the main threats for peatlands and coastal resources in New Brunswick (Poulin et al. 2004; Sabine 2002). The extent of harvested bogs is shown in Figure 13.

3.3.1 Wind Farming: (Threat Status: Low)

The Acadian Peninsula region is targeted for the potential development of wind farming. Since May 2011, 30 newly installed wind turbines, spread over 1,255 ha in Lamèque are now generating power. However, the long term effects are still unknown. Wind farm projects (land based and offshore) are increasing along the northeastern coast of North America and represent a potential conservation issue for migratory birds (Langston & Pullan, 2003). Studies have shown that collisions with the turbines themselves and destruction of nests associated with construction activities during the breeding season are the two main sources of bird mortality typically related to wind turbines (Pomeroy et al. 2010 in Environment Canada 2012c). The national average of birds killed per turbine is three per year and the habitat loss per turbine is approximately 1.25 ha (Environment Canada 2012c). The location and road infrastructure demands on the wind farm placements could have impacts on all biodiversity targets as it is related to habitat loss. In terms of Piping Plover, potential impacts are poorly understood because there is little information available regarding flight patterns and migratory routes. Upcoming studies in the US will be investigating the potential impacts of wind power development on breeding Piping Plovers on the Atlantic Coast (J. Rock pers. comm.). Species of birds considered most vulnerable to collisions with wind turbines include raptors and smaller common passerine species (Environment Canada 2012c). The Wind Atlas of New Brunswick has identified the Acadian Peninsula as having some of the best wind resources in the province, especially at the northeastern tip of the Bioregion (Mallet et al. 2007). However, despite government goals and subsidies, the industry has been slow to develop. The initial assessment of this threat was based on the potential threat to birds in the Bioregion and to direct impact of turbines and associated infrastructure.

More recently, it has also been noted that wind farms are an issue with migratory bats (Arnett *et al.*, 2008; Baerwald and Barclay, 2009). Despite the many environmental benefits of wind energy, the rapid growth of the wind energy sector around the globe has raised concerns regarding the impacts of these developments on both resident and migratory populations of wildlife (Arnett *et al.* 2008). Wildlife may be impacted by wind energy developments through direct mortality, changes to habitat availability, and disruption of movement patterns (e.g., foraging, mating, and migration). Wind turbines are now thought to have a negligible effect on bird populations compared to other man made impacts (Environment Canada 2013), and compared to other groups of wildlife. Documentation of large numbers of bat fatalities at wind energy facilities across North America has raised the profile of this issue as a primary environmental concern associated with their installation (Johnson 2005). In North America, the species most affected are the long-distance migratory bats, including the Hoary Bat (*Lasiurus cinereus*), the Eastern Red Bat (*L. borealis*), and the Silver-haired Bat (*Lasionycteris noctivagans*), which make up about 75-80% of the documented fatalities at wind energy developments, with the Hoary Bat alone comprising about half of all fatalities (Arnett *et al.* 2008; Kunz *et al.* 2007). In New Brunswick, the sparse data we have data suggests that there are some migratory movements of these species in or through the province. While still thought to be rare, they do occur regularly and are especially vulnerable to wind facilities (D.F. McAlpine, pers. comm.). Bat fatalities have also been reported in smaller numbers for resident hibernating bat species, including the Little Brown Myotis (*Myotis lucifugus*), the Northern Myotis (*Myotis septentrionalis*), and the Tri-colored Bat (*Perimyotis subflavus*) (Arnett *et al.* 2008; Johnson 2005).

The majority of the efforts to minimize conflicts between wildlife and wind energy developments have focused primarily on risk avoidance through pre-construction surveys of wildlife and careful site selection to avoid areas with high levels of wildlife usage (Weller & Baldwin 2012). The assumption of this approach is that low indices of activity prior to construction should translate to low fatality rates post-construction (Baerwald & Barclay 2009), assuming that there is no source of attraction to turbines for wildlife (e.g., lights to alert navigation). Given the anticipated proliferation of wind turbines, we

should continue to ensure that turbines are sited to avoid important wildlife habitats and migration corridors whenever possible. The Wind Atlas of New Brunswick has identified the Acadian Peninsula as having some of the best wind resources in the province, especially at the northeastern tip of the Bioregion (Mallet et al. 2007). However, despite government goals and subsidies, the industry has been slow to develop.

If wind farming does become more prominent within the Bioregion, the cumulative effects on avian and chiropteran (bat) species could result in a much higher threat ranking being warranted, both because the Acadian Peninsula is a well-known, important migratory bird corridor; it also remains to be determined whether it is a significant pathway for the migratory bat species as well. There is some evidence of mortality of migratory bat species at wind farm sites in NB, including in this bioregion. It is felt that a better recording and reporting mechanism for bat mortality at wind farm sites needs to be in place as we move forward (D.F. McAlpine, pers. comm.)

5.3.1 Incompatible Forestry Activities: (Threat Status: Medium)

Timber harvest and management is the main cause of change in the composition and structure of forests in New Brunswick, with the additional impact of fragmentation due to road and right-of-way construction (Environment Canada 2012c). Only about 5% of New England Acadian forest is in pre-settlement condition. The major conversion and degradation threats to this Ecoregion are development and logging (World Wildlife Fund 2002). This area has low productivity due to poor drainage and soil nutrients (Zelazny 2007). Approximately 60% of the forested land is owned by the Crown and is regularly cut and managed by licensees, while the other 40% is held in private woodlots. One of the primary harvesting techniques in New Brunswick is clear-cutting. It is not expected that forestry practices will change; however, setting aside up to 12,000 hectares in PNAs in conjunction with other stewardship activities will ensure that an adequate portion of forest habitat will be protected. The geographic extent of forest resource harvesting and silviculture for the Bioregion is shown in Figure 14.

6.1.1 All-terrain Vehicles: (Threat Status: Low)

The use of ATVs in wetlands and beaches is illegal under the Vehicle Trespass Act of New Brunswick; however, it still occurs frequently and enforcement is difficult. Disturbances through the illegal use of ATVs on beaches, bogs and marshes are a major concern. There are challenges with controlling access of ATVs in these sensitive habitats as they can go through all types of landscape and conditions. Extensive use of ATVs for recreation remains a prominent concern and can disturb wildlife directly, and severely damage wetland and coastal habitats as well as the species they support (Rock 2011 pers. comm.). The usage of all-terrain vehicles on the beaches has increased in recent years (Patrick Dobson pers. comm.). There is a risk of increasing use of existing sites (trails) and expansion into new high value areas. ATV traffic in the bogs destroys the vegetation by cutting ruts and causing long-lasting scars on the surface through extensive braided trail networks. Similarly, the crushing of Marram Grass increases erosion of coastal habitats. Damage from vehicles is minor compared to storm related erosion; however, the additional deterioration of the vegetation cover weakens the integrity of the beaches and dunes, which renders them more prone to erosion events such as blowouts, hence contributing to loss of habitat (D. Bérubé pers. comm.).

ATVs have the potential to disturb nesting Piping Plovers, which may lead to nest abandonment, possible crushing of nests and birds, and lower productivity (Stewart et al. 2007). Ironically, ATVs may have a temporarily positive impact on the Gulf of St. Lawrence Aster since they create openings in the plant cover, which increases the availability of light to the plants (Recovery Strategy for the Gulf of St. Lawrence Aster (*Symphyotrichum laurentianum*) in New Brunswick, Canada 2007). However, the long-

term damage caused by ATVs can degrade the habitat and therefore have a negative impact (Recovery Strategy for the Gulf of St. Lawrence Aster (*Symphyotrichum laurentianum*) in New Brunswick, Canada 2007). ATVs are also a threat to Wood Turtles, particularly adults, that suffer increased mortality rates by traffic on roads (Anon., 2002, Seburn and Seburn 2004, R. Brooks, pers. comm. 2004 in COSEWIC 2007).

6.1.2 Recreational Beach Use: (Threat Status: Low)

Many beaches are used heavily for recreation throughout the Bioregion. Beach use through tourism is increasing. The threats associated with traditional recreational beach uses (sunning, swimming, clambakes) include: the increased potential of beachgoers creating trails through beach and dune vegetation, the increased potential of garbage presence that can be ingested or attract predators, and general disturbance of birds at foraging, nesting and roosting sites (Environment Canada 2012c). The scope of impact tends to be limited as most beach users don't walk far from parking areas. However, with the growing use of motorboats, there is the potential for increased human activity at remote beaches and in coastal areas that are more difficult to access. Human disturbance can compromise Piping Plover fledging success, and can make prime habitat or unsuitable for nesting (Stewart et al. 2007). Symbolic fencing is a good method that can be applied to minimize human disturbances; otherwise, even though habitat is there, Piping Plover may be unable to use it (L. Richardson pers. comm.). Furthermore, nests have been inadvertently destroyed by the efforts of some people to "clean" the beaches of washed up vegetative matter and other debris, including garbage (i.e., tidal wrack) so that campers and tourists can enjoy smooth sandy beaches (L. Richardson pers. comm.).

There have been increasing local and provincial efforts at marketing beaches as tourist destinations. Tourism development is rapidly increasing in this region (Sabine 2002). Ecotourism driven activities such as boating and the quickly increasing popularity of kiteboarding, kite buggying and kayaking in the area all cause potential threats due to related human usage as they intensify and expand human activity into more remote coastal areas. A 'Windfest' is held yearly during the last week of June in the communities of Shippagan, Lamèque and Miscou (Tourism New Brunswick 2010). The region is promoted by Tourism NB as the best place in Canada for kitesurfing because of constant wind and shallow warm water within the lagoons. Kite buggies are driven onto the open areas of beaches and dunes, potentially destroying vegetation and disturbing wildlife (L. Richardson pers. comm.). Activities expanding throughout coastal lagoons increase the risk of disturbance to colonial nesting birds (NB EHJV 2007). Human disturbance to estuaries must be carefully managed to ensure that sensitive species and habitats are not degraded or damaged (Sabine 2002).

11.1.1 Sea-level Rise and Erosion: (Threat Status: Medium)

The degree to which the coastline of the Acadian Peninsula may experience physical changes (flooding, erosion, beach migration, and coastal dune destabilization) due to climate change and accelerated sea level rise is predicted to be moderate to high (Shaw et al., 1998). The geographic extent of coastal sensitivity to sea-level rise is shown in Figure 12. The provincial departments of Environment and Natural Resources and the Université de Moncton are collaborating on a project to develop a decision support tool for coastal communities to adapt to sea-level rise and coastal erosion. Participating communities in this project are Le Goulet, Shippagan and Bas-Caraquet (Bérubé pers. comm. 2012). The increasing rate of sea-level rise is expected to have a strong effect on coastal habitats such as beaches, dunes and salt marshes (Robinson 2010). The erosion of peat cliffs and the inundation of backbarrier marshes can also be expected as a result of sea-level rise (Shaw et al. 1998). One of the major consequences of climate change in New Brunswick is the acceleration of coastal erosion rates, particularly during storm events. (Bérubé 2008). The rate of erosion along the coast between Miscou

Island and Miramichi is the fastest in the province, often reaching over one meter per year (Bérubé pers. comm.). Storm surges such as the event experienced in December 2010 seem to be occurring more frequently (Bérubé pers. comm. & D. Roy pers. obs.). Evidence suggests that the severity of storms and erosion resulting from these storms has dramatically increased (Environment Canada 2006). Severe winter storms in 2010 had major impacts on much of the NB shoreline (Bérubé, Rock pers. comm. & D. Roy pers. obs.).

The increased rate of sea level rise and erosion can affect the breeding habitat of Piping Plovers both negatively and positively (Environment Canada 2006). Piping Plover breeding pairs are known to occupy new sites in habitat created by winter storms, ice scour and tidal surges, among other causes; however, increased severity of summer storms due to climate change can flood nesting sites (Environment Canada 2006, Rock, pers. comm. 2011).

With regards to other species also impacted by such changes, Maritime Ringlet caterpillars (larvae) spend 90% of their life in the marsh litter and as such can tolerate salt water but exposure beyond 24 to 36 hours during events such as storms will result in mortality (G. Godin pers. comm.).

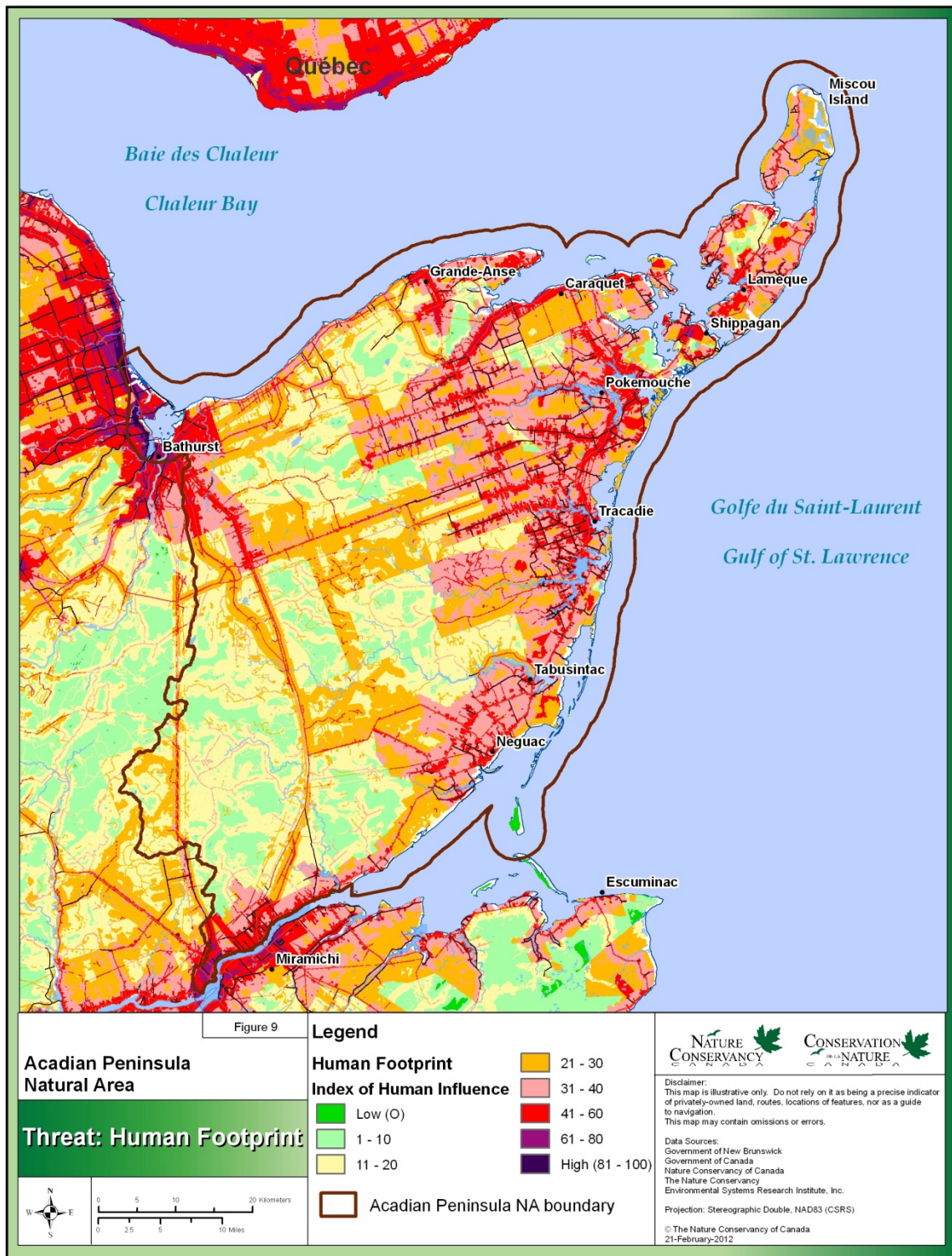


Figure 12. Overall index of anthropogenic impacts on species and habitats within Acadian Peninsula Bioregion.

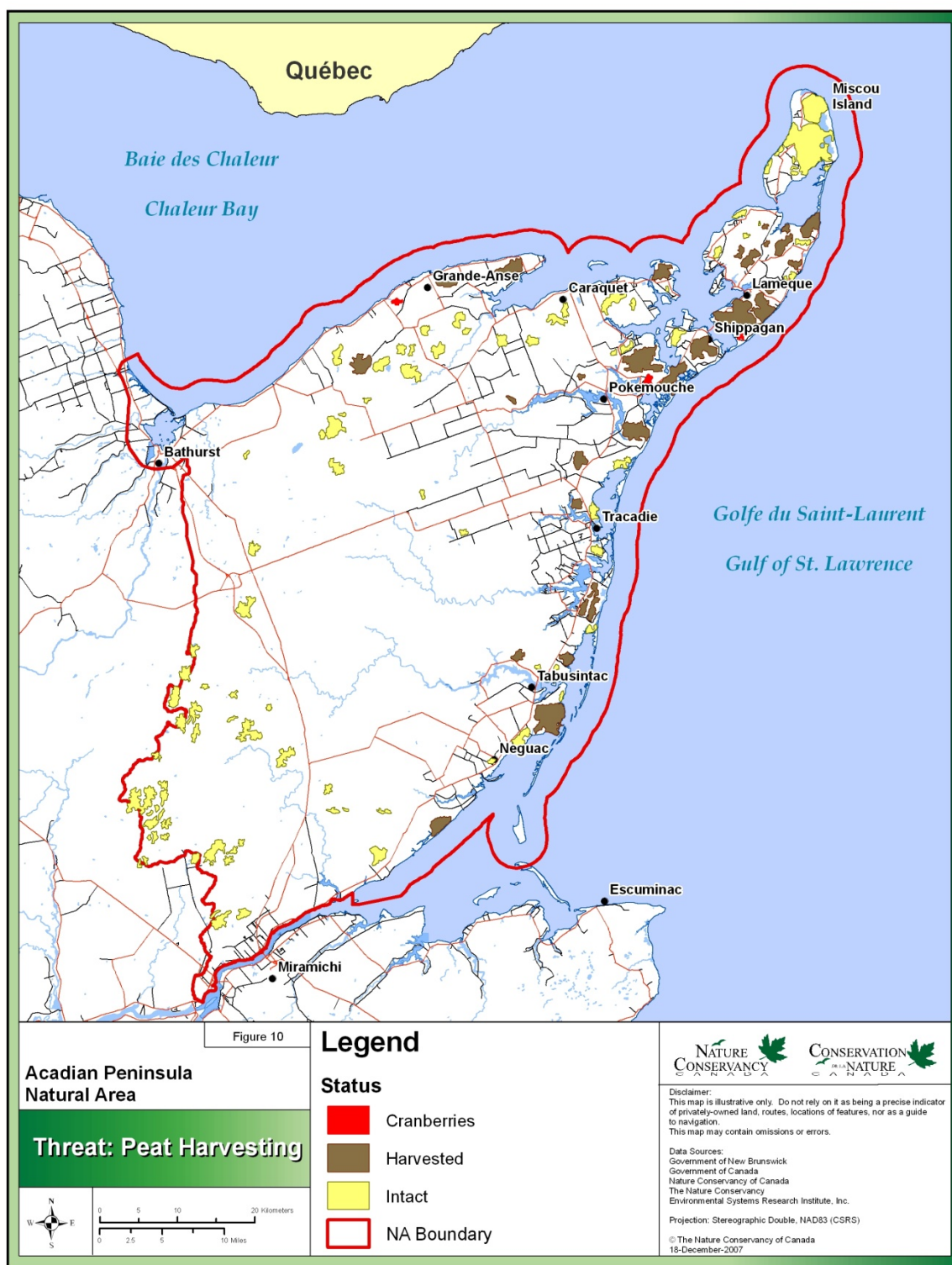


Figure 13. Areas of peat harvesting within Acadian Peninsula Bioregion.

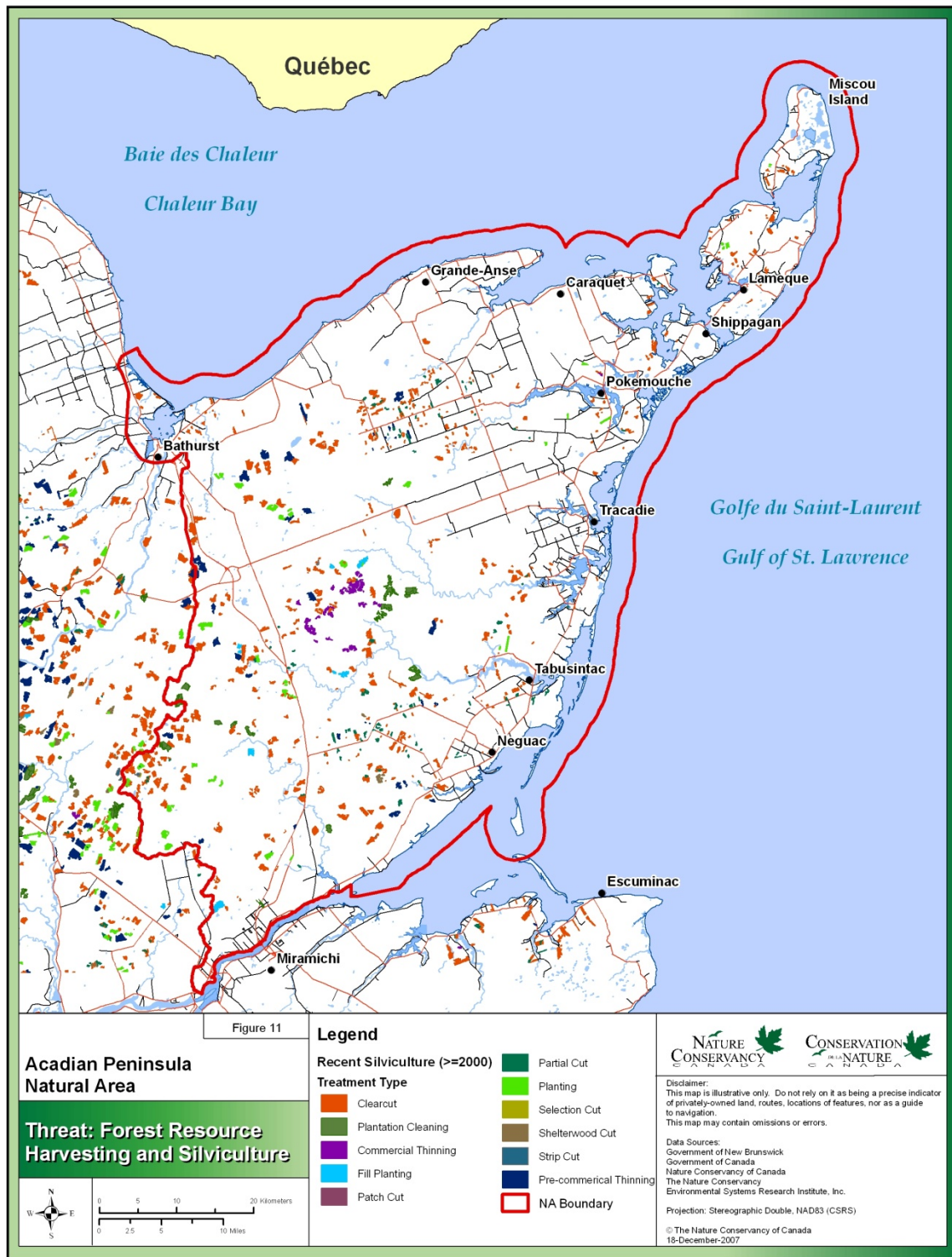
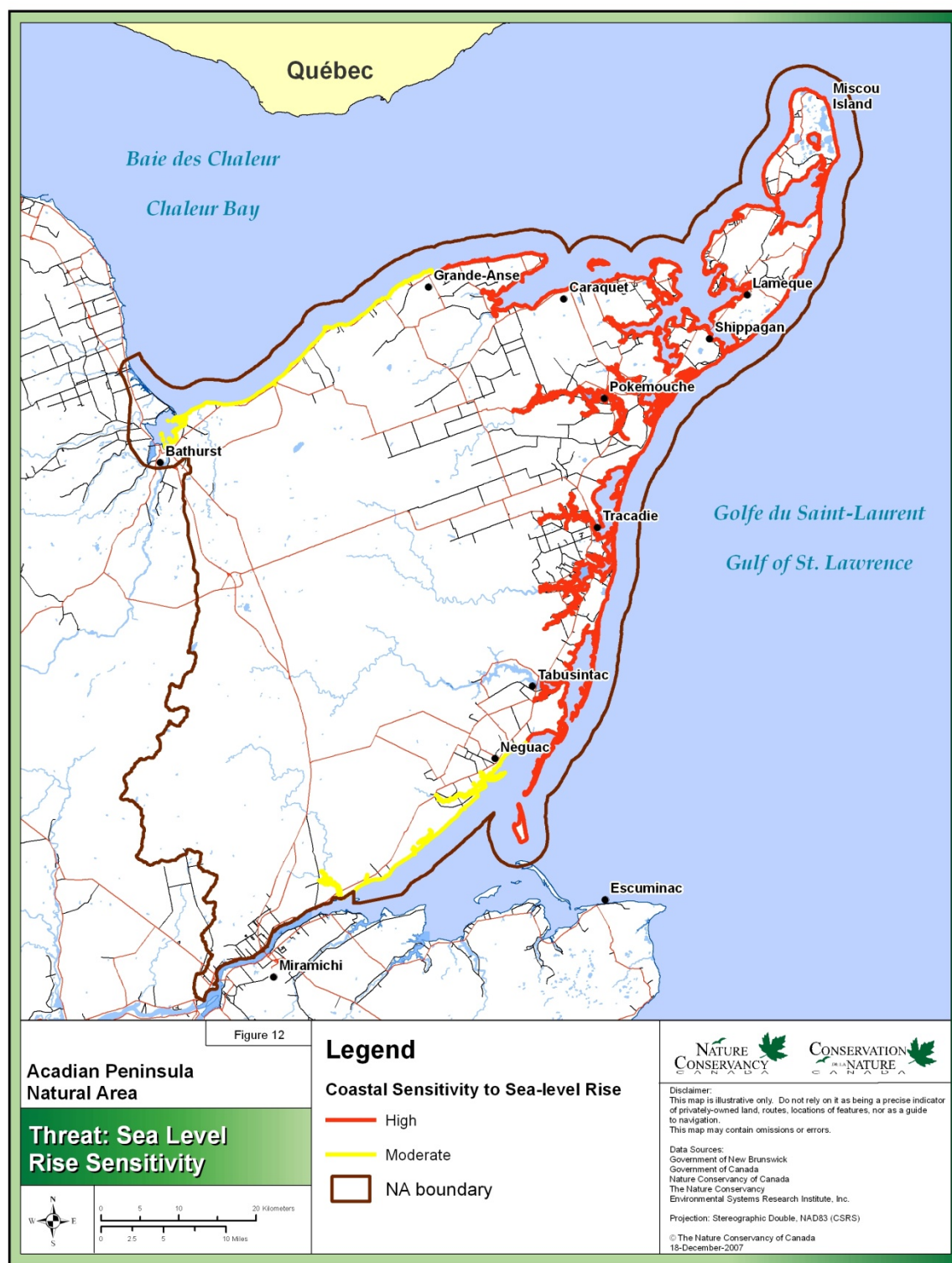


Figure 14. Location of forest resource harvesting and silviculture within Acadian Peninsula Bioregion.



ii. Emerging Threats

Though not discussed in Table 9, with the exception of sea-level rise impacts on the coast, climate change may have far reaching impacts on all priority habitat types in the Bioregion. The potential growth rate of eight Acadian forest tree species in the future under a changing climate will increase for some species (growth rate of Eastern Hemlock is predicted to increase by 60% by 2100), while other species are expected to decline (Eastern White Cedar growth rates are predicted to decrease by 75% in the same timeframe) (Phillips and Laroque 2007). Climate change effects on tree growth rates will be complicated by other factors such as changes in insect populations and new invasive species introductions, also related to or exacerbated by a changing climate.

Terrestrial invasive species have not been reported to be a threat to ecosystems or species in the Bioregion to date.

3. CONSERVATION STRATEGY

A. VISION

As illustrated in part by the Human Footprint Index (Figure 14), the Acadian Peninsula is one of the least disturbed and sparsely populated areas of New Brunswick. As such, the Acadian Peninsula Bioregion still supports healthy populations of many common but also several rare and endemic species. The ecological diversity of salt marshes, beaches and dunes, freshwater wetlands and forests benefit from careful land-use practices and activities that promote the responsible enjoyment of the abundant birdlife and other natural features of the area. Resource industries and agriculture are balanced with the needs of wildlife, including grassland birds. A sense of community pride throughout the area has been fostered through stewardship and conservation activities that focus on the preservation of the natural beauty and ecological richness of this special place.

The habitat conservation vision for the Acadian Peninsula Bioregion is that its ecosystems continue to function in a manner that supports self-sustaining wildlife populations and human communities.

B. GOALS

Table 10. Strategic Conservation Goals for Acadian Peninsula Bioregion.

Conservation Strategic Goals	Allied Habitat Priority ¹
1. <i>To maintain ecological integrity of coastal systems, freshwater wetlands and significant forests.</i>	ALL
2. <i>To advance and support conservation partnerships in the Acadian Peninsula Bioregion.</i>	ALL
3. <i>To maintain existing populations of Species at Risk and protect essential habitat for these species.</i>	ALL

¹ Habitat Conservation Priorities: BD: Beaches and Dunes, SM: Salt Marshes, FW: Freshwater Wetlands, FM: Forest Mosaic, CI: Coastal Island, G: Grasslands.

C. OPPORTUNITIES

Historically colonized by the Acadians whose economy was based on fishing and farming and other resource-based industries, the local economy in the Acadian Peninsula is now in transition as revenues from these resource-based industries are less wide-spread and new opportunities in manufacturing and service industries are being sought. Despite its unique culture and its natural riches that include kilometres of sandy beaches and the remarkable natural beauty of the area, the region has yet to achieve real financial success as a tourism destination. Land prices in the Acadian Peninsula are below those in other coastal regions of the Maritimes.

Land has been donated in the past to EHJV partners from private donors in the Acadian Peninsula. Given the low land values relative to other regions and the slow real estate market, the idea of donating land may be favorably received, particularly by landowners who no longer live on the Peninsula. As of winter 2012, EHJV partners are in the process of undertaking four separate land donation projects in the Miscou Island, Grand Passage and Neguac areas. Land prices have also worked against the donation of

land in recent years with local landowners adopting a “wait and see” position, preferring to hold on to their land in the hopes that prices will rise as they have in other coastal regions.

EHJV partners have been active in the Acadian Peninsula Bioregion for a number of years and successful partnerships and contacts have already been established. In addition to land securement, EHJV partners have undertaken significant stewardship work at the Tabusintac Estuary. Activities here have included the negotiated removal of 20 squatters’ shacks from NCC land, presentations by NCC to various local groups, an annual Conservation Volunteers event, and participation in the Tabusintac “Old Home Week” festival which occurs every five years and includes a large community picnic on an NCC owned beach property.

EHJV partner agencies have met with the Tabusintac Watershed Association and Tabusintac Economic Development Corporation to discuss the advantages of conservation and healthy natural systems to communities. The opportunity exists to increase the EHJV’s profile in other communities in the Acadian Peninsula Bioregion through similar presentations and partnerships with watershed groups, hunting/fishing groups, First Nations community members, community economic development agencies, and ATV clubs.

Local communities are becoming increasingly sensitized to the importance of natural coastal systems, particularly in relation to the erosion control and storm surge protection roles provided by barrier beach / salt marsh complexes. This awareness has come in large part from climate change adaptation programs initiated by the New Brunswick government. These programs involve municipal and rural councils and planners. They focus on creating zoning and development plans which account for increasing severe weather and rising sea levels, and the resulting storm surges and damage to coastal infrastructure occurring on the east coast of New Brunswick (Acadian Peninsula and NB Northumberland Strait Bioregions). EHJV partners have an opportunity to reinforce the message of the benefits of natural shorelines in all communications with communities.

The provincial government has committed to increasing the amount of crown land in the province designated as Natural Protected Area by 3% to between 6% and 8%. Consultations were held during the fall of 2012 on proposed PNAs. At this time, there is a particular opportunity to protect forest in the Bioregion, which is currently unrepresented in the existing PNA network, and to formalize the protection of the expansive peatlands on Miscou Island which have never been harvested. The peat producers of the area are committed to support a recommendation to prevent the harvesting of peat from the bogs on Miscou Island (J. Thibault pers. comm. 2011).

A key conservation partner in the Bioregion is Nature NB, which has one full time staff and additional contract staff in the bioregion working on Species at Risk programming. Nature NB’s objectives are to protect and educate the public about Species at Risk, especially the Piping Plover. Nature NB staff has been conducting Piping Plover surveys throughout the bioregion. They also deal with a wide variety of stewardship issues within the Acadian Peninsula and work to educate and involve local communities in the protection of Species at Risk and their habitats.

D. ACTIONS

This section identifies the conservation actions required over the next five years to conserve the Acadian Peninsula Bioregion's priority habitats. It also establishes measures for evaluating the success of these actions. Developing and implementing measures of success allows an adaptive management approach to be applied to the Acadian Peninsula Bioregion. Table 11 provides four strategic conservation actions, whereas Table 12 provides 17 detailed conservation actions to be implemented through this Habitat Conservation Strategy. The relative importance of each conservation action has been indicated, utilizing the following definitions:

Table 11. Strategic Conservation Actions for Acadian Peninsula Bioregion.

Strategic Conservation Actions	Allied Habitat Priority¹
<i>1. Securing land and building on existing conservation work by EHJV partners, and others, in order to maximize impact on landscape.</i>	ALL
<i>2. Advancing and supporting conservation partnerships in the Acadian Peninsula Bioregion.</i>	ALL
<i>3. Maintaining existing populations of Species at Risk and protect essential habitat for these species.</i>	ALL
<i>4. Applying adaptive management principles to the Bioregion's conservation of biodiversity, natural processes and threats on conserved lands.</i>	ALL
<i>5. Supporting ecotourism and public land management initiatives to have minimal impacts on the Bioregion's biodiversity targets</i>	ALL
<i>6. Advancing community support and awareness for conservation of sensitive ecosystems throughout the Acadian Peninsula Bioregion.</i>	ALL

¹ Habitat Conservation Priorities: BD: Beaches and Dunes, SM: Salt Marshes, FW: Freshwater Wetlands, FM: Forest Mosaic, CI: Coastal Island, G: Grasslands.

This section identifies the conservation actions required over the next five years to conserve the Acadian Peninsula Bioregions priority habitats. It also establishes measures for evaluating the success of these actions. Developing and implementing measures of success allows an adaptive management approach to be applied to the Acadian Peninsula Bioregion. Table 8 provides a summary of the 17 conservation actions to be implemented through this Habitat Conservation Strategy. The relative importance of each conservation action has been indicated, utilizing the following definitions:

Previous work on habitat conservation through fee simple acquisition in this region has not been as successful as originally anticipated. Many landowners, although receptive to discuss conservation of habitat, were not interested in selling. The low appraised value of coastal lands in the Bioregion, causes many landowners to decide to 'wait and see' on hopes that their properties will increase in value over time. Conservation in coastal areas tends to involve securement of important but relatively small properties, which means the amount of conserved lands accumulates slowly. The majority of land securement by NCC will be within the nine delineated focal areas. EHJV partners may also be able to strategically acquire forest habitat to enlarge existing provincial protected areas.

Critical: Conservation actions that without implementation would clearly result in the reduction of the ecological integrity of a priority habitat or an increase in magnitude of a critical threat within the next 5-10 years. Also includes research information that is needed before key decisions can be made on the management of priority habitats.

Necessary: Conservation actions that are needed to maintain or enhance the ecological integrity of priority habitats or reduce critical threats. Also includes research that will assist in decisions on management of priority habitats.

Beneficial: Conservation actions that will assist in maintaining or enhancing ecological integrity of priority habitat and reducing threats.

Prioritisation of land for conservation is mapped in Figure 16 and the methodology underlying this parcel-level prioritization is presented in Appendix D. Focal areas were identified as priorities for conservation activity to strategically achieve the conservation goals for the larger bioregion and are mapped in Appendix E. The nine focal areas where conservation activity will be targeted are:

- Bass River
- Caraquet Bay
- Saint Simon Bay
- Miscou Island
- Inkerman Ferry
- Tabusintac
- Neguac
- Pokesudie Island
- Tracadie Bay

It is anticipated that new Protected Natural Areas designations within the Acadian Peninsula Bioregion will make an important contribution to habitat conservation, protecting up to 12,000 ha of habitat, mainly forest and freshwater wetlands. Fee simple acquisition will also have an important role to play, particularly in protecting coastal habitats, where there is little Crown Land. Fee-simple acquisition involves obtaining the full bundle of rights associated with a parcel of land. It is the way that real estate is owned in common law countries, and is the highest ownership interest possible that can be had in real property. Preserving the natural capacity of coastal systems to migrate landward as the sea-level is rising is extremely important for their persistence (Bérubé 2008). While coastal marshes and beaches are often targeted for conservation, there must be equal emphasis placed on the uplands surrounding these systems (Webster et al 2013). It will be important to maintain a buffer of natural habitat around coastal systems so they can migrate inland over time. NCC will secure another 182 ha in the bioregion (a 10% increase over existing protected lands). In all, it is expected the amount of protected land in the Acadian Peninsula Bioregion will increase by 86% over the implementation timeframe of this strategy.

It is recognized that long-term strategies are required to manage human activities in the coastal zone and maintain coastal processes in order for species-specific recovery efforts to be successful (Goossen et al. 2002). Land securement can be an effective approach to dealing with coastal development/shoreline hardening. By owning the land, residential building and associated shoreline hardening can be prevented. The provincial coastal lands policy and education and outreach on climate change adaptation are trying to encourage voluntary compliance with recommended setbacks for development in coastal areas and avoiding coastal hardening. Species and habitats will be positively influenced by stewardship and communications actions and community engagement will help to abate threats to targets in the Bioregion. By working with local landowners and with other conservation organizations

such as Nature NB, NCC will influence stewardship actions on an additional 1,900 ha of habitat in the Bioregion.

Securement of lands supporting the forest mosaic target will likely be opportunistic over the next five years, especially where doing so will expand on existing provincial protected areas.

Survey information, conservation status and habitat dependency differs across the broad range of priority species included in calculating the overall Conservation Value Index. To address this issue, composite maps were also calculated for a number of subsets of the full list of significant species (Figures 17-27).

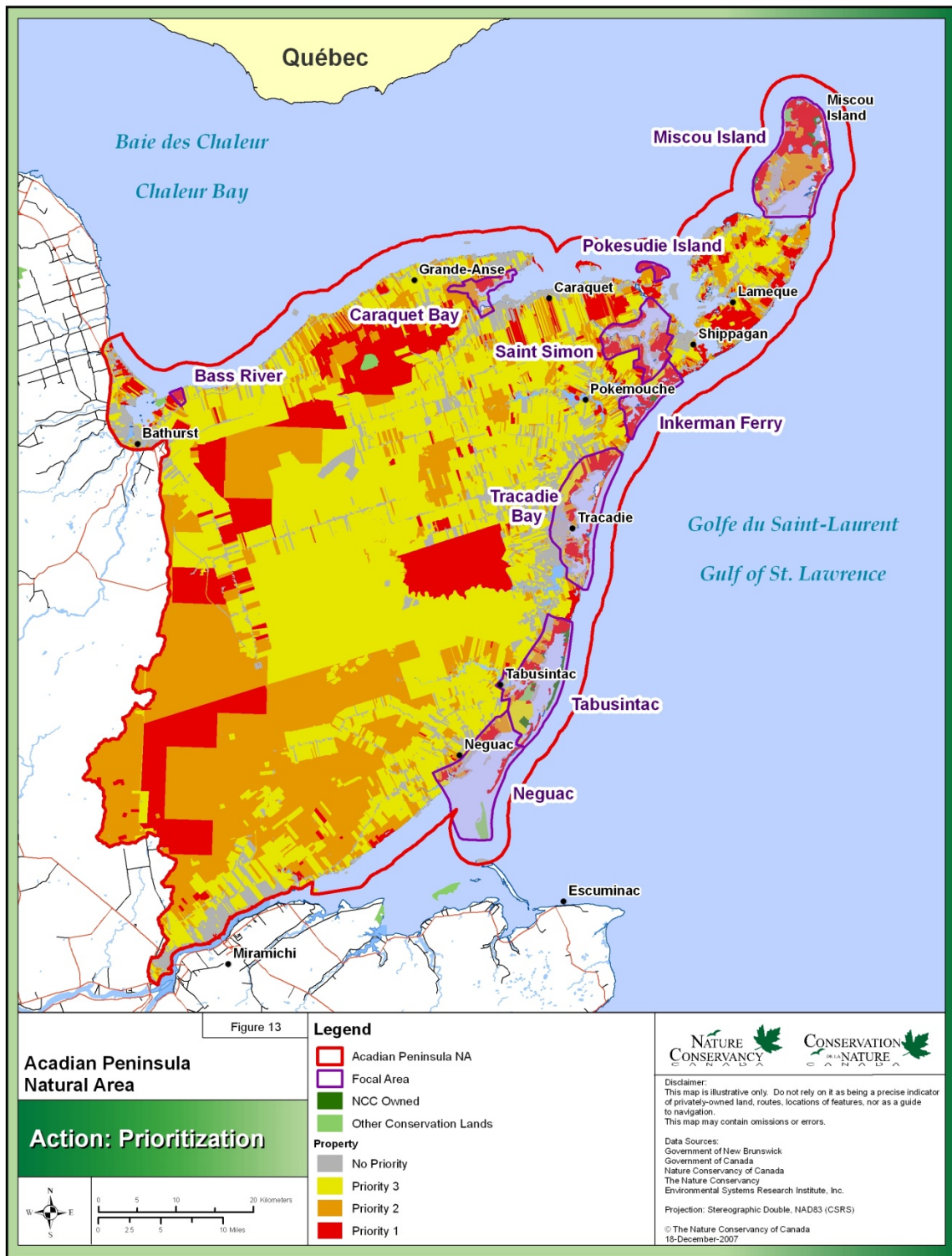


Figure 16. Areas of high priority for conservation actions within Acadian Peninsula Bioregion.

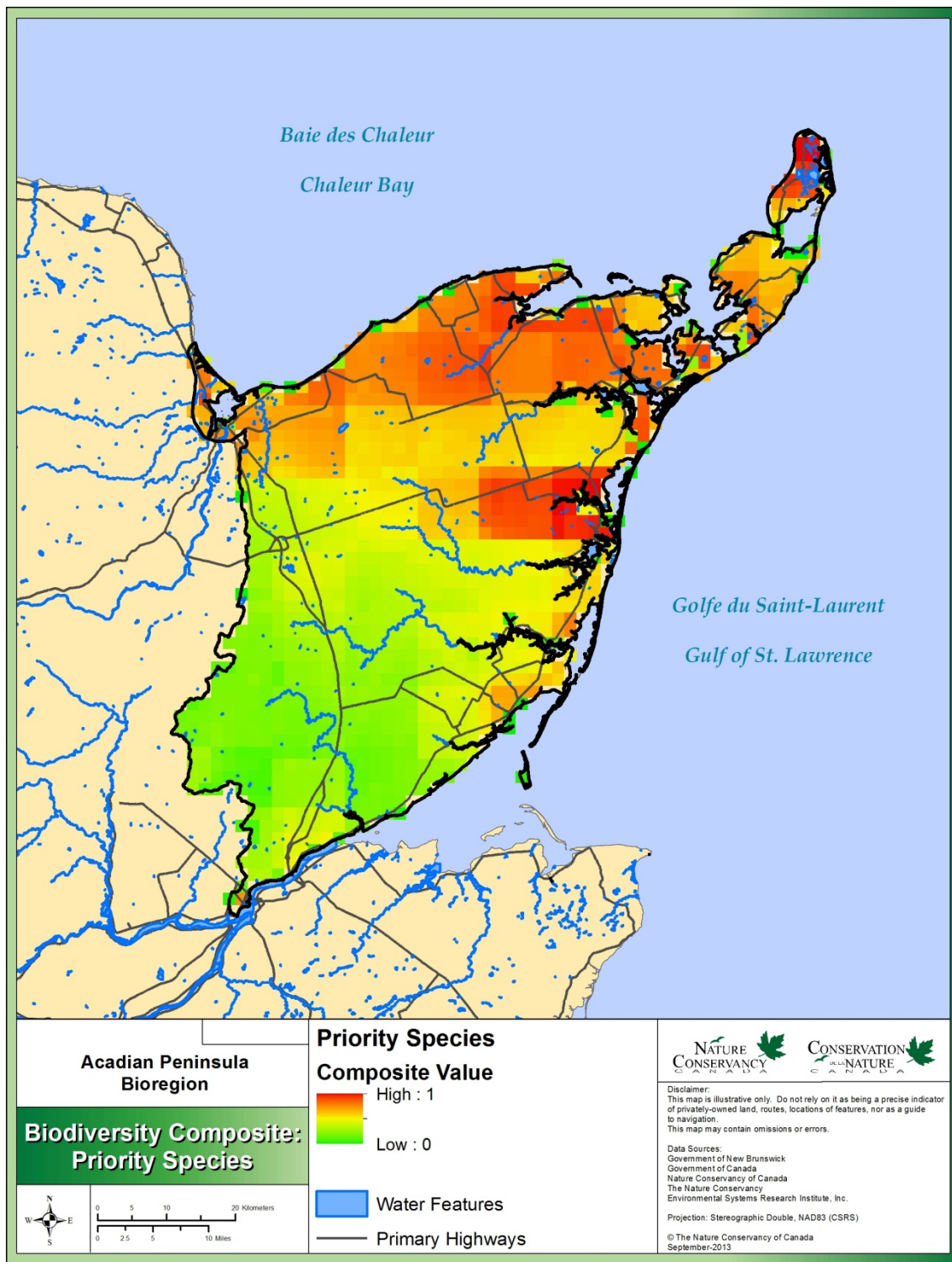


Figure 17. Species composite for the full list of rare and priority significant species in the Acadian Peninsula Bioregion.

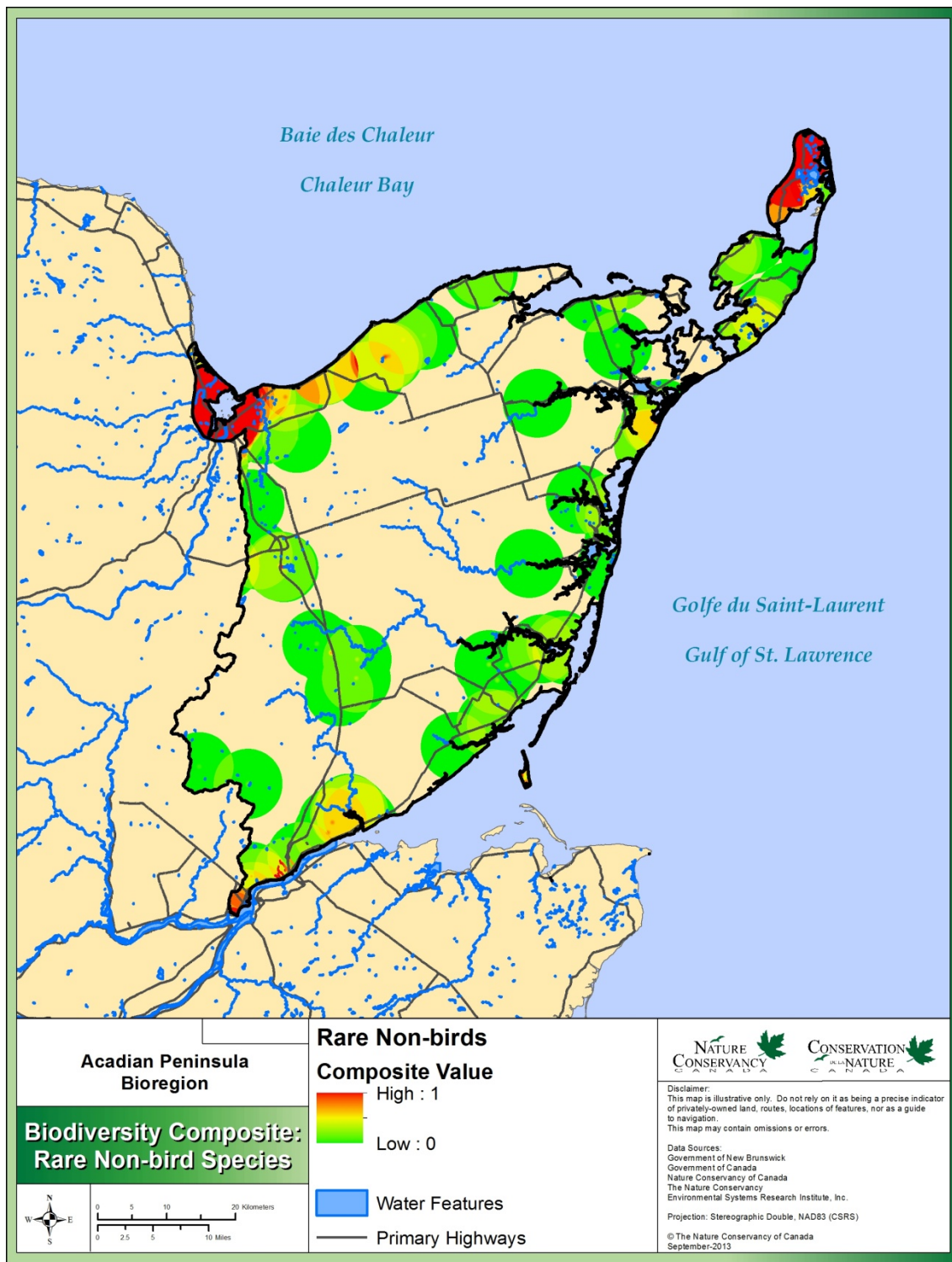


Figure 18. Species composite for rare non-bird significant species in the Acadian Peninsula Bioregion.

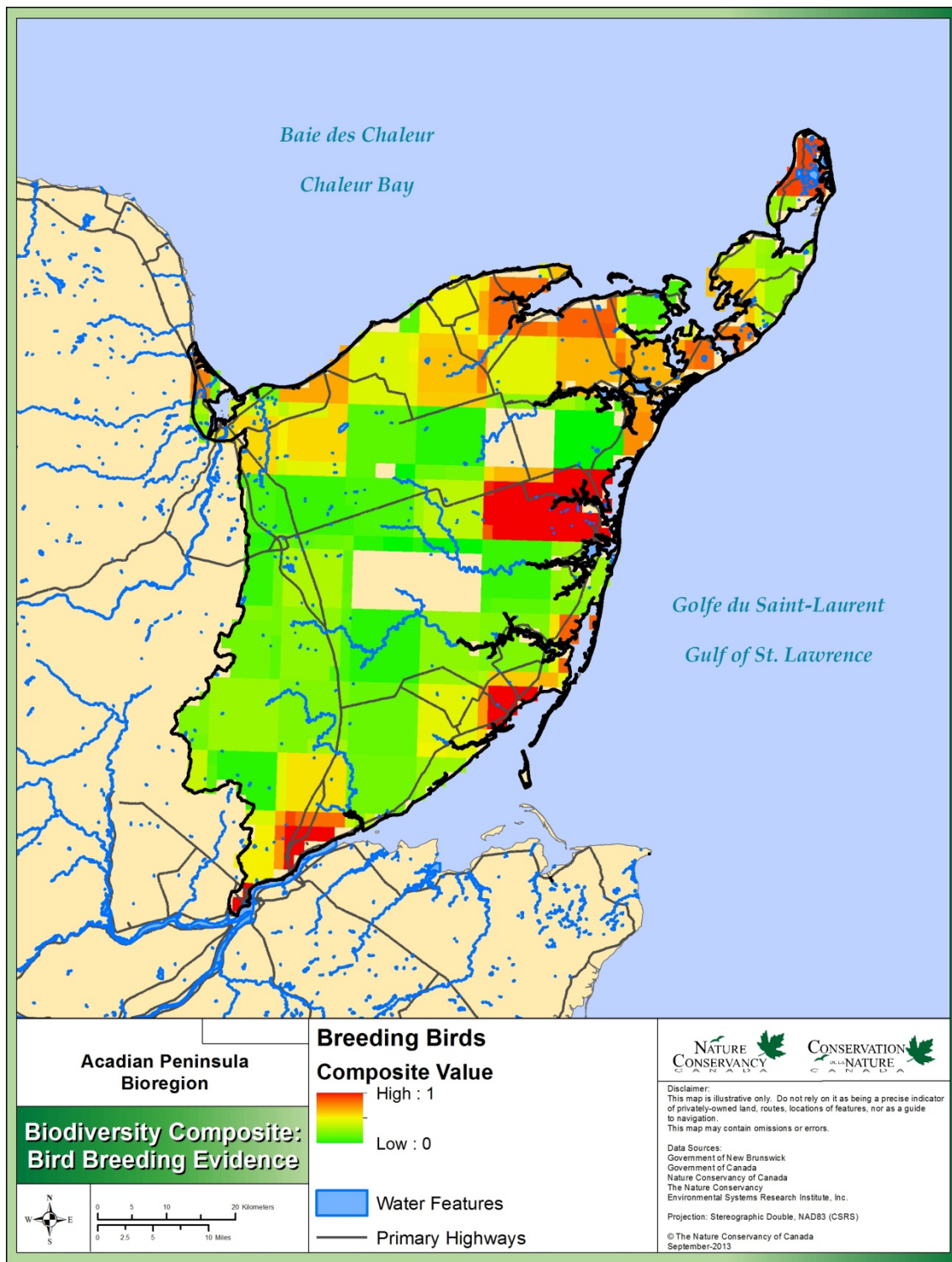


Figure 19. Species composite for rare and priority breeding bird species in the Acadian Peninsula Bioregion.

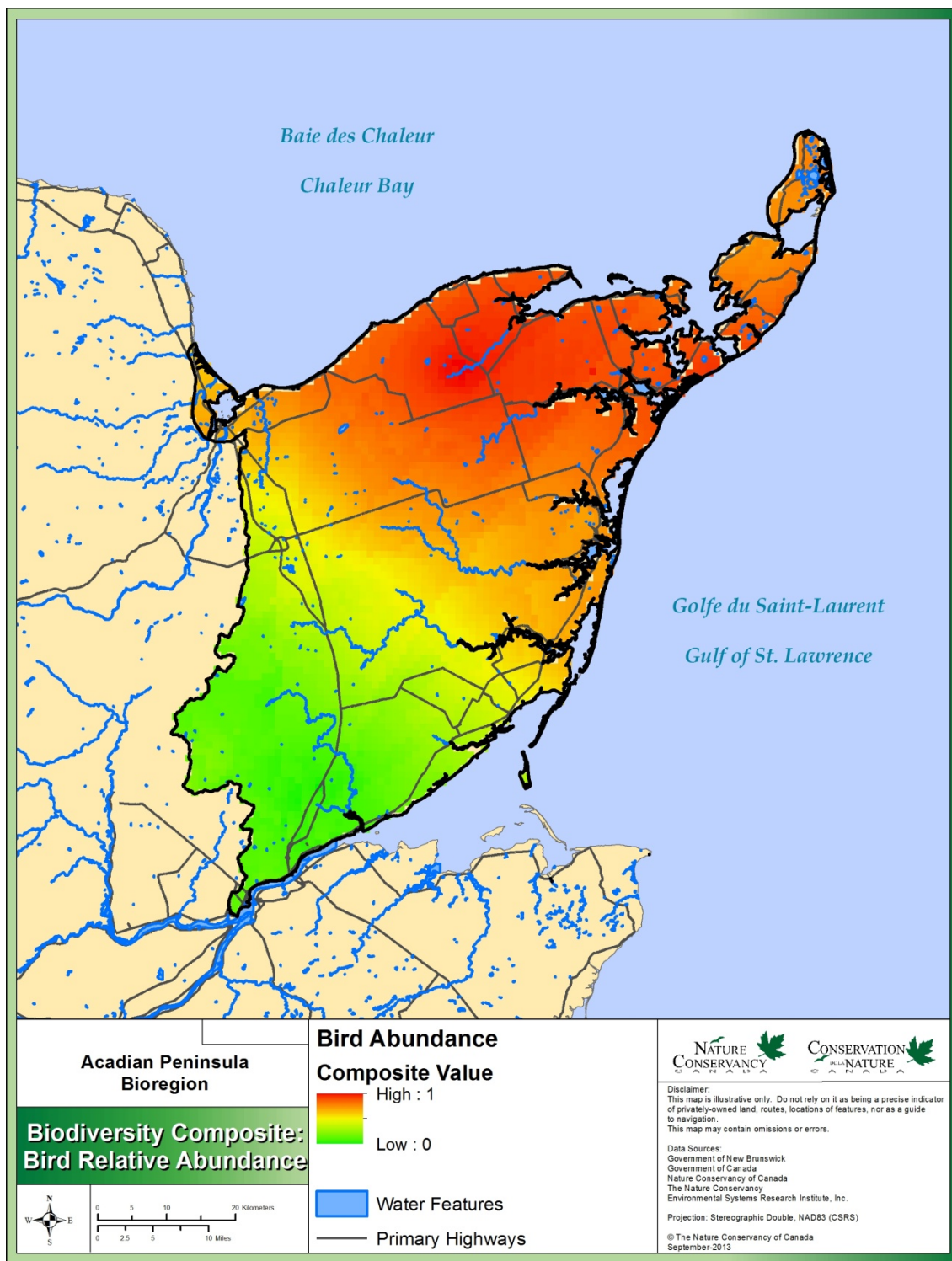


Figure 20. Species composite for rare and priority bird species in the Acadian Peninsula Bioregion (based on relative abundance).

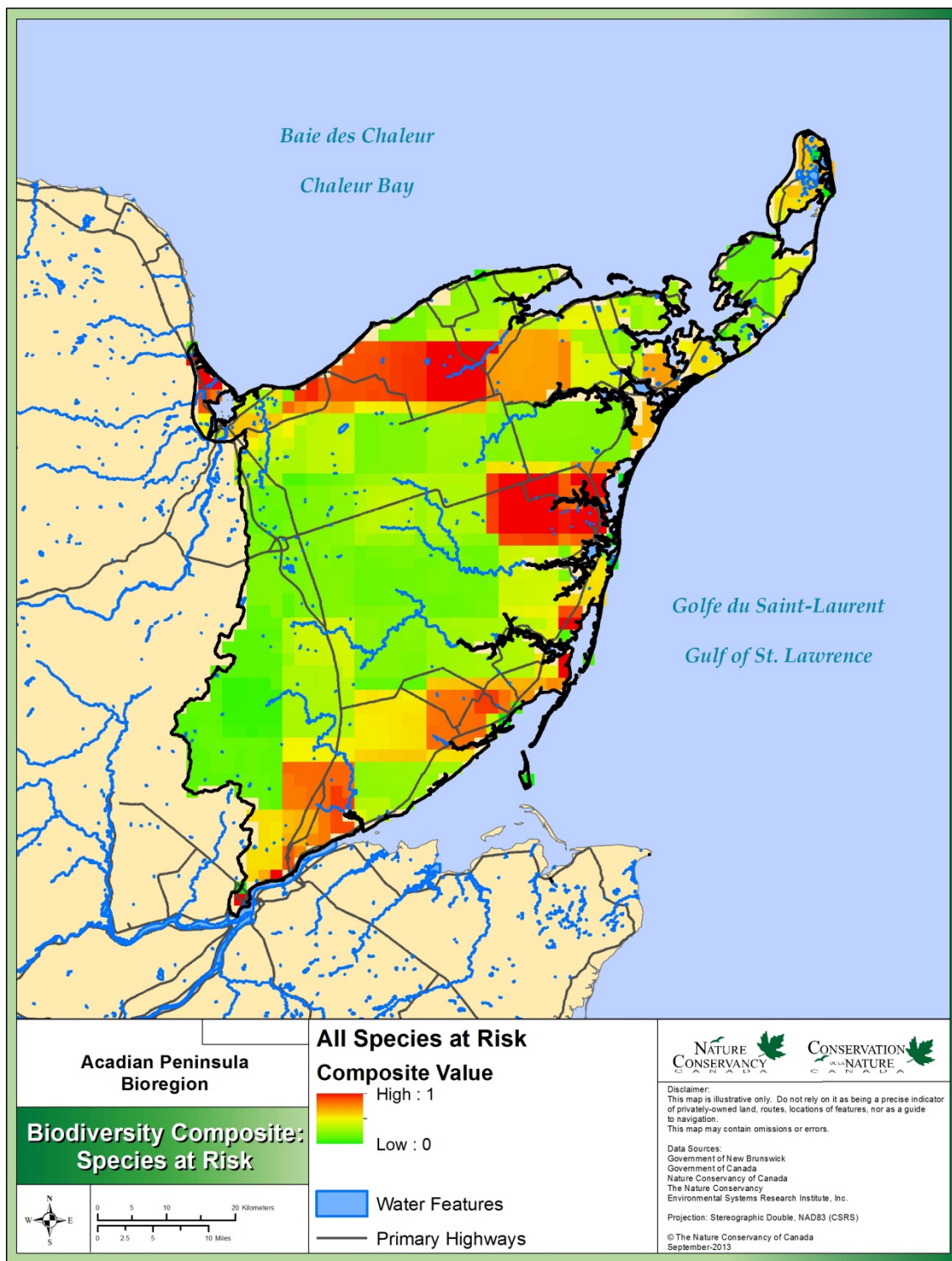


Figure 21. Species composite for species at risk in the Acadian Peninsula Bioregion.

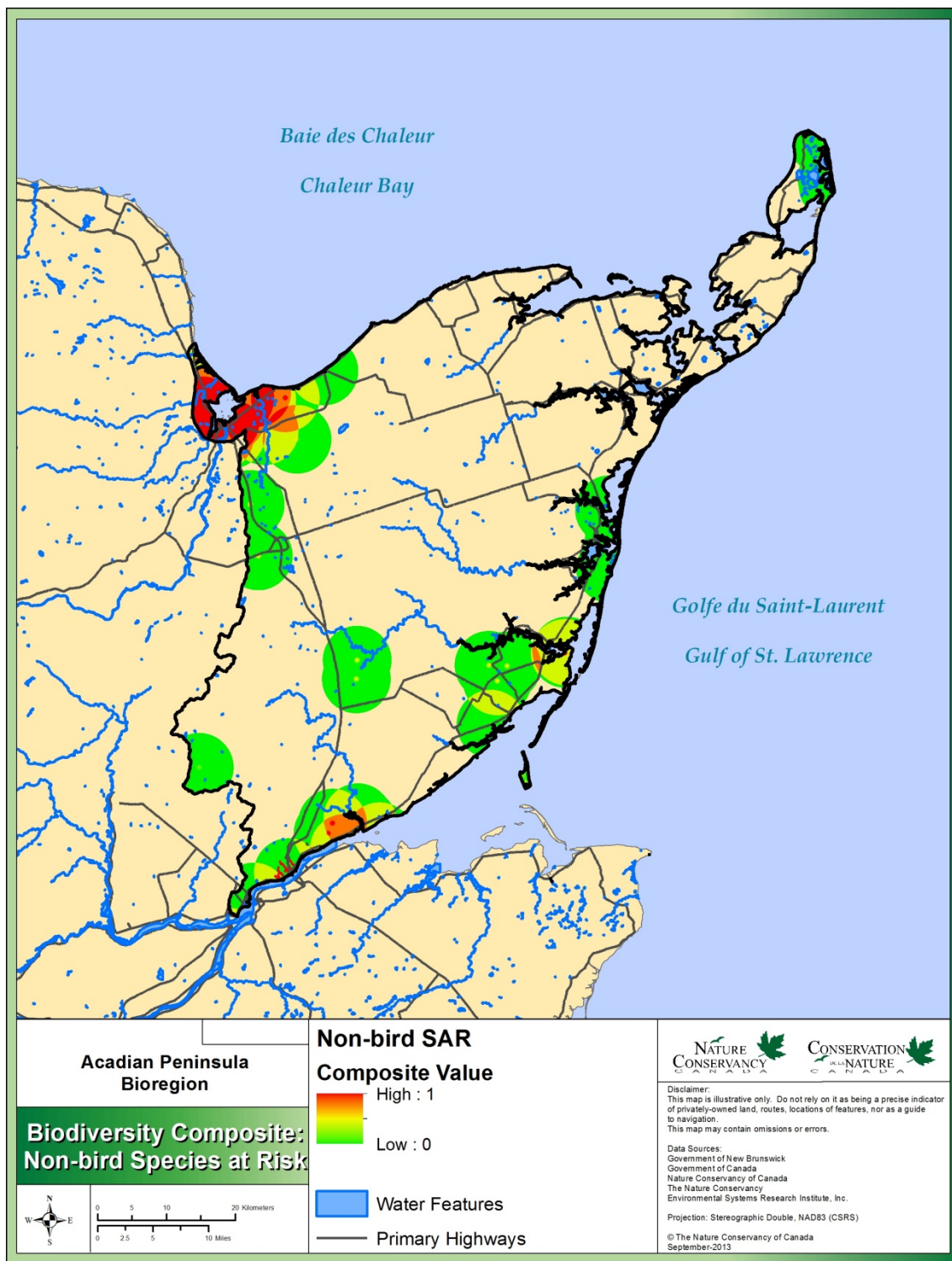


Figure 22. Species composite for non-bird species at risk in the Acadian Peninsula Bioregion.

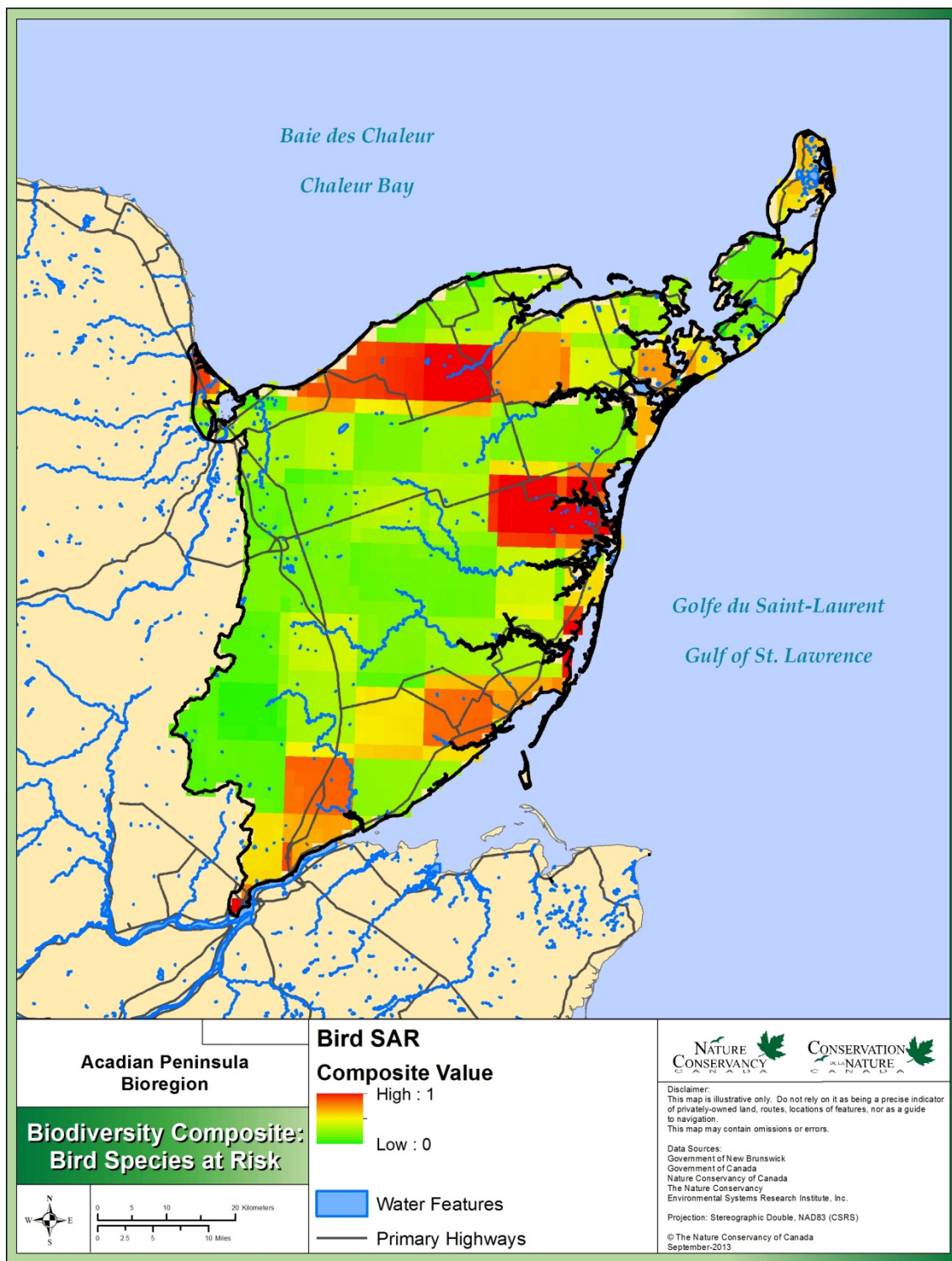


Figure 23. Species composite for bird species at risk in the Acadian Peninsula Bioregion (based on breeding evidence and relative abundance).

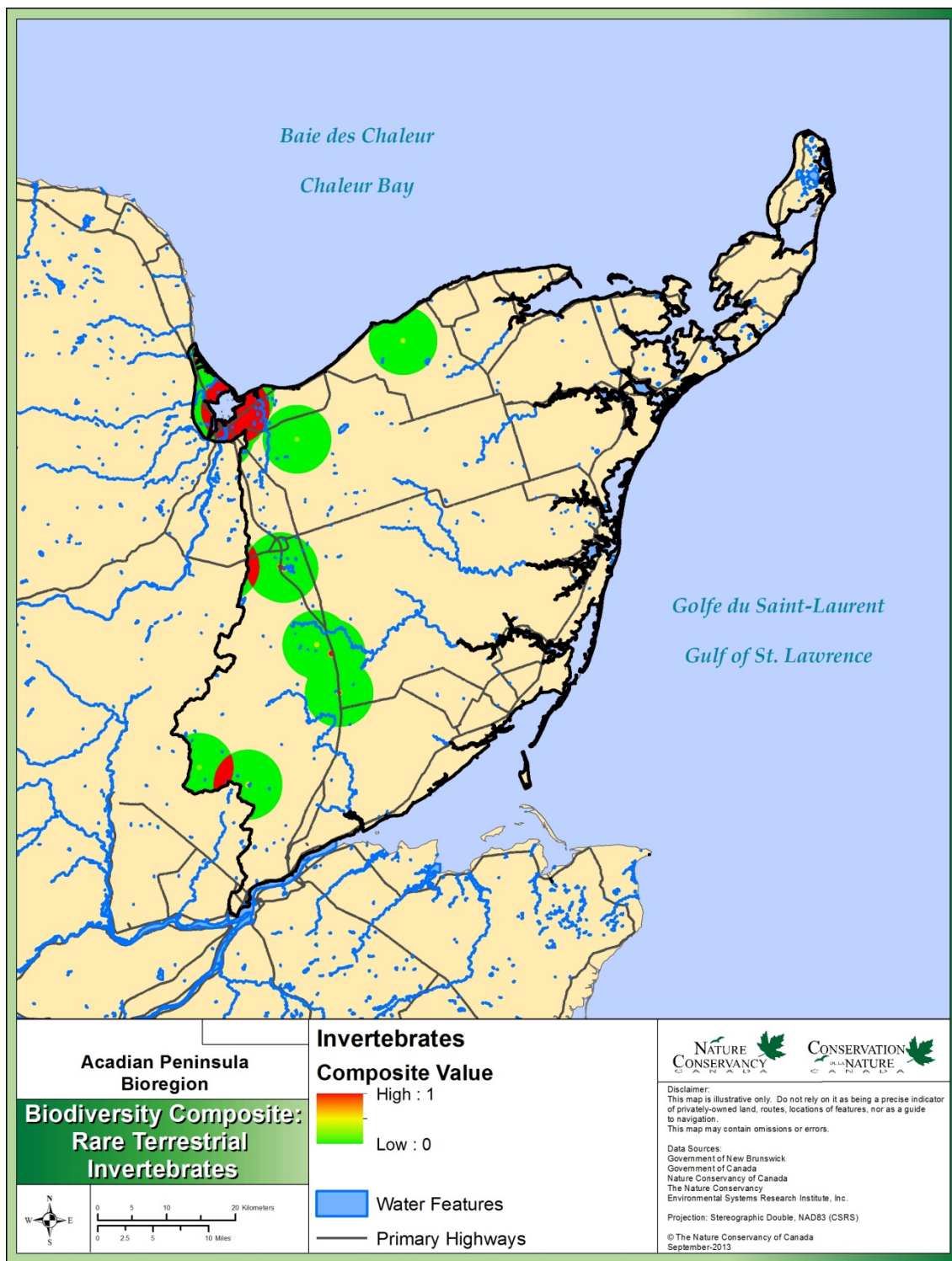


Figure 24. Species composite for rare terrestrial invertebrate species in the Acadian Peninsula Bioregion.

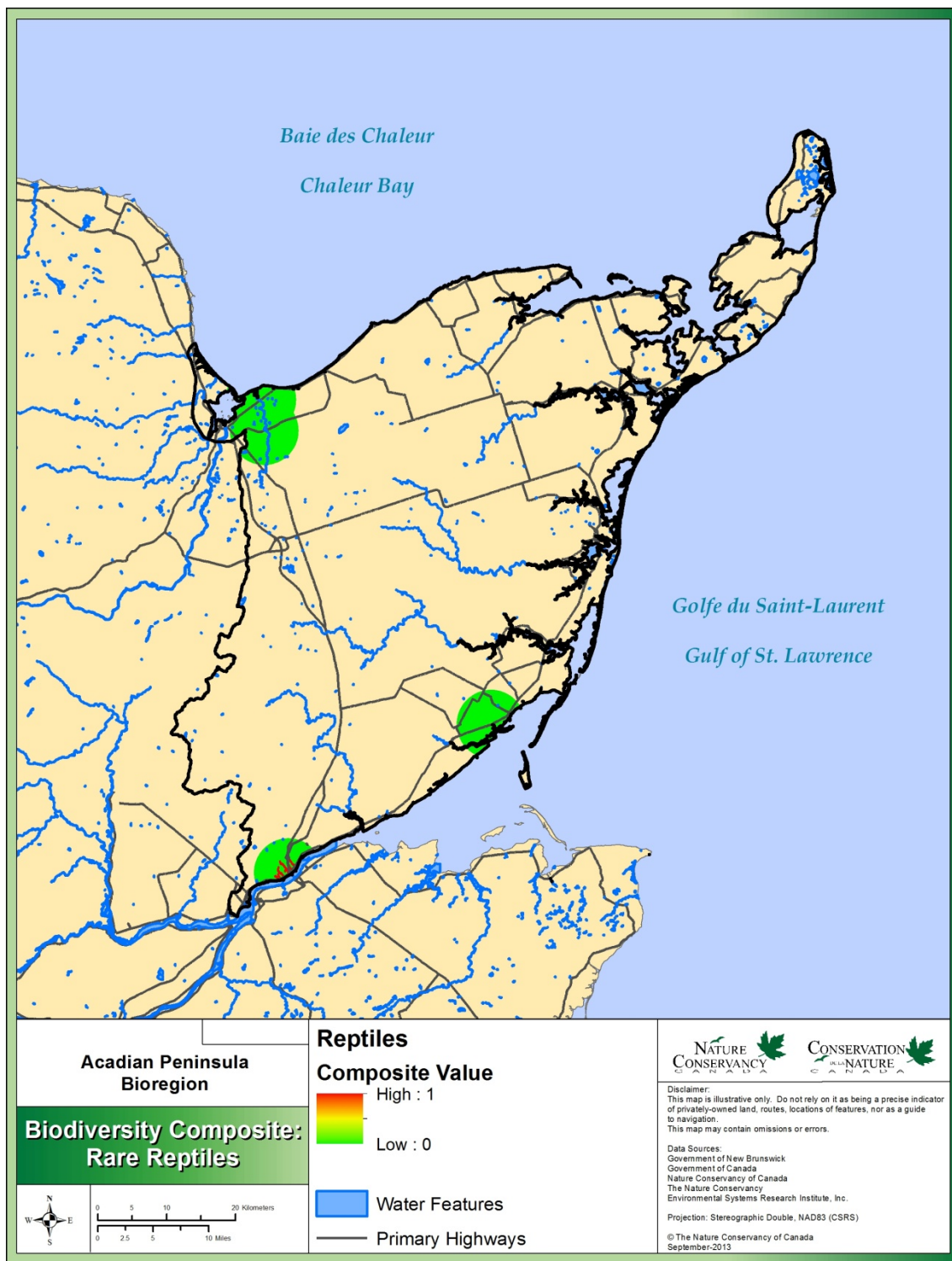


Figure 25. Species composite for rare reptile species in the Acadian Peninsula Bioregion.

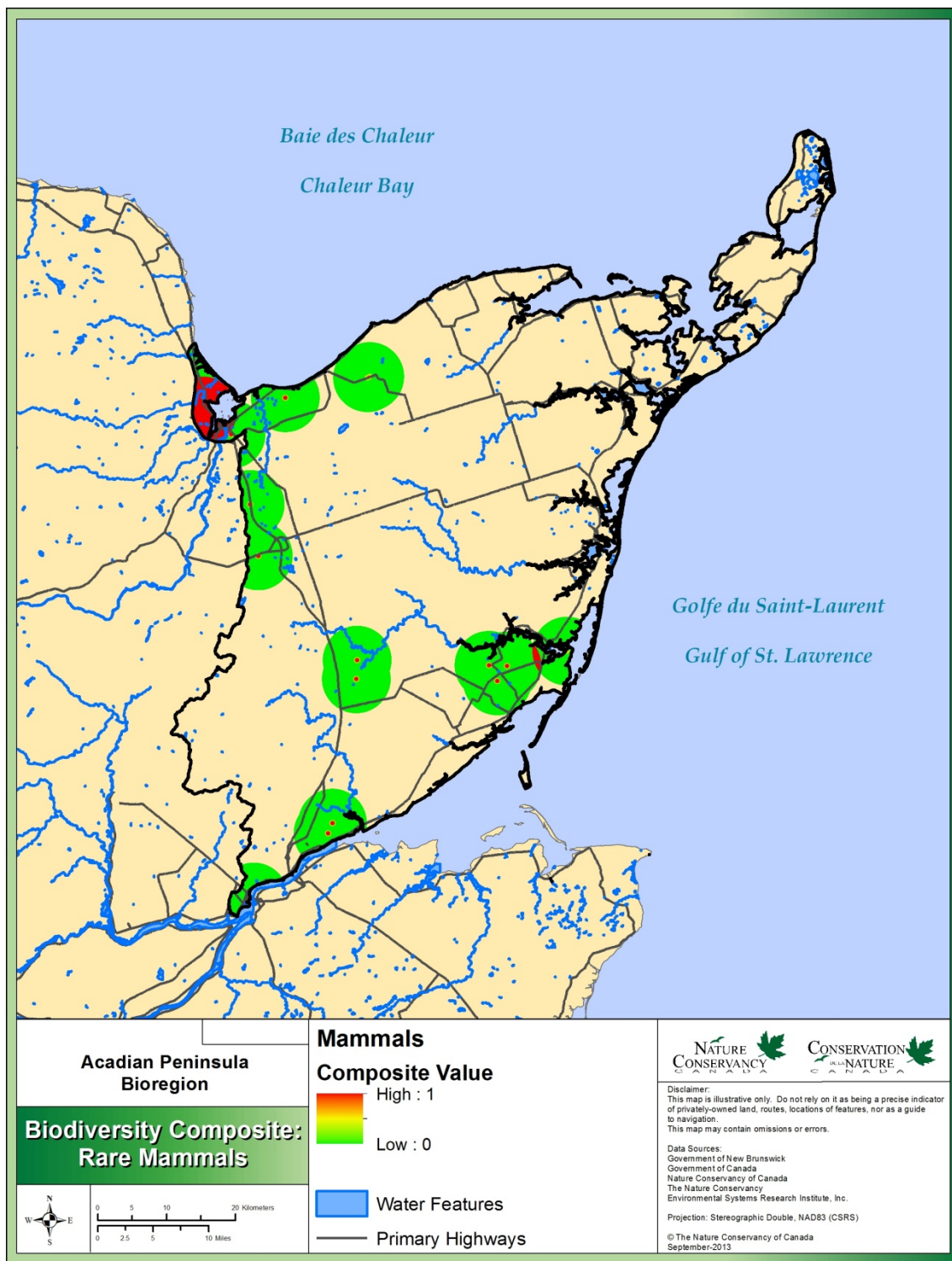


Figure 26. Species composite for rare mammal species in the Acadian Peninsula Bioregion.

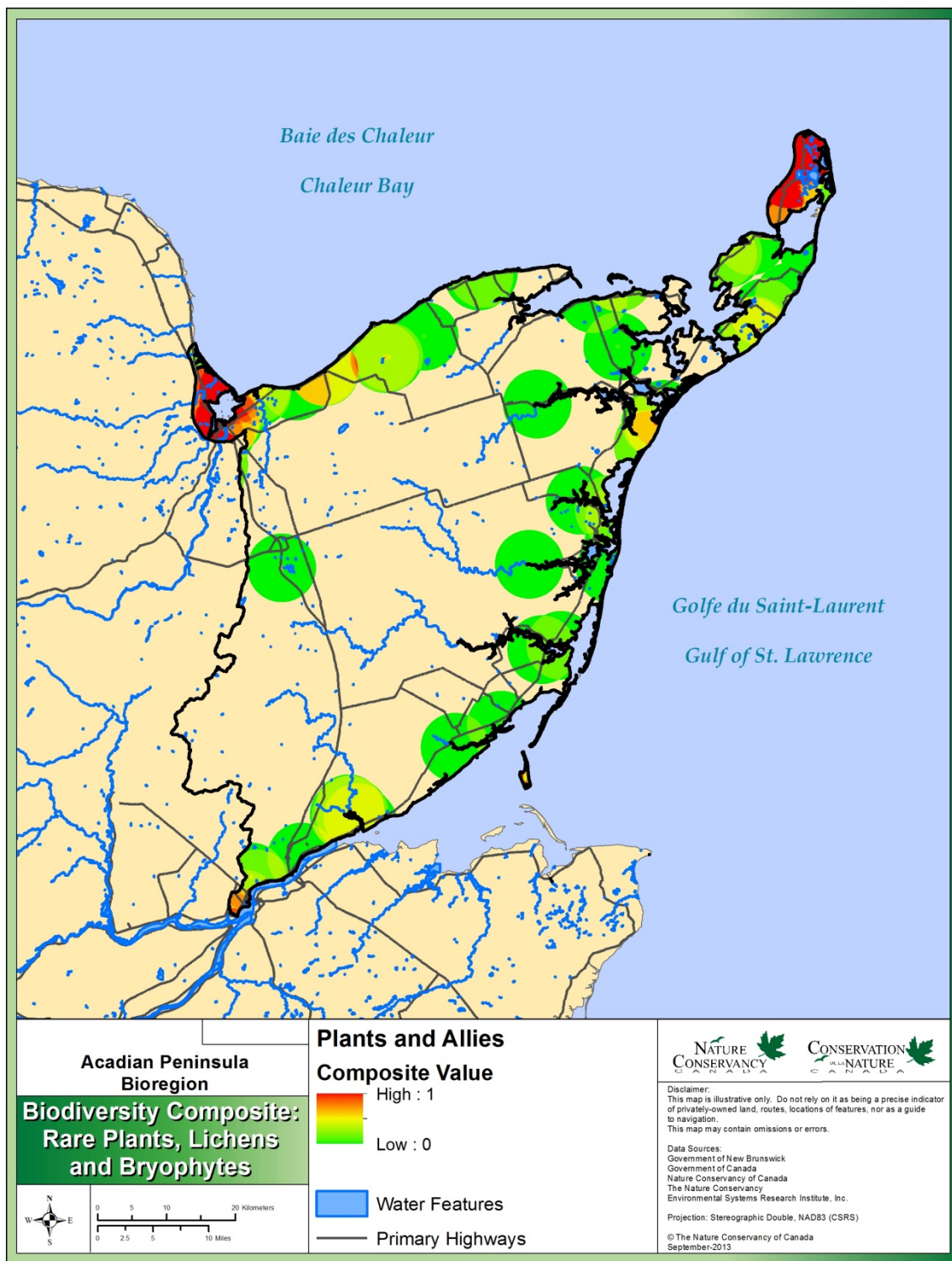


Figure 27. Species composite for rare plants, lichens and bryophytes species in the Acadian Peninsula Bioregion.

Table 12. Detailed Conservation Actions for the Acadian Peninsula Bioregion.

Conservation Actions	Importance/ Associated Goals ¹	Biodiversity Target(s) ²	Threat(s) ³	Measures of Success (MOS) ⁴ / Notes	Partners Identified
1. Securement					
<i>1.1.1 Secure 182 ha of Priority native/natural lands by 2017 of which at least 162 ha are Priority 1 or Priority 2 and no more than 20 ha are Priority 3 or other.</i>	CRITICAL/1, 2, 3, 4, 6	BD, SM, FW, FM, CI	1.1.1, 11.1.1	A minimum of 380 ha of Priority 1 and 2 lands and no more than 20 ha of Priority 3 lands were secured by 2017. All of these being native/natural lands. It is anticipated that the vast majority (> 90% of securement) will be within the nine identified focal areas, to ensure our securement remains strategic and focused on creating large preserves. An exception to this may be if an opportunity comes up to protect Priority 1 or Priority 2 land adjacent to provincial Protected Areas. Grasslands are not targeted for securement. Grasslands are addressed under action 3.1.4.	NCC
<i>1.1.2 Province of New Brunswick to achieve Protected Natural Area designation of up to 12,000 ha of significant habitat on Crown land within the Bioregion by 2015.</i>	CRITICAL/1, 2, 3, 5, 6	FM, FW	2.1.1, 3.2.1, 3.3.1, 5.3.1	Up to 12,000 ha of significant habitat on Crown land was placed under the provincial Protected Natural Areas Act by 2015 including old forest communities and peatlands.	Province of New Brunswick (PNB)

¹ **Critical:** Conservation actions that, without implementation, would clearly result in the reduction of ecological integrity of a priority habitat or the increase in magnitude of a critical threat within the next 5-10 years. Also includes research information that is needed before key decisions can be made on the management of priority habitats.

Necessary: Conservation actions that are needed to maintain or enhance the ecological integrity of priority habitats or reduce critical threats. Also includes research that will assist in decisions on management of priority habitats.

Beneficial: Conservation actions that will assist in maintaining or enhancing ecological integrity of priority habitats and reducing threats.

² Priority habitats: **BD:** Beaches/Dunes, **SM:** Salt Marshes, **FW:** Freshwater Wetlands, **FM:** Forest Mosaic, **CI:** Coastal Islands, **GB:** Grassland Birds.

³ threats: 1.1.1 cottage and residential development; 1.1.2 Squatters on beaches / islands; 1.3.1 Campgrounds; 2.1.1 Cranberry Farming; 2.1.2 Incompatible farm practices; 2.4.1 Marine Aquaculture; 3.2.1 Peat Harvesting; 3.3.1 Wind Farming; 5.3.1 Incompatible Forestry Activities; 6.1.1 All-terrain vehicles; 6.1.2 Recreational Beach Use; 11.1.1 Sea-level Rise and erosion;

⁴ Proposed implementation measures for NACP annual progress report. More detailed measures for some actions will be developed as part of action implementation or through Property Management Plans.

Conservation Actions	Importance/ Associated Goals ¹	Biodiversity Target(s) ²	Threat(s) ³	Measures of Success (MOS) ⁴ / Notes	Partners Identified
<i>1.1.3 Update landowner contact database by adding contacts in new active focal areas by 2013.</i>	NECESSARY/ 1, 2, 4, 6	BD, SM, FW, FM, CI	1.1.1, 1.1.2	Landowner contact database was updated by adding contacts in new active focal areas by 2013	NCC
<i>1.3.1 Re-assess status of target viabilities and threat ranks at bioregion scale for next generation NACP by 2017.</i>	NECESSARY/ 1,2,3,4	ALL	ALL	Status of target viabilities and threat ranks at bioregion scale for next generation NACP were re-assessed by 2017.	NCC
<i>1.3.2 Review Bioregion Conservation Strategy annually and report progress internally and externally where appropriate.</i>	NECESSARY/ 1,2,3,4	ALL	ALL	Bioregion Conservation Strategy was reviewed and progress reported on annually internally and externally where appropriate.	NCC
<i>1.3.3 Update land prioritization within the Bioregion to account for new protected areas designated by the province under action 1.1.2 by 2013.</i>	NECESSARY/ 1,3,4	ALL	ALL	Prioritization within the Bioregion was updated by 2013 to account for new protected areas designated by the province under action 1.1.2.	NCC
2. Stewardship – Land/ Water Management					
<i>2.1.1 Prepare Interim Stewardship Statements within one year and Property Management Plans following NCC's approved Stewardship Performance Standards for secured properties.</i>	NECESSARY/ 2, 3, 4, 5, 6	ALL	1.1.1, 1.1.2, 2.1.2, 5.3.1, 6.1.1, 6.1.2	Interim Stewardship Statements (ISS) were completed within one year of closing for all secured properties. Baseline Inventories were completed and Property Management Plans (PMP) developed according to NCC policy and standards.	NCC
<i>2.1.2 Implement critical Property Management Plan actions on NCC lands through 2017.</i>	CRITICAL/2, 3, 4, 5, 6	ALL	1.1.1, 1.1.2, 1.3.1, 2.1.2, 5.3.1, 6.1.1, 6.1.2	Critical Property Management Plan actions were implemented on all NCC-owned properties, both newly acquired and previously owned during 2012 - 2017.	NCC

Conservation Actions	Importance/ Associated Goals ¹	Biodiversity Target(s) ²	Threat(s) ³	Measures of Success (MOS) ⁴ / Notes	Partners Identified
2.1.3 Monitor NCC properties annually for impacts from aquaculture sites and ATV use and respond to any potential threats to biodiversity targets.	NECESSARY/ 2, 3, 4, 5, 6	ALL	2.4.1, 6.1.1, 6.1.2	NCC coastal properties were monitored annually for impacts from nearby aquaculture activities and ATV use and response actions developed as necessary to address problems. ATV use on beaches was reported to the authorities. Public information related to development / expansion of the aquaculture industry in the Bioregion was reviewed at least once every two years to evaluate future threat.	NCC PNB EC
2.1.4.a. Implement Ecoregion 6 conservation targets for 14 old forest communities and 6 old-forest wildlife habitats in the 2012 Crown forest management plan. 2.1.4.b. Maintain watercourse and wetland buffer zones on Crown land. 2.1.4.c. Identify and conserve deer winter habitat on Crown land. 2.1.4.d. Identify and conserve site-specific habitats for species at risk and other species (e.g., heron colonies) on Crown land.	NECESSARY/ 1, 3, 4	BD, SM, FW, FM, CI, GB	1.1.1, 1.1.2, 1.3.1, 2.1.1, 2.1.2, 2.4.1, 3.2.1., 3.3.1, 5.3.1, 6.1.1., 6.1.2.	Successful and full implementation of all habitat conservation measures in Crown forest management plans and operations.	PNB
2.1.5 Consider the integrity of priority habitats in PNB land use decision processes for Crown and private lands and waters.	NECESSARY/ 1, 3, 4	BD, SM, FW, FM, CI, GB	1.1.1, 1.1.2, 1.3.1, 2.1.1, 2.1.2, 2.4.1, 3.2.1., 3.3.1, 5.3.1, 6.1.1., 6.1.2.	Population and habitat monitoring indicates stable or improving conditions.	PNB

Conservation Actions	Importance/ Associated Goals ¹	Biodiversity Target(s) ²	Threat(s) ³	Measures of Success (MOS) ⁴ / Notes	Partners Identified
3. Stewardship - Species Management					
<i>3.1.1 Participate annually in active recovery planning meetings for Species at Risk.</i>	NECESSARY/ 2, 3, 6	BD	1.1.1, 1.1.2, 1.3.1	Attend working group meetings for the Piping Plover recovery team (annually) and support recovery strategy for Piping Plover. If working groups are established for any other nested target species, provide NCC representation to group.	NCC PNB EC
<i>3.1.2 Nature NB's Piping Plover Guardians to monitor Piping Plover nests and nesting beaches annually throughout the breeding season.</i>	CRITICAL/2, 3, 4, 6	BD	1.1.2, 1.3.1, 6.1.1, 6.1.2	All breeding beaches throughout bioregion are checked for Piping Plover early in the breeding season. Beaches where birds are found to be breeding are monitored regularly throughout the breeding season. Annual monitoring will help with meeting targets established by the recovery plan for the eastern melodus subspecies when the plan becomes available. NCC will work towards contributing to meeting those targets.	Nature NB EC
<i>3.1.3 Strengthen partnership with Atlantic Conservation Data Centre (ACCDC) through annual submission of monitoring findings on conservation lands.</i>	BENEFICIAL/ 2, 6	ALL	ALL	Baseline and annual monitoring information of rare species is submitted to ACCDC every year.	NCC EC Nature NB DUC PNB NTNB
<i>3.1.4 Work with Canadian Wildlife Service (CWS) staff to identify appropriate groups / agencies to address necessary recovery actions to protect Species at Risk in the Bioregion (including Maritime Ringlets, Gulf of St Lawrence Aster and listed grassland birds).</i>	NECESSARY /2,3,6	GB, SM, BD	2.1.2	Best management practices are applied in agricultural lands to protect grassland birds as well as monitoring Species at Risk in the Bioregion.	NCC EC NBNT PNB
<i>3.1.5 Bird Studies Canada (BSC) to complete reports on habitat associations and threats to grassland birds by 2013 using data from the recently completed Maritime Breeding Bird Atlas.</i>	Necessary /2,3,4	GB	2.1.2	Reports on habitat associations and threats are completed by BSC by 2013. This information will be used by NCC and others to evaluate threat and appropriate actions for grassland birds in the region.	BSC
4. Communications, Education and Awareness					

Conservation Actions	Importance/ Associated Goals ¹	Biodiversity Target(s) ²	Threat(s) ³	Measures of Success (MOS) ⁴ / Notes	Partners Identified
4.3.1 Host at least one annual community outreach event or Conservation Volunteer event in the Bioregion.	BENEFICIAL/ 2, 5, 6	ALL	ALL	At least one community outreach event or Conservation Volunteer event was held in the Bioregion annually.	NCC
4.3.2 Continue ongoing local community outreach, awareness and education activities related to Piping Plover recovery, implemented through Nature NB.	NECESSARY/ 2, 3, 4, 5, 6	ALL	1.1.1, 1.1.2, 1.3.1, 6.1.1, 6.1.2	Local population in the Acadian Peninsula bioregion is educated on sensitivities of coastal ecosystem habitats. Education programs were implemented for ATV riders about erosion and habitat destruction caused by ATVs, and on conservation and restoration of Marram Grass as a way of enhancing Piping Plover nesting habitat.	Nature NB EC
4.3.3 Support Communications, Education and Awareness initiatives of other conservation groups or agencies between 2012 and 2017.	NECESSARY/ 2, 5, 6	ALL	ALL	NCC met with members of local conservation groups at least once per year to ensure support of partner projects. Initiatives discussed included improvement of target Assessment (e.g. grassland birds) and mitigation of threats (e.g. agricultural best practices).	NCC
4.3.4 Enhance EHJV's profile in the region and public understanding of and support for conservation through a minimum of three targeted media hits covering work in the bioregion between 2012 and 2017.	NECESSARY/ 2, 5, 6	ALL	ALL	The successful protection of acquired lands and other initiatives undertaken by NCC alone or in collaboration with partners was celebrated through a series of communication activities including but not limited to: news releases, press conferences, events, website and newsletter articles. Achieve a minimum of 3 earned media hits per year directly related to work in the bioregion.	NCC
7. Philanthropy, Marketing and Capacity Building					
7.2.1 Attend partnership meetings and any relevant ecotourism development meetings on on-going basis to build & strengthen partnerships.	NECESSARY/ 1, 2, 3, 4, 5, 6	ALL	ALL	Attend partnership meetings and any relevant ecotourism development meetings; input from partners is incorporated for Bioregion plan on yearly updates. Met with local groups, e.g., Tabusintac Watershed Group, the Club de naturalistes de la Péninsule Acadienne, Partenariat pour la gestion intégrée du bassin versant de la baie de Caraquet Inc., etc. where appropriate on local ecotourism initiatives.	NCC

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APPENDIX A: List of Abbreviations

Acronyms	Full reference
ATV	All-terrain-vehicle
ACCDC	Atlantic Conservation Data Centre
BD	Beaches/Dunes
BSC	Bird Studies Canada
CAP	Conservation Action Planning
CI	Coastal Islands
CNPA	Club de naturalistes de la Péninsule acadienne
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
CWS	Canadian Wildlife Service
DUC	Ducks Unlimited Canada
EC	Environment Canada
EHJV	Eastern Habitat Joint Venture
FM	Forest Mosaic
FW	Freshwater Wetland
GB	Grassland Birds
IBA	Important Bird Area
IUCN-CMP	International Union for the Conservation of Nature and Natural Resources – Conservation Measures Partnership
LCI	Landscape Context Index
MBBA	Maritime Breeding Bird Atlas
MOS	Measure of Success
NAAP	Northern Appalachian - Acadian Ecoregional Plan
NABCI	North American Bird Conservation Initiative
NACP	Bioregion Conservation Plan
NAWCA	North American Waterfowl Conservation Act
NB	New Brunswick
NB DNR	New Brunswick Department of Natural Resources
NB EHJV	New Brunswick Eastern Habitat Joint Venture
NWA	National Wildlife Area
Pers. comm.	Personal Communication
Pers. obs.	Personal observation
SAR	Species at Risk
SM	Salt Marsh
USFWS	U.S. Fish and Wildlife Service

APPENDIX B: Glossary of Biodiversity and Conservation Ranks

Committee on the Status of Endangered Wildlife in Canada (COSEWIC): is a national committee of experts that assesses and designates which wild species are in danger of disappearing from Canada. COSEWIC assigns the following status to species:

Extinct (EXT)	A species that no longer exists
Extirpated (EXP)	A species no longer existing in the wild in Canada, but occurring elsewhere in the wild
Endangered (END)	A species facing imminent extirpation or extinction throughout its range
Threatened (THR)	A species likely to become endangered if nothing is done to reverse the factors leading to its extirpation or extinction
Special Concern (SC)	A species of special concern because of characteristics that make it particularly sensitive to human activities or natural events, but does not include an extirpated, endangered or threatened species
Not At Risk (NAR)	A species that has been evaluated and found to be not at risk
Data Deficient (DD)	A species for which there is insufficient information to support a status designation

Species at Risk (SAR): species designated as Endangered, Threatened or Special Concern by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) or listed through federal or provincial endangered species legislation.

Global Rank (G-RANK): the overall status of a species or ecological community is regarded as its "global" status; this range-wide assessment of condition is referred to as its global conservation status rank. Global conservation status assessments are generally carried out by NatureServe scientists with input from relevant natural heritage member programs (e.g., CDCs and NHICs) and experts on particular taxonomic groups, and are based on a combination of quantitative and qualitative information. The factors considered in assessing conservation status include the total number and condition of occurrences; population size; range extent and area of occupancy; short- and long-term trends in these previous factors; scope, severity, and immediacy of threats, number of protected and managed occurrences, intrinsic vulnerability and environmental specificity.

Global Ranks

Rank	Definition
GX	Presumed Extinct (species): Not located despite intensive searches and virtually no likelihood of rediscovery. Eliminated (ecological communities): Eliminated throughout its range, with no restoration potential due to extinction of dominant or characteristic species.
GH	Possibly Extinct (species): Missing; known from only historical occurrences but still some hope of rediscovery. Presumed Eliminated: Historic, ecological communities)-Presumed eliminated throughout its range, with no or virtually no likelihood that it will be rediscovered, but with the potential for restoration, for example, American Chestnut Forest.
G1	Critically Imperilled: At very high risk of extinction due to extreme rarity (often 5 or fewer populations), very steep declines, or other factors.
G2	Imperilled: At high risk of extinction due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors.
G3	Vulnerable: At moderate risk of extinction due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors.
G4	Apparently Secure: Uncommon but not rare; some cause for long-term concern due to declines or other factors.
G5	Secure: Common; widespread and abundant.

Variant Ranks

Rank	Definition
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G#G#	Range Rank —A numeric range rank (e.g., G2G3) is used to indicate the range of uncertainty in the status of a species or community. A G2G3 rank would indicate that there is a roughly equal chance of G2 or G3 and other ranks are much less likely. Ranges cannot skip more than one rank (e.g., GU should be used rather than G1G4).
GU	Unrankable —Currently unrankable due to lack of information or due to substantially conflicting information about status or trends. Whenever possible, the most likely rank is assigned and a question mark qualifier may be added (e.g., G2?) to express minor uncertainty, or a range rank (e.g., G2G3) may be used to delineate the limits (range) of uncertainty.
GNR	Unranked —Global rank not yet assessed.
GNA	Not Applicable —A conservation status rank is not applicable because the species is not a suitable target for conservation activities.

Rank Qualifiers

Rank	Definition
?	Inexact Numeric Rank —Denotes some uncertainty about the numeric rank (e.g. G3? - Believed most likely a G3, but some chance of either G2 or G4).
Q	Questionable taxonomy —Taxonomic distinctiveness of this entity at the current level is questionable; resolution of this uncertainty may result in change from a species to a subspecies or hybrid, or the inclusion of this taxon in another taxon, with the resulting taxon having a lower-priority conservation priority.
C	Captive or Cultivated Only —At present extant only in captivity or cultivation, or as a reintroduced population not yet established.

Sub-national (Provincial) Rank (S-RANK): provincial ranks are used by natural heritage member programs to set conservation priorities for rare species and vegetation communities. These ranks are not legal designations. Provincial ranks are assigned in a manner similar to that described for global ranks, but consider only those factors within the political boundaries of a province. Comparison of global and provincial ranks, gives an indication of the status and rarity of an element in that province in relation to its overall conservation status, therefore providing insight into the urgency of conservation action for it in the province.

Subnational (S) Conservation Status Ranks

Status	Definition
SX	Presumed Extirpated —Species or community is believed to be extirpated from the province. Not located despite intensive searches of historical sites and other appropriate habitat, and virtually no likelihood that it will be rediscovered.
SH	Possibly Extirpated (Historical) —Species or community occurred historically in the province, and there is some possibility that it may be rediscovered. Its presence may not have been verified in the past 20-40 years. A species or community could become SH without such a 20-40 year delay if the only known occurrences in a nation or state/province were destroyed or if it had been extensively and unsuccessfully looked for. The SH rank is reserved for species or communities for which some effort has been made to relocate occurrences, rather than simply using this status for all elements not known from verified extant occurrences.
S1	Critically Imperilled —Critically imperilled in the province because of extreme rarity (often 5 or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the province.
S2	Imperilled —Imperilled in the province because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the nation or state/province.
S3	Vulnerable —Vulnerable in the province due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.
S4	Apparently Secure —Uncommon but not rare; some cause for long-term concern due to declines or other factors.
S5	Secure —Common, widespread, and abundant in the province.
	Unranked —Province conservation status not yet assessed.

SNR	Unrankable —Currently unrankable due to lack of information or due to substantially conflicting information about status or trends.
SU	Not Applicable —A conservation status rank is not applicable because the species is not a suitable target for conservation activities.
SNA	Range Rank —A numeric range rank (e.g., S2S3) is used to indicate any range of uncertainty about the status of the species or community. Ranges cannot skip more than one rank (e.g., SU is used rather than S1S4).
S##	

APPENDIX C: List of Significant Species for the Acadian Peninsula Bioregion

This appendix provides a list of significant species for the Acadian Peninsula including those identified in the NCC / TNC Conservation Blueprint (CB) for the ecoregion. The basis of this list is primarily a subset of the Atlantic Canada Conservation Data Centre (ACCDC) database refined to include only sightings recorded post 1990 and with a Provincial Rank of S1 or S2. Also included are the BCR 14 priority bird species, with additional local fauna and flora identified by the Club de naturalistes de la Péninsule Acadienne. The BCR 14 priority bird species were included due to their importance to partners and related conservation work taking place in the bioregion. While some species are considered rare provincially and therefore receive a S1 or S2 ranking, the same species may not be rare globally and so may receive a G4 or G5 ranking.

Scientific Name	Common Name	COSEWIC Status ¹	Provincial status ²	G Rank ³	S Rank ⁴	Bluepr int Target (Y/N or Primar y/ Secon dary)	Other Status ⁵	Priority Habitat						Notes ⁶ ,
								Beaches/Dunes	Salt Marshes	Freshwater Wetlands	Forest Mosaic	Coastal Islands	Grasslands	
Fungi or Lichens														
None considered														
Non-vascular Plants														
None considered														
Vascular Plants														
Amerorchis rotundifolia	Small Round-leaved Orchid			G5	S2					x	x			
Anemone quinquefolia	Wood Anemone			G5	S4		+				x			Found only in one location of the Acadian Peninsula so considered rare for this area (club de naturaliste de la Péninsule Acadienne (CNPA))
Atriplex franktonii	Frankton's Saltbush			G2G4	S2			x	x					
Botrychium lunaria	Common Moonwort			G5	S1			x				x		Found in Grand Plaine, Miscou; there is a risk that this small colony will be crushed by ATVs (CNPA)

Scientific Name	Common Name	COSEWIC Status ¹	Provincial status ²	G Rank ³	S Rank ⁴	Blueprint Target (Y/N or Primary/Secondary)	Other Status ⁵	Priority Habitat						Notes ⁶
								Beaches/Dunes	Salt Marshes	Freshwater Wetlands	Forest Mosaic	Coastal Islands	Grasslands	
<i>Blysmus rufus</i>	Red Bulrush			G5	S2				x					
<i>Callitriche hermaphroditica</i>	Northern Water-starwort			G5	S2				x		x			Occurs primarily in the upper tidal zone of rivers where water is almost fully fresh (ACCDC)
<i>Calypso bulbosa</i> var. <i>americana</i>	Fairy Slipper			G5T5?	S2					x	x			CNPA;
<i>Carex albicans</i> var. <i>emmonsii</i>	White-tinged Sedge			G5T5	S2			x			x	x		
<i>Carex glareosa</i> var. <i>amphigena</i>	Gravel Sedge			G4G5T3T5	S1				x					
<i>Carex rariflora</i>	Loose-flowered Alpine Sedge			G5	S1					x				
<i>Carex salina</i>	Saltmarsh Sedge			G5	S2				x					
<i>Catabrosa aquatica</i> var. <i>laurentiana</i>	Brook Grass			G5TN R	S1				x	x				(Water Whorl Grass) Occurs on the upper borders of salt marshes (ACCDC)
<i>Chenopodium rubrum</i>	Coast-blite Goosefoot			G5	S2			x	x					(Red Pigweed)
<i>Cuscuta cephalanthi</i>	Button-bush Dodder			G5	S1?				x					
<i>Cyperus bipartitus</i>	Shining Flatsedge			G5	S1				x	x				Occurs in freshwater tidal areas (ACCDC)
<i>Draba incana</i>	Hoary Whitlow-grass			G5	S1			x				x		(Twisted Whitlow-grass)
<i>Eriophorum gracile</i>	Slender Cotton-grass			G5	S1					x				
<i>Goodyera oblongifolia</i>	Giant Rattlesnake-plantain			G5?	S2					x	x			(Menzies' Rattlesnake-plantain)
<i>Juncus vaseyi</i>	Vasey's Rush			G5?	S2			x		x		x		

Scientific Name	Common Name	COSEWIC Status ¹	Provincial status ²	G Rank ³	S Rank ⁴	Blueprint Target (Y/N or Primary/Secondary)	Other Status ⁵	Priority Habitat						Notes ⁶
								Beaches/Dunes	Salt Marshes	Freshwater Wetlands	Forest Mosaic	Coastal Islands	Grasslands	
<i>Lechea maritima</i> var. <i>subcylindrica</i>	Beach Pinweed	special concern		G5T1	S2			x				x		
<i>Listera australis</i>	Southern Twayblade		endangered	G5	S2		+			x	x			Local naturalists think this species may be present in this bioregion due to suitable habitat (L. Richardson pers. comm.). Forest mosaic could justifiably be added since the species is often found in treed wetlands (ACCDC)
<i>Puccinellia laurentiana</i>	Tracadigash Mountain Alkali Grass			G3?Q	S2			x	x			x		(Nootka Alkali Grass)
<i>Puccinellia phryganodes</i>	Creeping Alkali Grass			G5	S2			x	x			x		
<i>Sagina nodosa</i>	Knotted Pearlwort			G5	S2			x	x					
<i>Sagittaria calycina</i> var. <i>spongiosa</i>	Spongy Arrowhead			G5T4	S2				x	x				(Long-lobed Arrowhead) freshwater tidal species (ACCDC)
<i>Salix candida</i>	Hoary Willow			G5	S2					x				(Sage Willow)
<i>Sanguisorba canadensis</i>	Canada Burnet			G5	S2					x				
<i>Stellaria longipes</i>	Long-stalked Stitchwort			G5	S1			x				x		(Long-stalked Starwort)
<i>Symphyotrichum laurentianum</i>	St Lawrence Aster	threatened	threatened	G2	S1			x	x					
<i>Symphyotrichum subulatum</i> var. 2	Bathurst Aster	special concern	special concern	G5T1	S2				x					Known from only approx. 9 sites in NB, by Bathurst NB (NatureServe); freshwater tidal species (ACCDC) Brackish water tidal species known from 10 sites in NB, scattered in upper estuaries from the Bay of Bathurst to the

Scientific Name	Common Name	COSEWIC Status ¹	Provincial status ²	G Rank ³	S Rank ⁴	Blueprint Target (Y/N or Primary/Secondary)	Other Status ⁵	Priority Habitat						Notes ⁶
								Beaches/Dunes	Salt Marshes	Freshwater Wetlands	Forest Mosaic	Coastal Islands	Grasslands	
														Richibucto River system (ACCDC).
<i>Vaccinium boreale</i>	Northern Blueberry			G4	S1					x		x		
<i>Vaccinium uliginosum</i>	Alpine Bilberry			G5	S1							x		
<i>Zizania aquatica</i> var. <i>brevis</i>	Eastern Wild Rice			G5T3	S1				x	x				(Indian Wild Rice) freshwater tidal species (ACCDC)
Invertebrates														
<i>Boloria eunomia</i>	Bog Fritillary			G5	S1S2					x				
<i>Callophrys henrici</i>	Henry's Elfin			G5	S2					x	x			
<i>Coenagrion interrogatum</i>	Subarctic Bluet			G5	S2					x				
<i>Coenonympha nipsisquit</i>	Maritime Ringlet	endangered	endangered	G1	S1	Y			x					CB target
<i>Leucorrhinia patricia</i>	Canada Whiteface			G4	S1					x				
<i>Strymon melinus</i>	Gray Hairstreak			G5	S2						x			
Fish														
<i>Morone saxatilis</i>	Striped Bass	threatened		G5	S2						x			
Reptiles														
<i>Glyptemys insculpta</i>	Wood Turtle	threatened		G3	S3		+		x		x		x	this species is occurring under "grassland birds" to account for the fact that it uses

Scientific Name	Common Name	COSEWIC Status ¹	Provincial status ²	G Rank ³	S Rank ⁴	Blueprint Target (Y/N or Primary/Secondary)	Other Status ⁵	Priority Habitat						Notes ⁶
								Beaches/Dunes	Salt Marshes	Freshwater Wetlands	Forest Mosaic	Coastal Islands	Grasslands	
														similar habitat;
Amphibians														
none														
Birds														
<i>Accipiter gentilis</i>	Northern Goshawk			G5	S4B		^				x			
<i>Actitis macularius</i>	Spotted Sandpiper			G5	S5B,S5M		^	x	x	x		x		
<i>Aegolius funereus</i>	Boreal Owl			G5	S1S2B					x	x			
<i>Aix sponsa</i>	Wood Duck			G5	S4B		^			x	x			
<i>Ammodramus nelsoni</i>	Nelson's Sparrow			G5	S3B		^		x			x	x	
<i>Anas crecca</i>	Green-winged Teal			G5	S5B		^		x	x	x		x	Can nest on forest ponds (ACDC)
<i>Anas clypeata</i>	Northern Shoveler			G5	S2B					x				
<i>Anas platyrhynchos</i>	Mallard			G5	S5B,S4N		^			x			x	
<i>Anas rubripes</i>	American Black Duck			G5	S5B,S4N		^	x	x	x	x	x	x	
<i>Anas strepera</i>	Gadwall			G5	S2B				x	x				
<i>Ardea herodias</i>	Great Blue heron			G5	S4B		+		x		x	x		bioregion supports important nesting colonies of this species
<i>Asio flammeus</i>	Short-eared Owl	special concern		G5	S3B		^ +	x	x	x		x	x	
<i>Aythya collaris</i>	Ring-necked Duck			G5	S5B		^			x	x			Slight positive associations with mature cedar (at 200m) and overmature poplar stands

Scientific Name	Common Name	COSEWIC Status ¹	Provincial status ²	G Rank ³	S Rank ⁴	Blueprint Target (Y/N or Primary/Secondary)	Other Status ⁵	Priority Habitat						Notes ⁶
								Beaches/Dunes	Salt Marshes	Freshwater Wetlands	Forest Mosaic	Coastal Islands	Grasslands	
														(BSC); this species is a ground nester in wetlands (ACDC)
<i>Aythya marila</i>	Greater Scaup			G5	S1B,S2N					x				CNPA
<i>Bartramia longicauda</i>	Upland Sandpiper			G5	S1B	Y							x	Historical records; CB target
<i>Bonasa umbellus</i>	Ruffed Grouse			G5	S5		^				x			
<i>Botaurus lentiginosus</i>	American Bittern			G4	S4B		^			x				
<i>Branta bernicla</i>	Brant			G5	S2S3M, S2S3N				x					Found throughout the coastal habitats of the Acadian Peninsula (CNPA)
<i>Branta canadensis</i>	Canada Goose			G5	S4B,S4M		^		x	x		x	x	
<i>Bucephala clangula</i>	Common Goldeneye			G5	S4B,S5M,S4N		^			x	x			No habitat association data available (BSC)
<i>Bucephala islandica</i> pop.1	Barrow's Goldeneye – Eastern Population	special concern		G5T3	SNR		^					x		No habitat association data available (BSC). Wintering bird typically observed near ice free mussel beds.
<i>Buteo lineatus</i>	Red-shouldered Hawk			G5	S2B						x			Barely present as a nesting species in this region (ACDC)
<i>Butorides virescens</i>	Green Heron			G5	S1S2B					x				Barely present as a nesting species in this region (ACDC)
<i>Calidris alba</i>	Sanderling			G5	S4M,S1N			x	x			x		CNPA
<i>Calidris canutus</i>	Red Knot	endangered		G4	S3M			x				x		
<i>Caprimulgus vociferus</i>	Whip-Poor-Will	threatened		G5	S2B		^				x			Open, patchy or regenerating forest (MBBA)

Scientific Name	Common Name	COSEWIC Status ¹	Provincial status ²	G Rank ³	S Rank ⁴	Blueprint Target (Y/N or Primary/Secondary)	Other Status ⁵	Priority Habitat						Notes ⁶
								Beaches/Dunes	Salt Marshes	Freshwater Wetlands	Forest Mosaic	Coastal Islands	Grasslands	
<i>Carpodacus purpureus</i>	Purple Finch			G5	S4B		^				x			
<i>Catharus fuscescens</i>	Veery			G5	S4S5B		^			x	x		x	
<i>Catoptrophorus semipalmatus</i>	Willet			G5	S2S3B			x	x			x		CNPA
<i>Megaeryle alcyon</i>	Belted Kingfisher			G5	S5B		^		x				x	(<i>Ceryle alcyon</i>)
<i>Charadrius melodus</i>	Piping Plover	endangered	endangered	G3TNR	S2B	Y	^ +	x	x			x		CB target
<i>Charadrius vociferus</i>	Killdeer			G5	S4B		^		x	x		x	x	
<i>Chaetura pelagica</i>	Chimney swift	threatened		G5	S2S3B		^				x		x	Roosting site in the chimney of the church of Paquetville (CNPA)
<i>Chordeiles minor</i>	Common Nighthawk	threatened		G5	S4B		^	x		x	x		x	
<i>Chroicocephalus ridibundus</i>	Black-headed Gull			G5	S2M,S1N			x				x		(<i>Larus ridibundus</i>); of minor concern – relatively small numbers only and region likely of limited importance to the species in North America (ACCDC)
<i>Coccothraustes vespertinus</i>	Evening Grosbeak			G5	S5		^				x			Habitat analysis not available (BSC)
<i>Coccyzus erythrophthalmus</i>	Black-billed Cuckoo			G5	S4B		^				x			Habitat association analysis not available for NB (BSC)
<i>Contopus cooperi</i>	Olive-sided Flycatcher	threatened		G4	S5B		^			x	x			
<i>Contopus virens</i>	Eastern Wood-Pewee			G5	S5B		^			x	x			
<i>Dendroica caerulescens</i>	Black-Throated Blue Warbler			G5	S5B		^				x			

Scientific Name	Common Name	COSEWIC Status ¹	Provincial status ²	G Rank ³	S Rank ⁴	Blueprint Target (Y/N or Primary/Secondary)	Other Status ⁵	Priority Habitat						Notes ⁶
								Beaches/Dunes	Salt Marshes	Freshwater Wetlands	Forest Mosaic	Coastal Islands	Grasslands	
<i>Dendroica castanea</i>	Bay-breasted Warbler			G5	S5B		^				x			
<i>Dendroica fusca</i>	Blackburnian Warbler			G5	S5B		^				x			
<i>Dendroica tigrina</i>	Cape May Warbler			G5	S5B		^				x			
<i>Dendroica magnolia</i>	Magnolia Warbler			G5	S5B		^			x	x			
<i>Dendroica virens</i>	Black-throated Green Warbler			G5	S5B		^				x			
<i>Dolichonyx oryzivorus</i>	Bobolink	threatened		G5	S3S4B		^						x	
<i>Empidonax traillii</i>	Willow Flycatcher			G5	S1S2B					x	x			
<i>Eremophila alpestris</i>	Horned Lark			G5	S2B								x	
<i>Euphagus carolinus</i>	Rusty Blackbird	special concern		G4	S3B		^			x	x			
<i>Falco rusticolus</i>	Gyr Falcon			G5	S1N			x	x			x	x	Of minor concern – very small numbers present irregularly as non-breeders (ACDC)
<i>Gallinago delicata</i>	Wilson's Snipe			G5	S5B, S5M		^			x			x	
<i>Gavia immer</i>	Common Loon			G5	S4B, S5M, S4N		^			x				No habitat association data available
<i>Haliaeetus leucocephalus</i>	Bald Eagle		endangered	G5	S3B		^			x	x		x	Positive association with mature red/white spruce, poplar and overmature tolerant hardwood; also detected near cultivated grasslands and coastal habitats (large open areas at a landscape level)
<i>Hirundo rustica</i>	Barn Swallow	threatened		G5	S3B								x	

Scientific Name	Common Name	COSEWIC Status ¹	Provincial status ²	G Rank ³	S Rank ⁴	Blueprint Target (Y/N or Primary/Secondary)	Other Status ⁵	Priority Habitat						Notes ⁶
								Beaches/Dunes	Salt Marshes	Freshwater Wetlands	Forest Mosaic	Coastal Islands	Grasslands	
<i>Histrionicus histrionicus</i> pop. 1	Harlequin Duck Eastern Population	special concern		G4T4	S1B, S1N		^ +			x	x			
<i>Hylocichla mustelina</i>	Wood Thrush			G5	S1S2B						x			Thought to now be essentially absent from the area as a nesting species (ACCDC)
<i>Nycticorax nycticorax</i>	Black-crowned Night-Heron			G5	S2B		+		x	x	x	x		CNPA; bioregion has important colony nesting sites;
<i>Oxyura jamaicensis</i>	Ruddy Duck			G5	S1B, S4N					x				
<i>Pheucticus ludovicianus</i>	Rose-breasted Grosbeak			G5	S5B		^			x	x			
<i>Picoides arcticus</i>	Black-backed Woodpecker			G5	S4		^			x	x			
<i>Pinicola enucleator</i>	Pine Grosbeak			G5	S3					x	x			
<i>Podilymbus podiceps</i>	Pied-billed Grebe			G5	S4B		^		x	x				Slight association with red/white spruce saplings, mature maple and overmature hardwoods at 200m; somewhat associated with cultivate grasslands at the landscape level; These associations are not very relevant for this species, which requires open marshy wetlands (ACCDC)
<i>Poecile hudsonicus</i>	Boreal Chickadee			G5	S5		^			x	x			
<i>Poocetes gramineus</i>	Vesper Sparrow			G5	S2B								x	
<i>Porzana carolina</i>	Sora			G5	S4B		^		x	x				
<i>Rallus limicola</i>	Virginia Rail			G5	S3B		^ +			x				
<i>Riparia riparia</i>	Bank Swallow			G5	S3B		^	x		x			x	

Scientific Name	Common Name	COSEWIC Status ¹	Provincial status ²	G Rank ³	S Rank ⁴	Blueprint Target (Y/N or Primary/Secondary)	Other Status ⁵	Priority Habitat						Notes ⁶
								Beaches/Dunes	Salt Marshes	Freshwater Wetlands	Forest Mosaic	Coastal Islands	Grasslands	
<i>Rissa tridactyla</i>	Black-legged Kittiwake			G5	S1B, S4N		+					x		Only one nesting site on cliff near Pokeshaw (CNPA).
<i>Scolopax minor</i>	American Woodcock			G5	S5B, S5M		^			x	x			
<i>Setophaga ruticilla</i>	American Redstart			G5	S5B		^			x	x			
<i>Sphyrapicus varius</i>	Yellow-bellied Sapsucker			G5	S5B		^			x	x			
<i>Sterna hirundo</i>	Common Tern			G5	S3B		^ +	x	x			x		bioregion supports nesting colonies
<i>Sterna paradisaea</i>	Arctic Tern			G5	S2B		+	x				x		CNPA
<i>Sturnella magna</i>	Eastern Meadowlark	threatened		G5	S2B								x	
<i>Tachycineta bicolor</i>	Tree Swallow			G5	S5B		^			x			x	
<i>Toxostoma rufum</i>	Brown Thrasher			G5	S2B						x		x	Frequents shrubby thickets and wood edges (MBBA). It is thought that this species is just a transient breeder in the northeastern section of the province (ACDC)
<i>Tringa solitaria</i>	Solitary Sandpiper			G5	S2B, S5M					x	x			
<i>Tyrannus tyrannus</i>	Eastern Kingbird			G5	S4B		^			x			x	
<i>Vireo solitarius</i>	Blue-headed Vireo			G5	S5B		^			x	x			
<i>Wilsonia canadensis</i>	Canada Warbler	threatened		G5	S4B		^			x	x			
<i>Zonotrichia albicollis</i>	White-throated Sparrow			G5	S5B		^			x	x			

¹ Committee on the Status of endangered Wildlife in Canada (COSEWIC)

² NB Endangered Species Act

Scientific Name	Common Name	COSEWIC Status ¹	Provincial status ²	G Rank ³	S Rank ⁴	Blueprint Target (Y/N or Primary/Secondary)	Other Status ⁵	Priority Habitat					Notes ⁶
								Beaches/Dunes	Salt Marshes	Freshwater Wetlands	Forest Mosaic	Coastal Islands	Grasslands

³ Global Rank

⁴ Sub-national Rank (NB)

⁵ Other Status: ^ Draft BCR 14 high priority birds (preliminary list obtained from Canadian Wildlife Service (Paul Chamberland, pers comm. 2012)); + Species of local conservation concern (local knowledge obtained from club de naturalistes de la Péninsule acadienne)

APPENDIX D: Methodology: Conservation Actions Prioritization

1. Purpose of Analysis

The prioritization methodology used in this report identified areas within the Acadian Peninsula Bioregion where conservation efforts should be concentrated. The goal is to achieve the best possible impact in the areas that are the most critical for the defined biodiversity targets while minimizing threats to those targets.

2. Focal Area Selection

In addition to prioritizing the properties within the entire area of the Acadian Peninsula Bioregion, a small number of Focal Areas (FAs) were identified as well. The main goal of identifying Focal Areas is to concentrate efforts in a few locations to increase the effectiveness of conservation activities such as landowner contact and to promote the creation of large land assemblies. This includes building on existing protected areas secured by partners (e.g. DNR Protected Natural Areas). Properties outside of Focal Areas may be considered as opportunities arise.

Focal Areas were selected based on output from the prioritization analysis (described further below and outlined in Table 1). The FA boundaries were determined by encompassing the greatest concentrations of Priority 1 and 2 properties. Major fragmentation features were also considered and avoided if possible with the boundary delineation (e.g. major highway, harvested bog, major river, etc.). All areas with high densities of Priority 1 and Priority 2 were examined and a small subset of these was identified for conservation action in the NACP. The details surrounding the Focal Area re-prioritization are described below and outlined in Table 2.

3. Conservation Prioritization

The process for assigning priority ranks within the Acadian Peninsula Bioregion used weighting (scoring) certain characteristics of the habitat types higher than others. Wherever possible, weighting criteria included size (e.g. minimum patch size), landscape context (e.g. local connectedness to surrounding landscapes), and condition of the habitat (e.g. age of forest stands). The methodology was deliberately designed to promote parcels of land that contained larger patches of vegetation communities, highly connected landscapes and areas with rare/priority species occurrences. The more high quality biodiversity targets a parcel contained, the higher the priority rank it received. Promoting small extents of multiple biodiversity targets was avoided by selecting a minimum size criteria to habitat-based biodiversity targets. Higher scores were given to properties with larger areas of habitat. Existing protected areas, NCC land and other conservation lands were included in the analysis. All parcels of land that were 1 ha or smaller were removed from the prioritization analysis in order to avoid prioritizing developed areas.

Data Pre-Processing

Forest Resource Inventory

- **Forest Mosaic** - The data used for this target was derived from the Forest Resource Inventory (FRI), which was updated April 29, 2009. The FRI dataset was run through a program developed by the Fish and Wildlife Branch of the Department of Natural Resources which identified 17 unique forest communities (NBDNR 2011). These forest communities represent the full range of naturally occurring old-forest conditions. Communities are defined by overstory composition and stand structure, as described by basal area and density of various diameter classes of live and dead stems (NBDNR 2011). All mature and overmature development stages (L1DS = M and O) were selected for old forest patches.

Table D1. Old Forest Community and Old-Forest Wildlife Habitat Definitions (NBDNR 2011).

Old Forest Type	Forest Communities	Minimum Patch Size	Keystone Species	Total Area of Forest Community in bioregion ha	Total Area of Forest Community that meets minimum patch size ha
Spruce – Fir	Hemlock Cedar Red Spruce Black Spruce Moderate White Spruce Balsam Fir Softwood-Tolerant Hardwood Tolerant Softwood Mix Softwood Mix	>= 50 ha (should be (375ha for Black-backed Woodpecker but only 2 patches available in bioregion)	Boreal Chickadee Olive-sided Flycatcher Red-breasted Nuthatch Cape May Warbler Red Crossbill Pine Siskin Golden-crowned Kinglet Evening Grosbeak Winter Wren White-winged Crossbill	62,878	22,909
Hardwood*	Tolerant Hardwood Pure Tolerant Hardwood- Softwood Tolerant - Intolerant Hardwood Intolerant Hardwood- Mixewood	>= 20 ha	Northern Goshawk Pileated Woodpecker Broad-winged Hawk Yellow-bellied Sapsucker Downy Woodpecker Hairy Woodpecker Northern Flicker Least Flycatcher Blue Jay Black-capped Chickadee Red-eyed Vireo Ovenbird	19,164	6,053
Tolerant Hardwood *	Tolerant Hardwood Pure Tolerant Hardwood- Softwood Tolerant - Intolerant Hardwood	>= 40 ha	White-breasted Nuthatch Barred Owl Black-throated Blue Warbler Eastern Wood-pewee Scarlet Tanager	2,942	87
Pine	Red Pine and White Pine	>= 10 ha	Pine Warbler	561	256
Other	Jack Pine, Poor site Spruce, Tamarack	no minim patch size specified	No nested species specified	4392	N/A

*Habitat types are not mutually exclusive (Tolerant hardwood stands can also meet Old Hardwood definitions)

- Freshwater Wetlands – all bogs (BO), fens (FE), freshwater marshes (FM), forested wetlands (FW), and shrub wetlands (SB) were selected from the FRI database. Only bogs and fens were used in the prioritization analysis as they are the dominant wetland type in the Acadian Peninsula (75% of area of freshwater wetlands) and under the greatest threat from the peat harvesting industry. The second dominant type is shrub wetland (24% of wetland area) which is not threatened, and therefore was not prioritized in this bioregion. The Peatlands database was also used to distinguish between bog/fen complexes that had already been harvested or been used for cranberry harvesting versus bogs/fens that are intact. Any overlap between the peatland polygons and FRI wetlands was eliminated before the weights were assigned. A 275 metre buffer was also added to the bog/fen polygons after weights were assigned based on the area of the wetland. Studies have shown that narrow buffers of 30 metres (or less) do provide some benefit to larger wetlands but wider buffers are needed to protect their ecological integrity and to provide benefit to wildlife that use the wetlands and surrounding area (Environment Canada, Canadian Wildlife Service, and Ontario Ministry of Natural Resources and Ontario Ministry of Environment 1998). Most waterfowl nest within 240 metres and most turtles nest and hibernate within 275 m of a marsh. Other species such as Northern Harrier and Short-eared Owl also use buffers for hunting and nesting grounds (Environment Canada et al. 2012).
- Salt Marshes – all salt marshes (CM) were selected from the FRI database. They were then dissolved in ArcGIS to eliminate any artificial barriers (e.g. small roads, different vegetation) between contiguous patches. Each polygon was buffered 20m (40m between polygons) and then dissolved. Area was recalculated and weights were then assigned based on the new area of the dissolved polygons. Beaches and dunes were also intersected with NAAP critical coastal complexes. A 275 metre buffer was added for the same rationale as above for freshwater wetlands. Dominique Berube, a coastal erosion specialist, recommends a buffer greater than 200 m in order to account for potential future migration inland with the increase of sea-level (Dominique Berube, pers. Comm. 2012). He does caution against using the same buffer for all areas within the Bioregion. Larger buffers may be necessary once a site visit has been conducted in particular area in order to allow inland migration of the salt marsh.
- Beaches/Dunes – selected all beaches and dunes from the FRI dataset (WC = BE and DU). All beaches and dunes were dissolved in ArcGIS to eliminate any insignificant boundaries (e.g. small roads, different vegetation) between contiguous patches. Beaches and dunes were also intersected with NAAP critical coastal complexes. Although beaches and dunes require inland buffer to allow inland migration (Dominique Berube pers. Comm. 2012), most of the beaches in this bioregion are surrounded by salt marsh; therefore securing buffer to salt marshes will also allow beaches to migrate inland as well.
- Grasslands - The habitat (Code = CL and FP) was incorporated in the prioritization analysis as a proxy for locations of grasslands. Agriculture lands with grains or row crops as well as fallow pasture land were selected from the FRI database as advised. All grasslands were dissolved in ArcGIS to eliminate any insignificant barriers (e.g. small roads, different vegetation) between contiguous patches. Area was recalculated and weights were then assigned based on the new area of the dissolved polygons.

- Smaller coastal islands, which were not connected to the mainland by roads or bridges, were selected from property boundaries in the 2011 Service New Brunswick property layer. The FRI database was not reliable to select small coastal islands as some of the smaller coastal islands are not photo interpreted. The Atlantic Canada Conservation Data Centre (ACCDC 2012) species database and expert opinion was used to identify islands that are currently being used by migratory species and colonial nesters (e.g. Great Blue Heron).

3.1.1.1. Nested Targets

- Rare Species (S1-S3), BCR 14 Priority Species, Colonial/Migratory Species - The most recent Atlantic Canada Conservation Data Centre (ACCDC 2012) element occurrence dataset was used to query out all species records that were taken from 1990-present and that were S1-S3, Species at Risk. Colonial data, including surveys of species including Great Blue Heron, Black-crowned Night Heron, and Red Knot were included in the analysis as well.

Table D2. Precision of Element Occurrence records from the Atlantic Canada Conservation Data Centre (2012).

Precision Value	Average Precision Radius	Range of Precision Radius	Buffer Radius
3.7-4.0	Breeding Bird Atlas grid (10km ²)	2.8-17.8 km	BBA grid (10km ²)
2.7-3.0	500m/1.0km	281m-1.8km	1800m
1.7-2.0	50-100m	28.1m-177.8m	178m
0.0-1.0	1m-10m	0.6-17.8m	17.8m

Focal Area Analysis

3.1.1.2. Pseudo Targets

- Existing Protected Areas and NCC lands - In order to promote lands adjacent to existing protected areas for conservation action, a compiled dataset of all conservation lands was used to conduct a secondary analysis at the focal area level.
The following conservation lands were included in this dataset
Provincial Parks
National Parks
Provincial Protected Natural Areas
NCC owned/easement lands
National Wildlife Areas
Ducks Unlimited Canada lands
Eastern Habitat Joint Venture lands
- Local Connectedness (Anderson and Clark 2012) – The local connectedness dataset measures how impaired the structural connections are between natural ecosystems within a local landscape. Roads, development, noise, exposed areas, dams, and other structures all directly alter processes and create resistance to species movement by increasing the risk (or perceived risk) of harm.

The method used to map local connectedness for the region was resistant kernel analysis, using software developed by the UMASS CAPS program (<http://www.umasscaps.org>). Connectedness refers to the connectivity of a focal cell to its ecological neighborhood when it is viewed as a source. Specifically, each cell is coded with a resistance value based on land cover and roads, which are in turn assigned resistance weights by the user.

3.1.2 Cleaning the Data

The first step prior to the prioritization analysis was to clean the GIS data before assignment of weights on the targets was calculated. In order to avoid weighting polygons based on topographic errors, all polygons of the same habitat type were dissolved in ArcGIS to eliminate any insignificant boundaries (e.g. small roads, different vegetation) between contiguous patches. Each polygon was buffered 20m (40m between polygons) to capture the majority of the patches that were close to each other. The selected patches were then dissolved to form new contiguous polygons. Area of each patch was recalculated using XTools Pro and weights were then assigned based on the new area of the dissolved polygons.

3.1.3 Weighting the Data

All targets received a weight based on ecological characteristics such as size, condition or landscape context. All scores were between 0 and 1, the latter representing completely suitable habitat for nested species. For example, if the biodiversity targets met the minimum size criteria based on expert opinion or the literature, it would receive a score or weight of “1”. If it was below the minimum size threshold, then it receives a score from 0 to 0.99 depending on the size of the patch. The sliding scale was calculated by dividing the actual patch size by the minimum patch size. Patches of habitat that are close to the minimum patch size will receive a higher score than those which are smaller. Smaller patches are still used by many species and may offer other benefits other than nesting or breeding grounds; however the larger patches offer the greatest benefit to all species.

Rare/priority species occurrences were weighted based on their level of precision. If the habitat patch has an occurrence record of one of these species, it received an additional weight to add to the overall score. Element occurrences were buffered based on their level of precision. The greatest distance from the range of precision values was used as the buffer radius. Higher precision values received higher weight values as the certainty of the location of the species is higher as well. A full list of significant species is found in Appendix B. Species used in this prioritization are included in the table.

The weighting scheme for the Local Connectedness layer was intentionally more generalized, such that any natural cover adjacent to other natural cover was scored as highly connected. There was no differentiation between forest types, and only slightly between open wetland and upland habitats (Anderson and Clark 2012). The final result was a grid of 90-meter cells for the entire region where each cell was scored with a local connectivity value from 0 (least connected) to 100 (most connected).

Table D3. Ecological values in the bioregion and corresponding score based on certain ecological characteristics (e.g. minimum size, landscape context and condition).

Ecological Value	Layers	Details	Score
Forest Mosaic	Old Forest Communities (DNR definitions)	Below minimum threshold	Sliding scale up to 0.99
		Meets minimum size for Habitat definitions	1
		Old Forest Communities that do not fall into a Old Habitat category (NB DNR 2011)	Sliding scale up to 0.5
	Cedar forest community (not overmature ; L1DS does not = O or M; Mature and Overmature is included in old forest communities layer)	Below minimum threshold	Sliding scale up to 0.99
		Meets minimum size for Habitat definitions	1
Beach/Dune	Wetland inventory/NAAP critical occurrences	Below critical size	Sliding scale up to 0.99
		Above critical size (>20 acres; 8 ha)	1
Salt Marsh	Wetland inventory/NAAP critical occurrences with 275m buffer	Below critical size	Sliding scale up to 0.99
		Above critical size (>50 acres; 20 ha)	1
Coastal Island	Property layer/ migratory species layer (2008)	Identified for migratory/colonial species	1
		Potential migratory/ colony location	0.8
Grassland birds ¹	Agriculture lands and Fallow pasture land (codes = CL, FP in forest inventory)	Below critical size	Sliding scale up to 0.99
		Above minimum patch size (>= 25 acres; 10 ha) U.S. Department of Agriculture, Natural Resources Conservation Service. 2010.	1
Freshwater Wetlands	Bogs/ Fens with 275m buffer *harvested bogs were eliminated from analysis	Below critical size	Sliding scale up to 0.99
		Above critical size (>75 acres; 30 ha)	1

¹ Grasslands are not targeted for securement action.

Priority species	Precision levels - buffered based on precision values (S1-S3)	Precision Value/ (radius buffer m) 0.7 – 1.0 (18m) 1.7 – 2.0 (178m) 2.7- 3.0 (1800m) 3.7 – 4.0 (100km ²) ¹	1 0.8 0.3 0.2
Species at Risk	Species at Risk (COSEWIC and Provincially listed at Risk)	Only precision values between 0- 2.0 were used	1
Local connectedness	Resistance Kernel analysis for the Northern Appalachian-Acadian Ecoregion (values 0-100; higher value, more connected (intact) landscape	Intact scores of 100 Below 100	1 Sliding scale up to 0.99

A secondary analysis at the focal area level was conducted to promote lands adjacent to existing protected areas. If a priority 2 or 3 ranked property was adjacent or within 500m to an existing private or public protected area, it would get upgraded one priority status level (i.e. a priority 2 would be raised to a priority 1). Each time new lands are secured, the properties adjacent to them, should be revaluated. Once the new Protected Natural Areas on Crown land in New Brunswick have been approved, this analysis will be recalculated to take those new conservation lands into consideration.

3.2 CONSERVATION ANALYSIS

The entire prioritization analysis was performed in ArcGIS 9.3 using various tools found in ArcTools and ArcMap.

Step 1 – Preparing the data. For each biodiversity target, all insignificant boundaries were removed by dissolving like polygons together if they were within 40m of each other (e.g. removed boundaries created by roads, different vegetation type etc.). This allowed each target to reflect a more accurate patch size. Areas were recalculated using XTools Pro extension in ArcGIS. Element occurrence records were buffered in ArcGIS (buffer tool) based on the widest value of its precision. For example, if it could be up to 178m away from the point, then all EO records with a precision value of 1.7-2.0 were buffered 178m (see above table).

Step 2 – Identifying critical patches. Patches of habitat that met the minimum size criteria outlined in the table above were added to the attribute table in a separate field.

Step 3 – Assign weights. Weights were added to each patch based on the criteria outlined in the table above. If the patch met the minimum size criteria, it was awarded a weight of “1”. If it was below the size criteria, weights were added based on a sliding scale up to a value of “0.99”. Element occurrence records were weighted based on their precision. All Species at Risk and endemic species occurrences were weighted a score of 1.

¹ buffer area is based on the Breeding Bird Atlas grid (10*10km square or 100km²)

Step 4 – Convert all vector layers into rasters. Once all vector layers (shapefiles) were prepared, they were all converted into a raster using a cell size of 10m. A small cell size was based on the error of the data layers and was used in order to ensure the resolution of the data would not be generalized.

Step 5 – Reclassify all “nodata” to zeros. After conversion to rasters, all “no data” fields needed to be reclassified to zeros. The reclass tool in ArcTool Box was used to reclassify the fields as well as clip all the rasters to the Acadian Peninsula bioregion boundary.

Step 6 – Combine weighted values to calculate overall score. The map algebra tool in ArcTool Box was to combine all raster layers and their weighted values to calculate a final score. Each biodiversity target was weighted the same when each was combined using the map algebra tool.

Step 7 – Reassignment of habitat prioritization to parcel level – In order to convert the habitat prioritization to the parcel level, the mean score from the habitat-based analysis was used to give a parcel an overall score. If 30% or greater of the parcel’s area was P1 habitat (or species), then it automatically received a P1 status. If it did not, the mean score was used to assign an overall score. All parcels 2 acres or smaller, were scored “no priority”. Once final scores were calculated, the natural breaks function was used to display the data in four categories : P1, P2, P3 and “No Priority”.

Step 7 – Focal Area Re-Prioritization. In order to promote the conservation value of properties adjacent to existing protected areas, properties that were within 500m of an existing protected area were selected and all area within that parcel was upgraded one priority stats for P2 and P3 ranks only. Areas with no priority were not upgraded in this analysis.

3.3 RESULTS

The results of the final prioritization seem to be consistent with expert knowledge of conditions across the Acadian Peninsula bioregion, although when the original prioritization (based on habitat polygons) was transferred to the property layer, some larger parcels seem to be downgraded if only a small amount of area was ranked P1. This was due to mean score of all the grids squares of the habitat being used for the overall score of the parcel. In addition, the results of this analysis should be used in combination with field visits and local knowledge. A P3 rank does not indicate that an area is of little conservation value rather it is of lesser conservation value than P1 or P2 areas.

Table D4. Summary results of the property prioritization in the Acadian Peninsula bioregion

Priority Ranking	Break Values/Scores	# of Properties	Acres	Hectares	% of bioregion
P1	>1.71195	2,871	164,104	66,815	16
P2	1.06750-1.1.71195	4,235	307,583	124,474	30
P3	0.5554-1.06749	11,160	459,708	186,037	45
Other Priority	0-0.5553	55,177	90,837	36,760	9
Total		73443	1,023,233	414,087	100

Table D5. Summary results of the property prioritization only within the focal areas in the Acadian Peninsula bioregion

Priority Ranking	Break Values/Scores	# of Properties	Acres	Hectares	% of bioregion
P1	>1.71195	1,111	28,841	11,672	2.8
P2	1.06750-1.1.71195	680	15,907	6,438	1.6
P3	0.5554-1.06749	466	13,910	5,629	1.4
Other Priority	0-0.5553	6,991	11,111	4,497	1.0
Total of bioregion in Focal Areas		9,248	69,740	28,234	6.8

3.3.2 Analysis Limitations

1. The GIS forest resource inventory was used to calculate weights for many of the biodiversity targets. Due to limitations of the data sharing agreement, all FRI data intersecting with industrial freehold parcels were not available for this analysis.
2. Element occurrences for species data were weighted for the entire area within a buffer around the point location. This may be overestimating or underestimating the extent of where the species occurs depending where the habitat occurs.
3. Local connectedness was generalized and did not differentiate between forest types. Therefore it did not perceive young forest adjacent to old forest as not connected. Some species may perceive this change in forest cover as a barrier to movement.

Appendix D References

- Atlantic Canada Conservation Data Centre (ACCDC) 2012. Element Occurrence records of rare taxa: observation records.
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