



Nova Scotia Wetland Conservation Policy

September 2011



Table of Contents

Introduction	1
Background	2
Policy Goal and Policy Objectives	9
Scope and Application	10
Implementation and Management Actions	11
Definitions	17



Cape Breton Bog

Photo credits: All photos taken by John Brazner, except the photo of Hurricane Juan damage on p. 6 taken by Doug Mercer (Environment Canada), the photo of Chignecto National Wildlife Area by Ducks Unlimited on p. 7, the photos of the Shelburne County salt marsh on p. 15 and bog on p. 20 taken by Reginald Newall (NSDNR) and the photo of the vernal pool on p. 24 taken by Krista Hilchey (NSE).

Introduction

The *Nova Scotia Wetland Conservation Policy* provides direction and a framework for the conservation of wetlands. It supplements and provides context to legislation, regulations and operational policies designed to protect and to guide management of wetlands in Nova Scotia. It is a comprehensive policy for the provincial government to ensure that the benefits that wetlands provide are maintained for the people of Nova Scotia.

The policy highlights the important roles wetlands play in Nova Scotia's landscapes and their value to society. It represents a commitment to managing Nova Scotia's wetlands in a consistent manner and to maintaining a high level of wetland integrity for future generations, while allowing for sustainable economic development in our communities.

The *Nova Scotia Wetland Conservation Policy* identifies what legislation, regulations and policies are currently relevant to wetland conservation, clarifies the roles and responsibilities of government and the public in relation to wetlands and makes this information more accessible to Nova Scotians. Ultimately, the policy establishes a specific policy goal and objectives intended to prevent the net loss of Nova Scotia's valuable wetlands.

Government realizes that effective wetland conservation and the prevention of a net loss of wetlands is unlikely to be achieved through policy alone and acknowledges the critical role of voluntary stewardship by Nova Scotians in the success of any wetland conservation efforts in the province.

This policy has been shaped through conversations and extensive consultation with a variety of industry, academic and nongovernmental organization stakeholders, First Nations organizations, individual Nova Scotians and federal, provincial and municipal government staff. We are grateful to them all.

What is a wetland?

As defined by the Environment Act, a wetland in Nova Scotia is land commonly referred to as a marsh, swamp, fen or bog that:

- either periodically or permanently has a water table at, near or above the land's surface, or that is saturated with water; and
- sustains aquatic processes as indicated by the presence of poorly drained soils, hydrophytic vegetation, and biological activities adapted to wet conditions.



Tangier Grand Lake Marsh

Each type of wetland has a unique set of ecological conditions. However, wetlands can be characterized generally as habitats that have water at or near the surface (<2 m deep), little or no current (water flow), plants and animals that thrive in wet conditions and peat or rich mineral soils that develop where water saturates or floods the surface at least seasonally.

For descriptions of the many different types of wetlands in Nova Scotia, see the **Definitions** section (pp. 17–24).

Background

A. Existing Regulatory Tools for Wetland Conservation in Nova Scotia

The Environment Act and the Environmental Goals and Sustainable Prosperity Act (EGSPA) contain critical provisions related to wetlands. Under these regulatory tools, Nova Scotia Environment (NSE) has the primary regulatory and enforcement responsibilities for wetlands.

- Enacted in 2007, the EGSPA legislates that government develop a policy to prevent the net loss of wetlands by the end of 2009.
- The Environment Act includes a definition of wetlands and clarifies Ministerial authority over wetlands.
- The Activities Designation Regulations are key regulations under the Environment Act that include a requirement for an approval from NSE before any alteration of a wetland (Section 5(na)).
- Environmental Assessment Regulations under the Environment Act require that undertakings which disrupt a total of two or more hectares of any wetland must undergo an environmental assessment.

Additional relevant provincial wetland legislation, regulations and policies include the following (with each responsible department identified parenthetically):

- The Agricultural Marshland Conservation Act, which allows construction for agricultural purposes on former salt marshes designated as “Marshlands” (Agriculture, NSA).
- The Off Highway Vehicle Act, which prohibits the operation of an off-highway vehicle in or on a wetland, swamp or marsh (Natural Resources, NSDNR)
- The On-site Sewage Disposal Systems Regulations (under the Environment Act), which require a clearance setback of 30.5 m for sewage disposal systems from all wetlands (NSE).
- The Provincial Subdivision Regulations (under the Municipal Government Act), which require that the location of any wetland be shown on final subdivision plans (Service Nova Scotia and Municipal Relations, SNSMR).
- The Wildlife Habitat and Watercourses Protection Regulations (under the Forests Act), which require a Special Management Zone separating forestry operations from all watercourses and wetlands with standing or flowing water (e.g., fresh and salt water marshes, ponds and estuaries). These regulations are not applicable to commercial, industrial or urban development, mining or agricultural operations, but apply in all public and private forests (NSDNR).
- The “Beaver Dam Removal Code of Practice,” which allows beaver dams to be removed or breached periodically to protect, maintain or construct infrastructure or to avoid the flooding of private or public land (NSDNR).
- The “Statement of Provincial Interest Regarding Flood Risk Areas,” which is designed to protect public safety and property and to reduce the requirement for flood control works and flood damage restoration in five identified floodplains (SNSMR).

Other support policy tools related to wetlands are available on the NSE website (<http://www.gov.ns.ca/nse/wetland/>).

There is also federal legislation and policy that is relevant to wetland conservation in Nova Scotia:

- The Federal Policy on Wetland Conservation was implemented in 1991 to promote the conservation of Canada’s wetlands and requires management of wetlands on federal lands and waters to ensure no net loss of wetland functions (Canadian Wildlife Service).
- The Policy for the Management of Fish Habitat was implemented in 1986 to support the habitat provisions of the Fisheries Act. In addition to promoting wetland conservation, particularly in Pacific and Atlantic coastal estuaries, it requires that negative effects of development activities be offset to ensure no net loss in the productive capacity of existing fish habitats (Department of Fisheries and Oceans).

B. Ecosystem Services and Functions Performed by Wetlands

Wetlands provide or support a wide range of important ecological, social and economic functions and services in our watersheds that are beneficial to Nova Scotians. Individual wetlands will typically only provide a subset of these functions and services. These include, but are not limited to:

- Maintaining watershed health by moderating flood waters, slowing runoff rates and minimizing erosion and sedimentation of adjacent lakes and streams
- Protecting human and ecosystem health by removing organic waste and bacteria and filtering excess nutrients (e.g., nitrogen and phosphorous), contaminants and silt from surface and ground water
- Buffering the impact of storm water runoff and maintaining natural drainage regimes
- Storing and sequestering carbon from the atmosphere, potentially moderating climate effects
- Protecting coastlines and coastal infrastructure from storm surges
- Contributing to the water balance and drinking water supply by storing and releasing surface water and recharging groundwater reservoirs
- Conserving biodiversity by providing important habitats for fish, wildlife and plants, often for rare or endangered species, such as our globally significant coastal plain flora
- Producing abundant and diverse plant communities that may be released, after decomposing, as essential nutrients to support fisheries and food webs in nearby rivers, estuaries and coastal waters
- Offering opportunities for recreational, scientific, aesthetic, spiritual and cultural pursuits
- Supporting natural food (e.g., wild rice, cranberries) and peat production
- Supporting medicinal and ceremonial plants important to the Mi'kmaq of Nova Scotia



Bullfrog

C. Historic Wetland Loss in Nova Scotia

Details on the amount of wetland originally present in Nova Scotia that was lost following European settlement are limited, but losses appear to have been high for some types of wetlands. For example, beginning in the early 1700s, 80% of the salt marshes along the Bay of Fundy and greater than 50% of salt marshes province-wide are estimated to have been lost, mainly to dyking by Acadians for agriculture. Losses of freshwater wetlands are also thought to be high in our more fertile regions, like the Annapolis Valley and the Northumberland Strait, along the floodplains of the Cornwallis, Annapolis and Shubenacadie Rivers, as well as near urban centres.

Unfortunately, most loss estimates for Nova Scotia are based on studies with limited analysis, precluding province-wide estimation or assessment of their accuracy. Because there has been little effort to characterize wetland loss systematically throughout the province, there is considerable uncertainty about original conditions.

D. Consequences of Wetland Loss

The loss or degradation of wetlands due to human activities results in a loss or decrease in their ability to provide ecosystem services effectively or support the full suite of ecological functions they normally perform (e.g., controlling flooding and reducing contaminants). GPI Atlantic (Genuine Progress Index for Atlantic Canada) estimates that the remaining salt marshes in Nova Scotia provide over \$400 million worth of ecosystem services to Nova Scotia communities each year, including flood and erosion control and infrastructure protection from storm surges.

In addition, since wetlands are among the most productive and diverse of all the ecosystems on earth, losing them means reduced biodiversity through the loss of local populations of fish, wildlife and plants that depend on wetlands for their habitat or food.

Nova Scotia's wetlands provide an estimated \$7.9 billion worth of benefits in ecosystem services to Nova Scotians annually, according to a GPI Atlantic study on the province's water resource values (<http://www.gpiatlantic.org/publications/abstracts/waterquality-ab.htm>). Thus the economic consequences of wetland loss can be substantial. It is becoming apparent to municipalities in other jurisdictions that conserving, constructing or restoring wetlands may be a more economical option than building water treatment systems to replace the water quality improvement functions that wetlands provide. GPI Atlantic estimates that wetland loss to development in Nova Scotia equates to about \$2 billion annually in lost ecological services like water purification, recharging drinking waters and enhancing fishery productivity.

Some of the largest economic consequences expected to be associated with wetland loss are related to sea-level rise and climate change. The most recent estimates by federal agencies and the Intergovernmental Panel on Climate Change suggest that sea

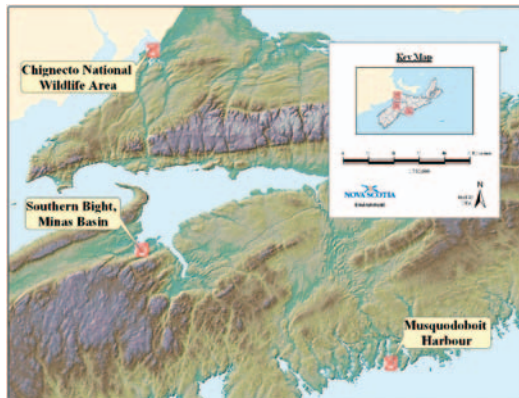
levels in Atlantic Canada will rise at least 1 m over the next century. Higher water levels are expected to result in eroding shorelines, increased flooding during storms and high tides, damage to wharves, buildings and roads and contamination of drinking water supplies with salt water. Coastal development and rising seas have already degraded salt marshes and other coastal wetlands, leaving coastlines more vulnerable to large storms.



Hurricane Juan damage in Prospect, NS

Evidence examined by the Geological Survey of Canada suggests that damage to shorelines, roads and property from Hurricane Juan in Nova Scotia in 2003 was less in areas with intact barrier beaches and salt marshes than in areas without these natural features. Juan is estimated to have cost Nova Scotia provincial and municipal governments over \$100 million, many of the costs associated with damaged coastal infrastructure. Public funds are now routinely spent on flood control in areas where salt marsh has been converted to other land uses, and a number of communities are considering multimillion-dollar seawalls for flood control.

E. Current Inventory of Wetlands in Nova Scotia



Locations of Ramsar wetlands of international importance in Nova Scotia

A province-wide wetland inventory completed by NSDNR in 2004 provides the most up-to-date estimate of the number and area of different wetland types in the province. The inventory is based upon visual interpretation of 1:10,000 scale aerial photographs taken between 1985 and 1997 and reclassified using satellite imagery (LANDSAT) from 2000–2002. The inventory is available online (<http://www.gov.ns.ca/natr/wildlife/habitats/wetlands.asp>).

Based on the 2004 inventory, Nova Scotia's 5.5 million hectares of land is comprised of 360,462 hectares (~6.5% of total land area) of freshwater

wetlands and 17,060 hectares (~0.3% of total land area) of salt marsh. Over three-quarters of our wetlands are peatlands (bogs and fens), with shrub swamps (10.1%) and salt marsh (4.5%) being the only other types comprising more than 3% of our provincial total. Our rarest types are salt and freshwater marshes and large floodplain swamps along rivers. It is important to note that forested wetlands (particularly wooded swamps) are underestimated in the inventory and comprise a larger portion of the province's land area than current totals suggest.

Salt marshes located primarily along the Northumberland, Fundy and Atlantic coasts, freshwater peatlands along the Atlantic coast and lake-edge wetlands and peatlands in southwestern Nova Scotia that support globally rare coastal plain flora are among the most ecologically significant and diverse wetlands in the province. In addition, there are three wetland complexes designated as Wetlands of International Importance under the Ramsar Convention on Wetlands (<http://ramsar.wetlands.org/>).

The three wetland complexes are:

- Southern Bight, Minas Basin (26,800 ha), which supports the largest numbers of mixed species of shoreline birds during fall migration in all of North America
- Musquodoboit Harbour (1,925 ha), a salt marsh with extensive eelgrass beds that provide cover and nutrients to support abundant invertebrates, coastal fisheries and food webs and wintering water birds
- Chignecto National Wildlife Area (1,025 ha), in the southeast portion of the Tantramar Marshes, a salt marsh dissected by numerous tidal creeks and freshwater wetlands that play an important role in supplying nutrients to coastal waters and moderating storm surges, as well as providing staging areas for migrating waterfowl.



Chignecto National Wildlife Area near Amherst Point

F. Wetland Management

NSDNR has the primary responsibility for managing wetland habitat and biodiversity within the provincial government and through partnerships with other levels of government, industry, non-government agencies and private land owners. One key partnership is the Nova Scotia Eastern Habitat Joint Venture (NS-EHJV). Since 1989, NSDNR, along with other provincial departments (NSE and NSA) and other partners (Ducks Unlimited Canada, Environment Canada's Canadian Wildlife Service and the Nature Conservancy of Canada) have cooperated in the NS-EHJV to provide \$24,800,000 for wetland conservation through habitat securement (38,600 hectares), enhancement (11,100 hectares) and management (14,700 hectares). The main focus has been on restoring or creating wetlands in areas where wetland loss has been the most severe and on securing significant wetlands through purchase or conservation agreements.

In the future, we plan to continually evaluate wetland conservation tools and practices from other provincial, federal and U.S. state jurisdictions and to adopt or adapt those deemed most efficient and effective for Nova Scotia. When feasible and effective for Nova Scotia, we will align wetland conservation tools and practices to increase consistency and clarity in wetland management throughout the Maritime provinces and across Canada.



White-tailed deer drinking near a riparian shrub swamp



Great blue heron fishing in a salt marsh at Martinique Beach

Policy Goal

To prevent the net loss of wetland in Nova Scotia through wetland conservation practices that integrate the need for wetland protection with the need for sustainable economic development, now and in the future.

Policy Objectives

- To manage human activity in or near wetlands, with the goal of **no loss** in Wetlands of Special Significance and the goal of preventing **net loss** in area and function for other wetlands
- To promote wetland protection and stewardship and to increase awareness of the importance of wetlands in the landscape
- To promote a long-term net gain in wetland types that have experienced high historic losses, in order to restore beneficial ecosystem services and functions across the province
- To encourage the use of buffers to better ensure the integrity of wetlands adjacent to development (i.e. residential, commercial, industrial) and agricultural, mining and forestry operations

Scope and Application

This policy applies to all freshwater and certain tidal wetlands in Nova Scotia (those commonly referred to as salt marshes and coastal saline ponds, including barachois ponds and tidal lagoons) as described in this policy, with the following exceptions.

An approval is not required for altering:

- wetlands on federal lands (these are managed under the Federal Policy on Wetland Conservation);
- wetlands less than 100 square metres in total area;
- wetlands constructed specifically for wastewater or stormwater treatment;
- wetlands created by humans on upland habitats not for the purpose of fulfilling compensation requirements under Wetland Alteration Approvals (e.g., excavated ponds);
- wetlands designated as “Marshlands” under the Agricultural Marshland Conservation Act as agricultural land;
- wetlands within agricultural drainage ditches;
- wetlands that develop as the unintended result of urban, commercial, industrial or agricultural construction projects completed less than 20 years before the current calendar year.

An approval is not required for:

- linear developments that are less than 10m wide and less than 600 square metres in total area (such as forest access roads, secondary roads, and driveways) through shrub or wooded swamps that are not classified as “Wetlands of Special Significance”;
- periodic or emergency maintenance for public safety or protection of adjacent properties and infrastructure in wetlands that develop within the medians or drainage ditches of transportation corridors or those within the footprint of existing utility corridors or electrical generation, transmission and distribution infrastructure;
- harvesting trees or mowing agricultural fields in a wetland (best management practices should always be used to minimize damage).

Although government recognizes that many wetlands, such as vernal pools and small urban ponds, that are less than 100 square metres in size may play important roles in the landscape and strongly encourages avoidance of these and all wetlands when siting developments, this policy does not apply unless they are listed as Wetlands of Special Significance.

If a wetland is part of a wetland complex (connected by obvious water flows to nearby wetlands), the overall size of the complex will be used to determine if the policy applies.



Late fall vernal pool near Herring Cove

Natural events, such as storms, that affect the flow of water can lead to wetland formation over the course of several years. It is the responsibility of all landowners to be aware of this potential and manage their land appropriately based on their intended future use. For example, if property owners identify a drainage problem caused by a storm on land that they intend to develop, they may wish to address standing water to avoid conditions that might create a wetland over time.

Implementation and Management Actions

Objective 1

To manage human activity in or near wetlands, with the goal of no loss in Wetlands of Special Significance and the goal of preventing net loss in area and function for other wetlands.

A. Wetlands of Special Significance (WSS)

Government will consider the following to be WSS:

- all salt marshes
- wetlands that are within or partially within a designated Ramsar site, Provincial Wildlife Management Area (Crown and Provincial lands only), Provincial Park, Nature Reserve, Wilderness Area or lands owned or legally protected by non-government charitable conservation land trusts

- intact or restored wetlands that are project sites under the North American Waterfowl Management Plan and secured for conservation through the NS–EHJV
- wetlands known to support at-risk species as designated under the federal Species At Risk Act or the Nova Scotia Endangered Species Act
- wetlands in designated protected water areas as described within Section 106 of the Environment Act

Government will develop a process for classifying additional wetlands or wetland types as WSS. Among the wetland characteristics, functions and services to be considered during this process are whether the area:

- supports a significant species or species assemblages (e.g., coastal plain flora),
- supports high wildlife biodiversity,
- has significant hydrologic value, or
- has high social or cultural importance.

Government will not support or approve alterations proposed for a WSS or any alterations that pose a substantial risk to a WSS, except:

- alterations that are required to maintain, restore, or enhance a WSS;
- alterations deemed to provide necessary public function, based on an Environmental Assessment (if required) with public review or other approvals (e.g., Wetland Alteration Approval) as appropriate.

B. Other Wetlands

Government will:

- update the provincial wetland inventory to assist government and the public in identifying wetlands around the province, with the intent of eventually being able to use the inventory as the primary source for wetland identification. The inventory must not be used as the only source for identifying wetland locations or be considered a substitute for obtaining field confirmation of wetland locations when evaluating the suitability of a site for any particular project. DNR wet areas mapping tools (<http://www.gov.ns.ca/natr/forestry/GIS/>) can also be used to help identify and predict where wetlands are likely to be located during the project planning phase.
- require all those proposing projects that will negatively affect wetland areas or function to submit an application through the Wetland Alteration Approval process and/or Environmental Assessment process, as appropriate and adhere to the mitigation sequence (see definitions) to achieve the objective of preventing net loss.

- not approve the alteration of wetlands that have been restored, enhanced, created or protected as part of compensation for alterations to other wetlands, except when deemed to provide necessary public function as described for WSS or when maintenance is necessary to maintain, restore or improve function.
- through NSE, establish and maintain appropriate procedures and public information to clarify the approval process.



Riparian fen-swamp complex in the Blue Mountain–Birch Cove Lakes Wilderness

Objective 2

To promote wetland protection and stewardship and increase awareness of the importance of wetlands in the landscape.

A. Protection and Stewardship

Government will:

- use a variety of strategies to conserve wetlands, which may include: acquisition, enhancement and restoration of wetlands using funds obtained through the NS–EHJV Program and other cooperative programs; conservation easement agreements; stewardship agreements; tax incentives for maintaining ecosystem services; and ecologically sensitive land gifts.
- retain ownership of all WSS that are currently in Crown or Provincial ownership, unless it is deemed necessary for public function to do otherwise.
- work with municipalities to promote wetland conservation within municipal planning efforts and bylaws.

B. Awareness and Education

Government will:

- promote and assist in the development of wetland awareness and education programs that target the general public, students, landowners and other private sector stakeholders.
- support and encourage the development of cooperative educational and training programs with stakeholders, particularly those programs related to wetland delineation and functional assessment, as well as to the economic value of retaining wetlands within urban and commercial development settings.
- facilitate the exchange of information and expertise on wetland conservation practices and programs across provincial and federal government offices and departments, First Nations organizations and municipalities. This will raise awareness about the objectives of this policy, help identify and coordinate the most effective approaches across organizations and promote collaboration so as to achieve common objectives efficiently.

Objective 3

To promote a long-term net gain in wetland types that have experienced high historic losses, in order to restore beneficial ecosystem services and functions across the province.

The focus of the net gain objective is on wetlands, such as salt marshes, that have experienced high historic losses. The intent is to gradually regain some of the important

ecosystem services (e.g., storm surge and shoreline erosion protection) and functions lost when these wetlands were converted to other uses (functions such as the provision of nutrient subsidies to coastal food webs).

Government will:

- help achieve gains by providing assistance with the coordination and funding of restoration efforts, potentially using funds such as the Environmental Trust Fund or the Habitat Conservation Fund to support these projects.
- collaborate with stakeholders to provide an assessment that identifies where the loss of particular wetland types was historically high and to prioritize potential restoration sites for all regions of the province. High priority sites will include those in watersheds and regions where wetland loss has been high and ecosystem services or functions are below thresholds necessary to maintain watershed health.



Salt marsh complex in Shelburne County

Objective 4

To encourage the use of buffers to better ensure the integrity of wetlands adjacent to development (i.e. residential, commercial, industrial) and agricultural, mining and forestry operations.

Government will encourage buffers between wetlands and developments and between wetlands and agricultural operations that are similar to those required as “Special management zones” for forestry operations under the Wildlife Habitat and Watercourses Protection Regulations. To this end, the variety of tools available include:

- educating private landowners, land developers, municipal land-use planners and farmers about beneficial management practices (e.g., the Environmental Farm Stewardship Program) for various development activities adjacent to wetlands.
- incorporating the use of buffers and Wetland Protection Plans in Environmental Assessment approvals for projects with a high potential to have a negative impact on wetlands.



Kidston Pond near Spryfield

Definitions

Avoidance

The prevention of adverse effects to wetlands, by choosing an alternate project, design or site for development. It is considered the first, best choice of mitigation alternatives.

Buffer

An area around a wetland within which limited or no development or physical alteration of the landscape occurs.

Conservation

The protection and management of wetlands to assure optimum sustained ecological, economic and social benefits.

Compensation

Actions taken as the last step in the sequence of wetland mitigation, consisting of measures taken to offset losses of wetland and of wetland functions and services which could not be avoided.

Development

The erection, construction, alteration, placement, location, replacement or relocation of, or addition to, a structure and a change or alteration in the use made of land or structures.

Ecosystem Services

The benefits people obtain from ecosystems. These include provisioning (e.g., food, fresh water, natural medicines, fiber, fuel), regulating (e.g., climate, erosion and flood regulation, water supply purification and maintenance of flow regimes) and cultural services that directly affect people (e.g., tourism, heritage and recreational, educational, scientific and aesthetic opportunities) and the supporting services needed to maintain other services (e.g., nutrient and water cycling, photosynthesis, soil formation).

Enhancement

The implementation of projects conducted in existing wetlands to achieve specific management objectives or to promote conditions that previously did not exist. Such projects increase one or more wetland functions or services. Enhancement may involve trade-offs that result in a positive change in one wetland function or service and a negative change in another.

Hydrophytic Vegetation

Plant life that is adapted to and thrives in wet conditions.

Minimization

The process of reducing the adverse effects of development on the functions and services of wetlands at all project stages (planning, design, implementation and monitoring).

Mitigation Sequence

A process for achieving wetland conservation through the application of a hierarchical progression of alternatives to the adverse effects of alterations. These alternatives include:

- a) *Avoidance* of adverse effects
- b) *Minimization* of unavoidable adverse effects
- c) *Compensation* for adverse effects that cannot be avoided

Monitoring and an adaptive approach are essential **at all three sequence stages** to ensure net loss is prevented.

Necessary Public Function

A service, utility, role or capacity deemed essential to Nova Scotians. Such functions involve projects that provide public service on a provincial scale. They include public transportation projects, public infrastructure, linear pipeline or transportation corridors or electrical supply infrastructure, projects necessary for public safety and the protection of adjacent properties and infrastructure and land transactions authorized through an Order of Executive Council.

Private Sector Stakeholders

Those members of the public who have an interest in a wetland. They include, but are not limited to, individuals, non-government organizations, groups, associations, educational institutions, researchers, businesses, not-for-profit organizations and landowners.

Protection

The long-term guardianship of a wetland carried out with the assistance of a range of tools including, but not limited to, direct acquisition, policy, legislation, land stewardship programs, bequests, conservation easements and donations.

Restoration

The re-establishment of previously existing wetland and its functions and services by human intervention at a site where a wetland no longer exists, or exists only in a highly degraded state.

Special Management Zones

Those areas of forest adjacent to a watercourse required to be maintained in accordance with Sections 5 and 6 of the Wildlife Habitat and Watercourses Protection Regulations, under the Forests Act, to protect the watercourse and bordering wildlife habitat from the effects of forestry operations. A special management zone is similar to a buffer. (See definition for “Buffer.”)

Stewardship

The process of caring for the land in a responsible way to ensure that healthy ecosystems are passed on to future generations.

Sustainable Development

A pattern of resource use that entails meeting the needs of the present without compromising the ability of future generations to meet their own needs. It implies using a community’s resources wisely within a framework that integrates environmental, economic and social factors.

Watercourse

The bed and shore of every river, stream, lake, creek, pond, spring, lagoon or other natural body of water and the water therein, within the jurisdiction of the Province, whether it contains water or not, and all ground water.

Wetland

An area commonly referred to as marsh, swamp, fen or bog that either periodically or permanently has a water table at, near or above the land’s surface or that is saturated with water. Such an area sustains aquatic processes as indicated by the presence of poorly drained soils, hydrophytic vegetation and biological activities adapted to wet conditions.

Wetland Classes (for more detailed descriptions see the Canadian Wetland Classification System at <http://www.portofentry.com/Wetlands.pdf>)

Bog

wetlands characterized by the accumulation of *Sphagnum* moss as peat. The bog surface, which is raised or level with the surrounding terrain, is virtually unaffected by surface runoff or groundwater from the surrounding terrain. Generally the water table is at or slightly below the bog surface.

As natural processes raise the bog surface, the water table in the bog rises relative to the elevation of the water table at the edges of the bog. Precipitation, fog and snowmelt are the primary water sources. Bog waters are low in dissolved minerals and acidic (usually between pH 4.0 and 4.8).



Shelburne area bog

Bogs may be treed (black spruce and tamarack are common) or treeless, and they are usually covered with *Sphagnum* spp. and ericaceous shrubs such as leatherleaf, huckleberry, lambkill and Labrador tea. Cranberry, crowberry, pitcher-plant and cotton-grass are common in more open bogs.

Coastal Saline Pond

a small body of saline-to-brackish water, commonly found behind a barrier beach or bar formed of sand or cobble deposited by wave action. Such a pond receives saline water by storm surge or from spray, or by regular or periodic opening to the ocean. Saline ponds include bodies of water often referred to as *barchois ponds* and *tidal lagoons*. Typical saline ponds are isolated from breaching and have no outlet; their saline influence comes from spray and storm surges. *Barchois ponds* exist where the barrier is occasionally breached and thus open to sea waves; they also receive saline from spray and storm surges. *Tidal lagoons* are semi-enclosed and receive saline from regular or spring tides. *Barchois ponds* and *tidal lagoons* may also receive fresh water from streams, while typical saline ponds receive fresh water only from overland flow and groundwater.

Fen

ground or surface water-fed peatlands saturated with water and typically dominated by sedges and brown mosses. Groundwater and surface water movement are common characteristics that distinguish fens from bogs. Surface flow may be directed through channels,



Riparian fen

pools and other open water bodies. The vegetation in fens is more diverse than in bogs and is closely related to the depth of the water table and to water chemistry. In general, sedges and mosses dominate wetter fens, in which the water table is above the surface. Shrubby trees, such as tamarack, birch and willow, are prominent in drier fens. Black spruce is common in the driest fen sites, where moss hummocks provide microhabitats above the water table.

Marsh

a shallow-water wetland with water levels that fluctuate daily, seasonally or annually, occasionally drying up or exposing sediments. Marshes receive their water from the surrounding watershed as surface runoff, stream inflow, precipitation and groundwater discharge, as well as from longshore



Emergent lacustrine marsh

currents, storm surges and tidal action. High nutrient levels give rise to high vascular plant productivity and high decomposition rates at the end of the growing season.

Marshes that are seasonally dry or exposed to high energy currents or tides usually accumulate little organic matter, but wetter, more stable and permanently saturated marshes, such as in lakeshore embayment and groundwater-fed basin marshes, can accumulate organic material to depths around 50 cm. Emergent aquatic plants (macrophytes), such as rushes, reeds, grasses and sedges, as well as floating and submerged aquatic macrophytes and non-vascular plants such as brown mosses, liverworts and macroscopic algae, are typical of marshes. Deep, shallow and shoreline marshes are typically *nontidal* and *freshwater*, whereas salt marshes are *tidal* and *saline*.

Deep marsh — wetlands with an average water depth between 15 cm and 1 m during the growing season. Emergent marsh vegetation (e.g., rushes, bulrushes) is usually dominant, with surface and submergent plants present in deeper areas.

Shallow marsh — wetlands often dominated by robust emergent plants (cattails, arrowhead), with an average water depth less than 15 cm during the growing season. *Wet meadow* habitats, usually dominated by sedges and grasses, are typically the driest of the shallow marshes and often transitional to shrub and wooded swamps adjacent to the marsh. Surface water may be absent during late summer and abnormally dry periods. Floating-leaved and submerged plants can be present in deeper areas.

Shoreline marsh — wetland areas in or along lakes, ponds, rivers and streams, with water less than 2 m deep and scattered emergent vegetation. These areas often have floating or submerged aquatic plants and mucky or mineral substrates. They are also referred to as *lacustrine* (along lakes and ponds) or *riparian* (along streams and rivers) *marshes*. The deeper portions of these habitats are also referred to as *shallow open water wetlands*.

Salt marsh — vegetated wetland that is flooded regularly by tidal water, or influenced by salt spray or seepage, making the water and soil saline or brackish. Tidal channels and ponds may be present. Salt-water cordgrass (*Spartina alterniflora*) and other saline-tolerant grasses and sedges often



Salt marsh

dominate low marshes, which are flooded regularly. High marshes are often flooded

only during extreme tides and are typically dominated by salt meadow cordgrass (*Spartina patens*). These are extremely productive wetlands that provide many critical environmental, societal and economic functions and services.



Floodplain swamp

Swamp

wetlands dominated by trees and shrubs, with generally over 30% cover in woody species, wood-rich peat or mineral soils and water tables typically at or below the surface. They may be seasonally or permanently flooded with as much as 30 cm of water. Swamps are generally not as wet as marshes, fens and the open bogs. They are common along the drier portions of floodplains and riparian areas of rivers and streams. Nutrient regimes are highly variable and pH levels range from around 4.5 to above 7.0. In shrub swamps, shrubs occupy more than 50 percent of the habitat, with sedges as the typical ground cover. Grasses, sedges or rushes commonly occupy open areas. In wooded swamps, trees dominate, but there are usually several other levels of vegetation, including shrubs, ferns and a variety of herbaceous plants. Trees and many shrubs grow on slightly drier areas, while marsh emergents and ferns occupy the vernal pools. Along with *treed bogs* and *fens*, *wooded swamps* are among Nova Scotia's most common *forested wetlands*.

Vernal Pools

these are small (typically less than 0.5 ha), shallow wetlands that lack permanent inlet or outlet streams and often dry out in the summer. They provide critical breeding habitat for frogs, salamanders, insects and fairy shrimp and feeding and drinking sites for birds, mammals, turtles and other wildlife.



Pictou area vernal pool

Wetland Delineation

The process of carrying out on-site field investigations to determine the precise boundaries of a bog, fen, marsh, swamp, etc., based on existing maps and field observations of hydrology, vegetation and soils.

Wetland Functions

Biophysical processes that take place within a bog, fen, marsh, swamp, etc. These can be characterized apart from any human context (e.g., fish and waterfowl habitat, refuge for rare and endangered species, maintenance of biological diversity and the production of energy to support food webs and nutrient retention), but may provide indirect human benefits.

Wetlands of Special Significance

Areas of bog, fen, marsh, swamp, etc. that play particularly important roles in providing ecosystem services or functions (e.g., supporting rare or migratory species, protecting drinking water supplies, maintaining watershed health). These areas exist on local, watershed, regional, provincial, national and international scales (see **Objective 1** for a description of criteria for classifying wetlands as WSS).