

Final

Programmatic Environmental Impact Statement For Northern Border Activities

Section 7: New England Region



July 2012

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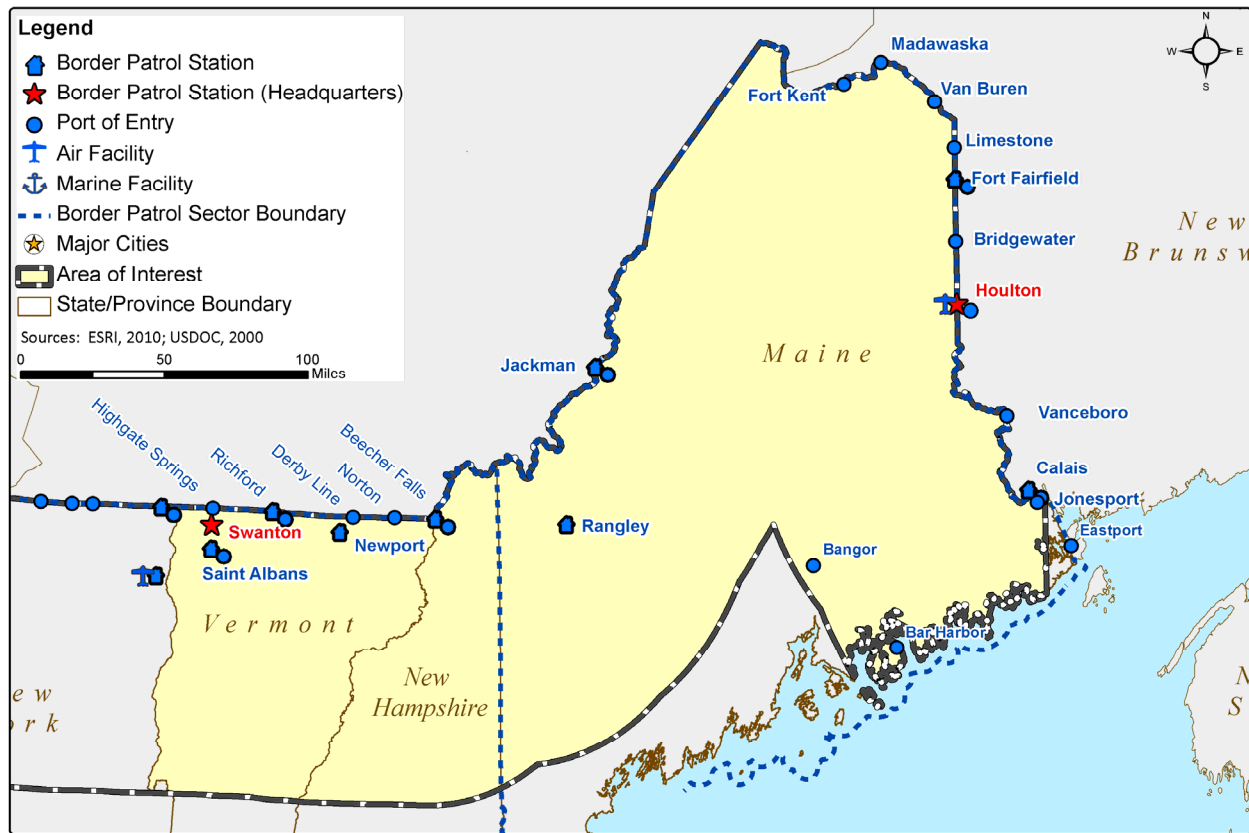
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7 NEW ENGLAND REGION

7.1 INTRODUCTION

This chapter analyzes potential environmental effects in the New England Region arising from U.S. Customs and Border Protection (CBP) actions related to its homeland-security mission. The chapter will address ongoing activities and long-range planning for security enhancement measures. The New England Region includes the areas of Maine, New Hampshire, and Vermont that fall within about 100 miles of the northern border. Figure 7.1-1 displays the territory and CBP facilities of the region.

Figure 7.1-1. The New England Region and CBP Facilities



The northern border environment in the New England Region has a wide variety of habitats and terrain types.

In Maine, these habitats include extensive areas of boreal coniferous forest, broad-leaved hardwood forests, mixed coniferous and deciduous stands, agricultural land, rolling hills, wetlands, glacial features, marine and estuarine deepwater habitats, marshes, beaches, intertidal flats, rocky coastal shorelines, and human developments of various densities. Major rivers that run through Maine include the Allagash, Aroostook, Narragaus, St. Croix, and St. John Rivers. Important lakes include Mooselookmeguntic, Flagstaff, Brassua, and Moosehead Lakes.

Much of the habitat in New Hampshire is rugged, with coniferous forests, deciduous forests, mixed stands, mountains, alpine meadows near timberline, rolling hills, valleys, agricultural

land, forested and scrub-shrub wetlands, and human developments of various densities. Major rivers that run through New Hampshire include the Androscoggin, Connecticut, Pemigewasset, Saco, Merrimack, and Ammonoosuc Rivers. Important lakes include the Connecticut Lakes, Lake Winnepesaukee, Ossipee Lake, Sunapee Lake, Newfound Lake, and Lake Umbagog.

Habitats in Vermont include coniferous forests, deciduous forests, mixed stands, mountains, alpine meadows near timberline, rolling hills, valleys, agricultural land, forested wetlands, and human developments of various densities. Major rivers that run through Vermont include the Connecticut, Missisquoi, Passumpsic, White, and Winooski Rivers. Important lakes include Lake Champlain and Lake Memphremagog.

Most land in the New England Region is owned and managed privately, but there is also public land including state-owned land (Baxter State Park in Maine, many smaller state parks in New Hampshire and Vermont), national forests (White Mountain, Green Mountain), national parks (Acadia), national wildlife refuges (Lake Umbagog, Missisquoi), the Appalachian and Long Trails, and Native American lands (belonging to the Passamaquoddy, Penobscot, Maliseet, and Micmac Tribes).

U.S. Border Patrol in the New England Region

The U.S. Border Patrol (USBP) in the New England Region employs several hundred agents who operate from 10 stations spread over approximately 700 miles of the northern border (see Figure 7.2-1). The border in the New England Region is mainly rural and remote, consisting of pasture land, forest, and water. The International Boundary Commission maintains a clear cut to 60 feet on the U.S. side of the border (“the slash”), which defines the border wherever it passes through forest. In some areas, there are roads along the border, none of which is restricted. There are no vehicle barriers or fencing. Surveillance of the border employs diverse use of on- and off-road vehicles and snowmobiles as well as pedestrian, aerial, and waterborne patrols. CBP maintains partnerships with governmental agencies (Federal, state, and local law enforcement as well as Canadian authorities) and private entities (communities, landowners, interboundary groups) for both law enforcement and intelligence missions.

The region’s 10 Border Patrol stations (BPS) are divided into two sectors: Houlton in Maine and Swanton in New Hampshire and Vermont. All stations have canine teams. An average of 1,000-1,500 interdictions takes place per year. Most interdictions involve people who should not be in the United States (because of criminal history, failure to leave as required, or presence without admission from Canada); there is also a small amount of smuggling. About \$2 million in cash is seized every year, usually from narcotics trafficking. Occasionally weapons and drugs are seized.

USBP within the region deploy a combination of static permanent surveillance, ground radar, and acoustic sensors, with repeaters to provide extended line-of-sight coverage. Forward operating bases (FOBs) are deployed in parts of this region, as are mobile traffic checkpoints in coordination with state departments of transportation.

Office of Air and Marine in the New England Region

The CBP Office of Air and Marine (OAM) in Houlton, Maine deploys from Houlton International Airport. The Plattsburgh, New York OAM Center works with the Swanton USBP

and operates out of the Plattsburgh Air Force Base, now Plattsburgh International Airport. Agents conduct regular aerial patrols and mission-specific aerial surveillance of the border and surrounding areas. Agents respond to USBP requests and act independently as well. Agents also provide both fixed-wing and rotary aviation resources to specific criminal investigations that take place on the ground away from the border. They use night-vision goggles, forward-looking infrared, digital aerial video, airborne radar platforms, and video downlinks.

The USBP manages marine operations in the New England Region.

Office of Field Operations in the New England Region

Each CBP Office of Field Operations (OFO) region includes one or more large ports of entry (POEs) that may oversee smaller ports of varying sizes. Houlton, the largest POE in Maine, oversees 13 other POEs and processes about 10,000 trucks and 300,000 cars per month. It is capable of processing all cargo but focuses mostly on lumber, agricultural products, and seafood. There are three regions in Maine: Houlton, Calais, and Jackman. Each of these regions oversees ports of different sizes. The service port is in Portland, Maine, and the field office is in Boston. Service ports are OFO locations that have a full range of cargo processing functions, including inspections, entry, collections, and verification.

There are no POEs along the border in New Hampshire. Vermont has five small POEs and a service port in St. Albans.

7.2 AIR QUALITY

7.2.1 INTRODUCTION

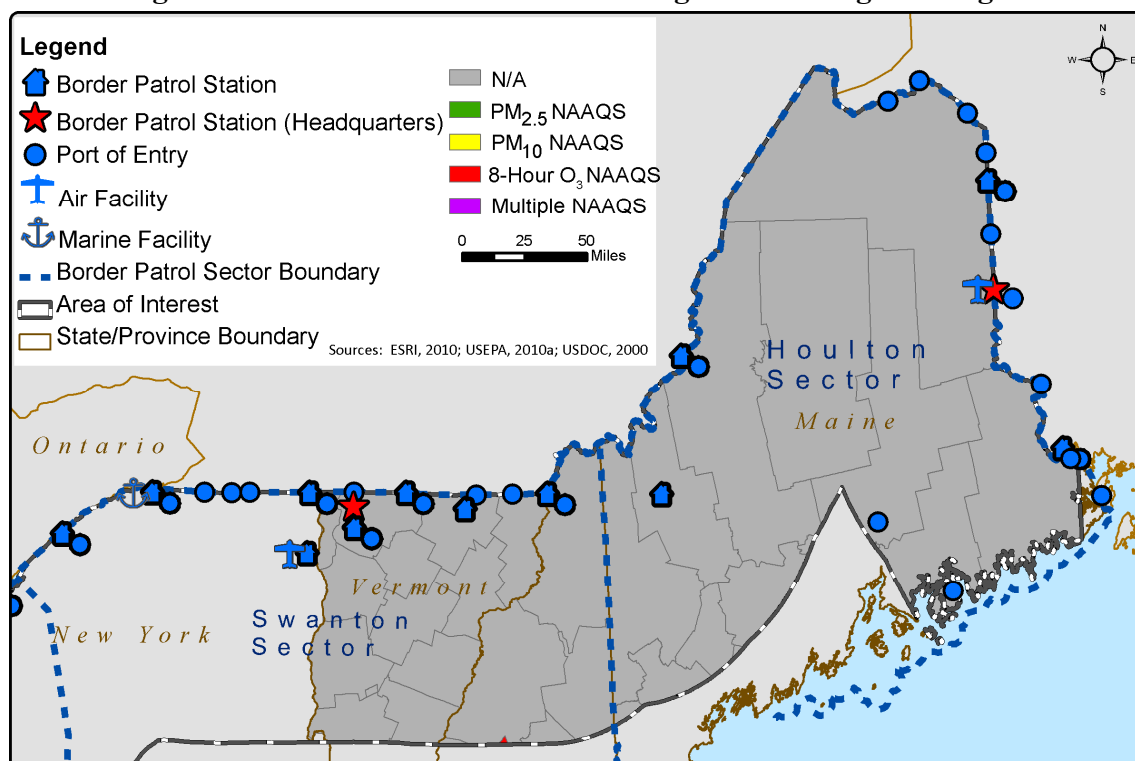
The New England study area contains many air quality control regions (AQCR) and Class I areas that could experience impacts due to the proposed action and alternatives in this Programmatic Environmental Impact Statement (PEIS). (Class I areas are Federal lands, designated by Congress as of August 7, 1977, that have air quality restrictions under Section 162(a) of the Clean Air Act (CAA) that are more stringent than the standards that apply elsewhere.) However, the mere presence of a sensitive area, such as a nonattainment, maintenance, or Class I areas, does not guarantee that that area would be impacted by CBP activities. Chapter 3, Section 3.2 provides more detailed information on national standards and requirements used to describe and determine effects to air quality resources.

7.2.2 AFFECTED ENVIRONMENT

7.2.2.1 National Ambient Air Quality Standards and Attainment Status

Nonattainment areas within 100 miles of the border are shown in Figure 7.2.2-1. There are no nonattainment areas in the New England Region (USEPA, 2010). Federal regulations designate AQCRs that were once classified as nonattainment but have lowered levels of pollutants through the use of regional controls, as maintenance areas. Figure 7.2-2 shows maintenance areas throughout Maine. The larger area of PM₁₀ (particulate matter that is 10 micrometers in diameter and smaller) in northern Maine is attributed to the use of a sand/salt mixture as a winter skid control measure, which has been changed in some locations to a calcium-chloride/salt mixture. This reduction in the use of sand promoted this area from nonattainment to maintenance area designation (USEPA, 1995). A complete list of nonattainment and maintenance areas organized by state and county is located in Appendix J.

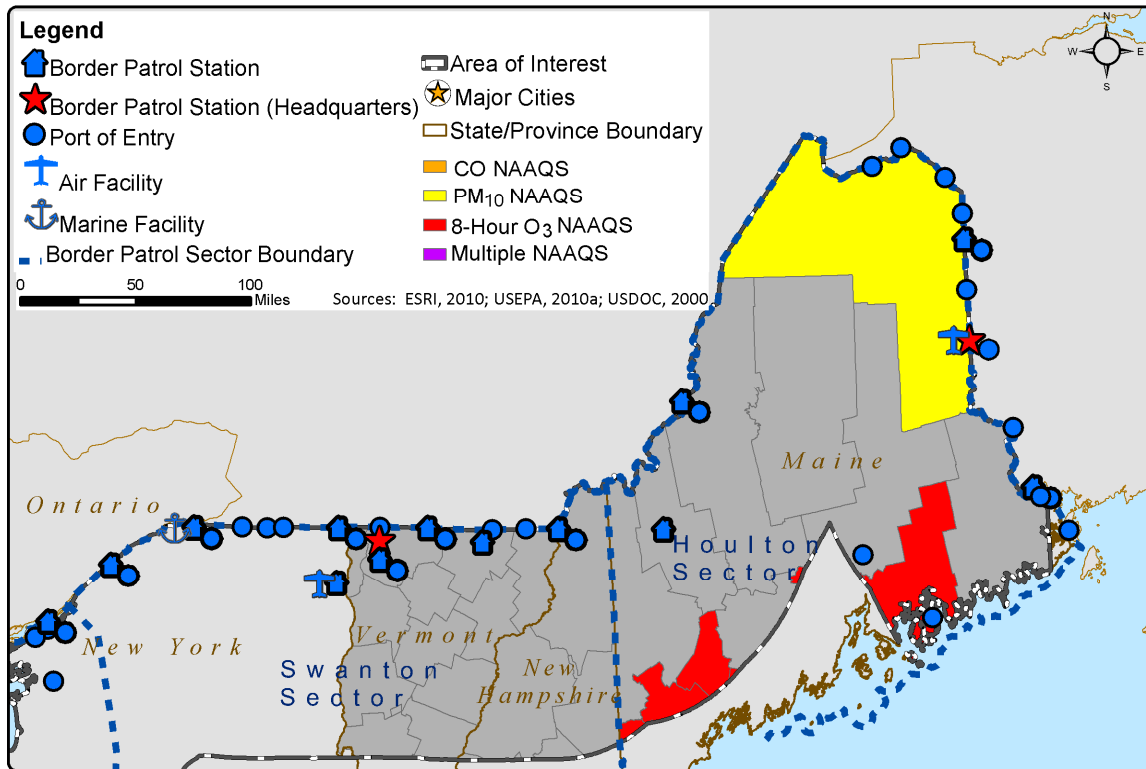
Figure 7.2-1. Nonattainment Areas along the New England Region



Notes:

NAAQS: National Ambient Air Quality Standards

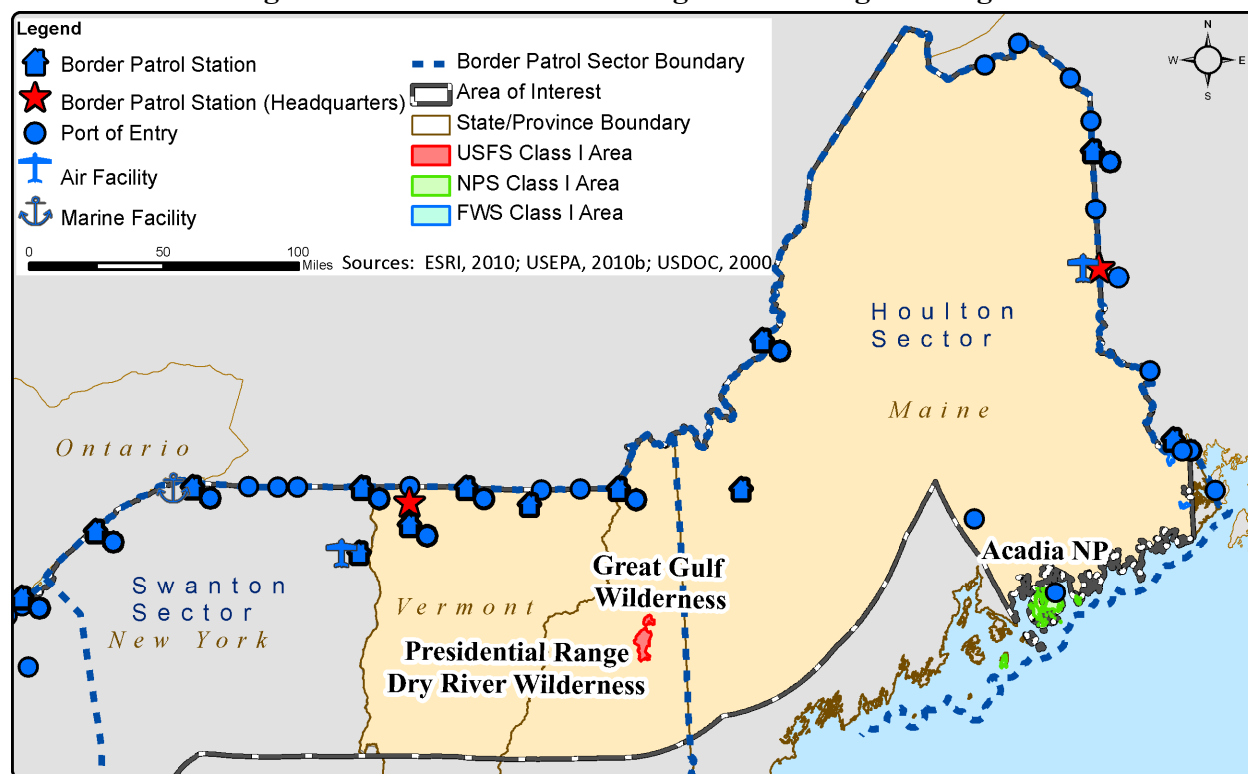
PM_{2.5}: Particulate matter that is 2.5 micrometers in diameter and smaller

Figure 7.2-2. Maintenance Areas along the New England Region

7.2.2.2 Class I Areas

The CAA protects areas where air quality exceeds national standards established by the Environmental Protection Agency (USEPA) by measures to prevent significant deterioration (PSD) of air quality. The more stringent restrictions in effect in Class I areas are largely meant to maintain unimpaired visibility in areas such as “national parks, national wilderness areas, national monuments, national seashores, and other areas of special natural, recreational, scenic, or historic value.” In general, “clean air areas” are protected through ceilings on the additional amounts of certain air pollutants over a baseline level. The PSD increment amounts vary based on the area’s classification. Class I areas and major CBP facilities in the New England Region are shown on the map in Figure 7.2-3.

Figure 7.2-3. Class I Areas along the New England Region



Notes:

USFS: United States Forest Service

NPS: National Park Service

USFWS: U.S. Fish and Wildlife Service

7.3 BIOLOGICAL RESOURCES

7.3.1 INTRODUCTION

As with other topics in this PEIS, the programmatic approach for describing the existing biological resources is driven by the planning objective of the document and the potential for actual impacts. The description of the affected environment presented below focuses on the following areas:

The New England Region falls within portions of the following states: Vermont, New Hampshire, and Maine, and can be divided biologically into three ecoregions:

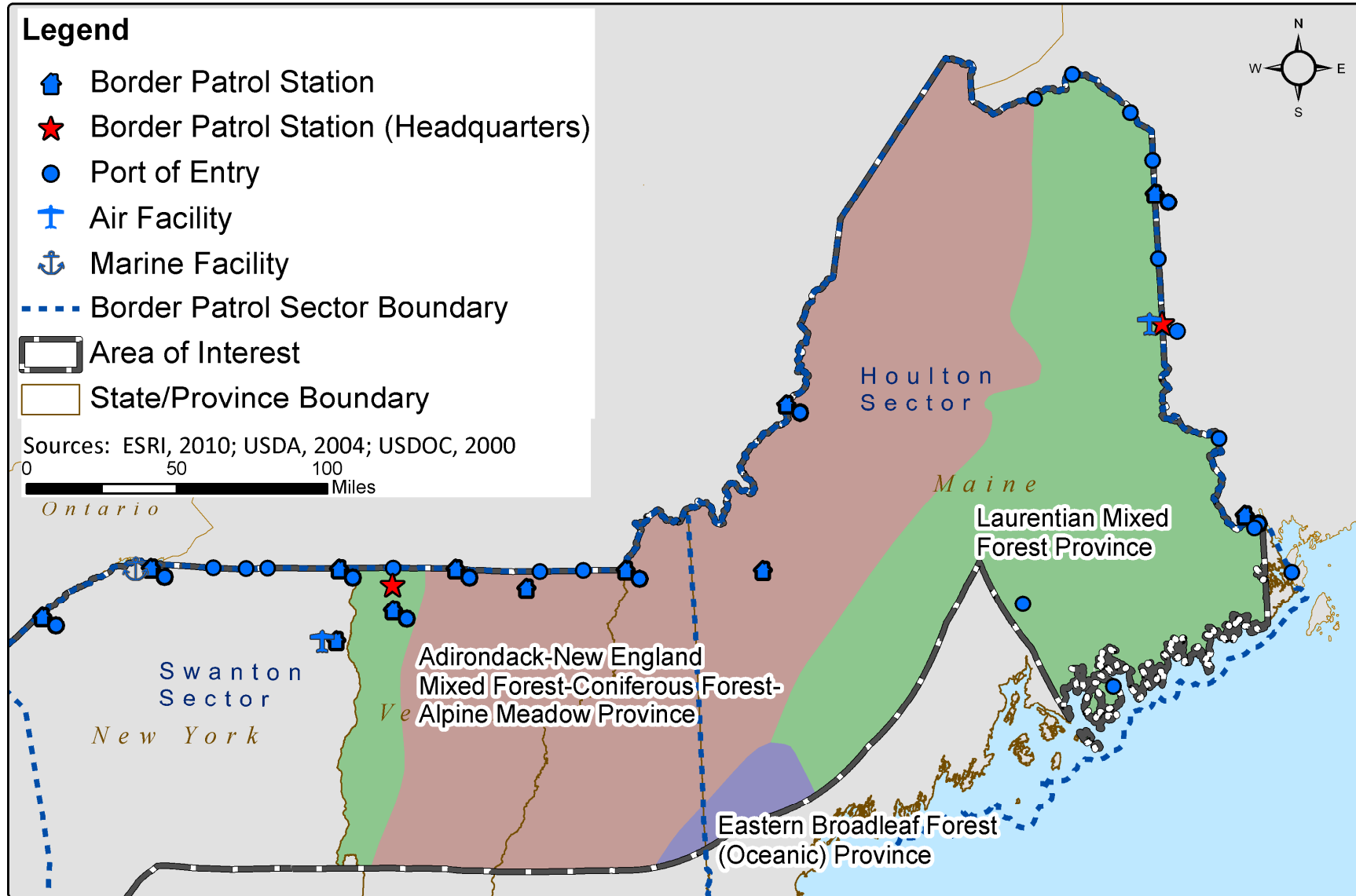
- Laurentian Mixed Forest;
- Adirondack-New England Mixed Forest Coniferous Forest-Alpine Meadow; and,
- Eastern Broadleaf Forest (Oceanic) ecoregions.

Figure 7.3-1 provides a map of these ecoregions. For a complete description of each ecoregion, refer to Appendix L.

Map resources for the ecoregion maps presented in this section were developed from the U.S. Census Bureau (USCB), U.S. Geological Survey (USGS), and ESRI databases.

Each ecoregion has a unique set of biological, climatic, and topographical characteristics along with unique challenges and opportunities for CBP.

Figure 7.3-1. Ecoregions of the New England Region



7.3.2 AFFECTED ENVIRONMENT

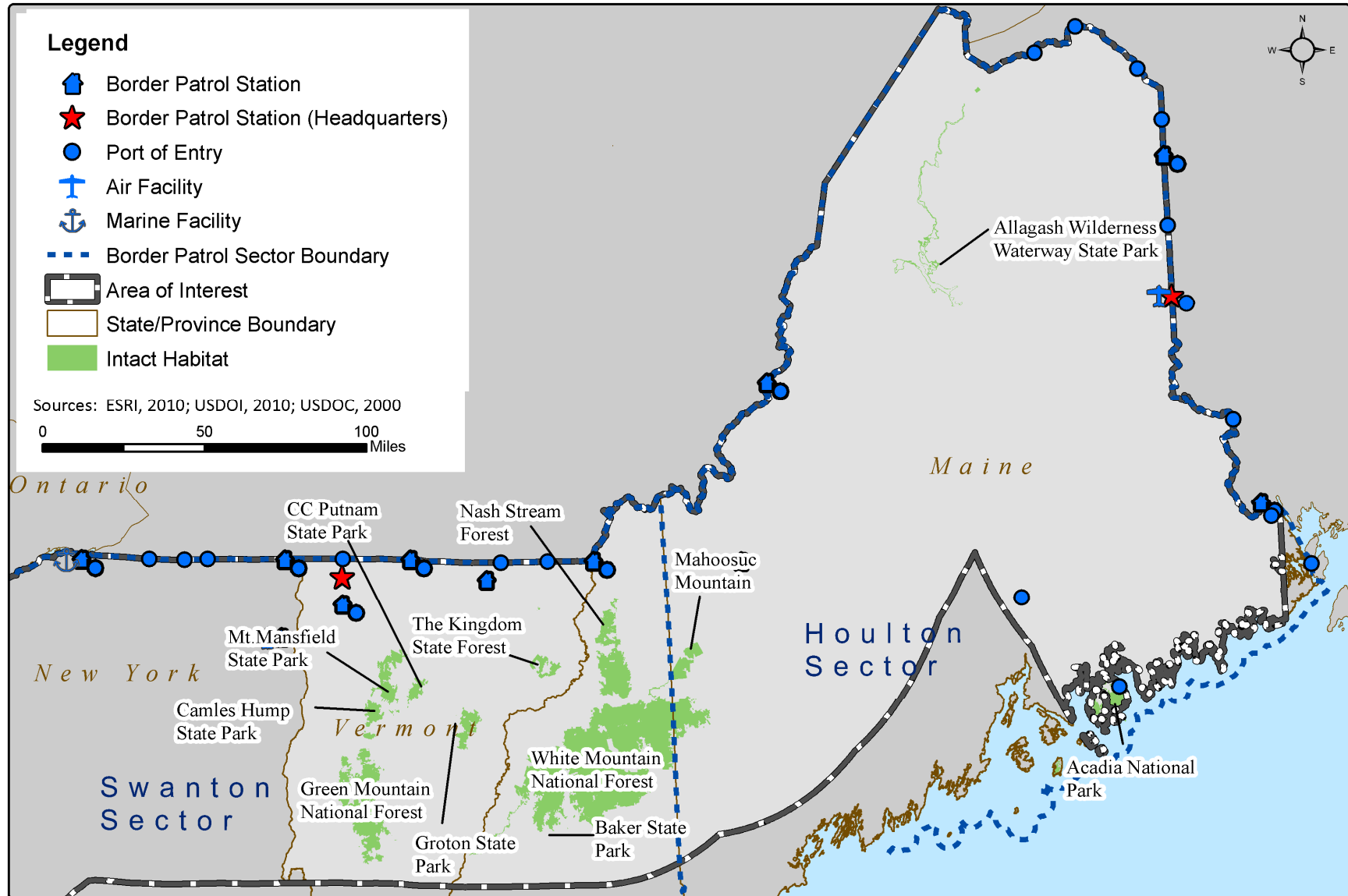
7.3.2.1 Blocks of Regionally Significant Habitat

The blocks of regionally significant habitat listed below and shown in Figure 7.3-2 are relatively undeveloped and intact habitat protected as wilderness, state parks, and state and national forests. Intact habitat refers to areas of largely unfragmented habitat with few alterations or disturbances, such as improved roads or other development. Most areas listed are protected by law (wilderness areas, national parks), while others may occupy private lands and often cross state and country boundaries.

Selected regionally significant blocks of intact habitat that represent this region include:

- Acadia National Park (Maine);
- Allagash Wilderness Waterway State Park (Maine);
- Baxter State Park (Maine);
- Big Reed Pond Forest Preserve (Maine);
- Camels Hump State Park (Vermont);
- C.C. Putnam State Forest (Vermont);
- Great Wass Island Preserve (Maine);
- Green Mountains (Vermont);
- Groton State Forest (Vermont);
- Mahoosuc Mountains – northern extension of the White Mountains (Maine);
- Missisquoi National Wildlife Refuge (Vermont);
- Mt. Mansfield State Forest (Vermont);
- Nash Stream Forest (New Hampshire);
- Roosevelt Campobello International Park (New Brunswick, Canada);
- Silvio O. Conte National Fish and Wildlife Refuge (Massachusetts);
- Spednic Lake (New Brunswick, Canada);
- The Kingdom State Forest (Vermont); and,
- White Mountain National Forest (New Hampshire).

Figure 7.3-2. Blocks of Regionally Significant Habitat in the New England Regions



7.3.2.2 Sensitive Habitats

Within a 100-mile zone adjacent to the U.S.-Canadian border in this region are several ecological communities representing sensitive habitats. The sensitive habitats described here occur in many of the larger habitat areas listed in Section 7.3.2.1, and are home to many of the threatened and endangered species in the next section. For example, the White Mountain fritillary (butterfly) (*Boloria titania montinus*), a subspecies of the purple fritillary (*B. titania*), is endemic to the alpine zone of the Presidential Range of New Hampshire (McFarland 2003). Some descriptive habitats below, such as flowages, span many regional boundaries and are more general in meaning. Others, such as northeastern interior pine barrens (dry forest communities dominated by pines), define much more specific ecological associations.

Many of these habitats are very fine in scale and form a patchwork of biologically sensitive and diverse areas. The list of sensitive habitats is based on those enumerated and described by the World Wildlife Fund (WWF, 2001), ecological system descriptions within the NatureServe.org database, and each state's respective natural resources agency (NatureServe, 2010).

- Alpine meadow—open areas on Adirondack Mountains, generally above 3,500 feet, where cold temperatures and high winds favor a community of ground-layer plants that can tolerate such conditions;
- Acadian-Appalachian alpine tundra—tundra vegetation above the timberline;
- Acadian-Appalachian montane spruce-fir forest—woods of spruce and fir on mountain slopes;
- Bogs—wetland that accumulates acidic peat with deposits of dead plant material;
- Boreal forests—predominately coniferous forest of the Northern Hemisphere;
- Calcareous fens—rarest wetland community with alkaline mineral-rich groundwater;
- Cedar/tamarack swamps—forested wetland characterized by one or both of these tree species;
- Cold-air talus woodland—areas with large, ice-cooled boulders where the microclimate supports black and red spruce, heaths, and evergreen shrubs;
- Flowages—series of connected lakes;
- Freshwater estuaries—ecological community where lake and river waters mix;
- Hardwood swamps—deciduous forested wetland;
- Inland lake shorelines—beaches of inland lakes characterized by water-level fluctuations preventing development of stable shoreline plant communities, instead supporting a more-specialized biota adapted to sandy or gravelly shorelines;
- Limestone bluff cedar-pine forests—forests of these species on limestone bedrock;
- Montane spruce-fir forest—spruce-fir forest on mountain slopes;
- Montane yellow birch-red spruce forest—birch-fir forests on mountain slopes;
- Northeastern interior pine barrens—dry pine forest on sandy, acidic, nutrient-poor soils;

- Pitch pine-oak-heath rocky summit—lower-elevation transition zone with pitch pine, oak, and associated shrub zone;
- Riverine marsh—riverside, deep-marsh wetland;
- Sedge meadow—wetland dominated by sedges growing on saturated soils typically composed of peat or muck; and,
- Subalpine krummholz—stunted wind-shaped coniferous forest below the timberline.

7.3.2.3 Threatened and Endangered Species

Federally listed threatened and endangered species are protected by the Endangered Species Act (ESA) of 1973. The purpose of the ESA is to protect and recover imperiled species and the ecosystems upon which they depend.

Appendix M lists the threatened or endangered species by county in the New England Region. Species are listed as threatened or endangered at either the Federal and/or state level. There is no designated critical habitat for threatened or endangered species in the region.

Some states differ in how they list and protect threatened and endangered species. The following list gives the specific agencies and listing differences (if applicable) in the New England Region.

- Vermont has an endangered species law that covers both animals and plants. The law does not require the development of recovery plans, although the state is preparing plans for some state-listed species. (NANFA, 2011).
- New Hampshire's Endangered Species Conservation Act protects non-domesticated species of wildlife indigenous to the state (NANFA, 2011).
- Maine passed an endangered species act (NANFA, 2011) in 1975.

Following are examples of some of the threatened and endangered species in the New England Region:

The Atlantic salmon (*Salmo salar*), is a federally listed endangered species with a range from the Androscoggin River northward along the Maine coast to the Dennys River. Impassable falls in the rivers limit the upstream extent of its freshwater range. The Atlantic salmon is an anadromous fish, typically spending two to three years in fresh water, migrating to the ocean where it spends an additional two to three years, and then returning to its natal river for spawning. Atlantic salmon in the Gulf of Maine represent the last wild populations of this fish in the United States. When listed under the ESA in 2000, at least eight rivers in the geographic range of the distinct population segment still supported wild Atlantic salmon populations (Fay et al. 2006).

Atlantic salmon



Source: (NDL, No Date).

The piping plover (*Charadrius melodus*) is a federally listed threatened species that occupies beaches, mudflats, sandflats, tidal ponds, and salt marshes in Maine. The roseate turn (*Sterna dougallii*) is a federally listed endangered species that occupies Salt marsh islands and beaches with sparse vegetation in Maine.

Least tern



Source: (NDL, No Date).

The Canada lynx (*Lynx canadensis*) is a federally threatened species listed in New Hampshire, Vermont, and Maine. This species occupies boreal/hardwood forests, preferring areas of higher altitude that receive deep snows and have high-density populations of snowshoe hares (*Lepus americanus*). Timber harvest, recreation, and other related activities are the predominant land uses affecting lynx habitat.

Additional federally listed endangered species in New England also include the roseate tern (*Sterna dougallii*) in Maine, the Karner blue butterfly (*Lycaeides melissa samuelis*) in New Hampshire, and the Indiana bat (*Myotis sodalis*) in Vermont.

Plant species include Furbish's lousewort (*Pedicularis furbishiae*) along the U.S-Canada border, the eastern prairie fringed orchid (*Plantanthera leucophaea*), which has populations in 6 states, including 1 population in Maine and the small whorled poponia (*Isotrea medeoloides*), which is widely but sparsely distributed in 17 eastern states, including Maine and New Hampshire, and Canada.

7.3.2.4 Wildlife Typically Found in the Region

Many birds, especially songbird species, such as the magnolia warbler (*Dendroica magnolia*) and the white-throated sparrow (*Zonotrichia albicollis*), migrate through this part of the northern border region twice each year. Many other bird, mammal, reptile, and amphibian species remain in the New England ecoregions year-round. Other common avian species include the broad-winged hawk (*Buteo platypterus*), ruffed grouse (*Bonasa umbellus*), hermit thrush (*Catharus guttatus*), and blue jay (*Cyanocitta cristata*). In boreal forest and coniferous forest habitats in the northernmost portion of the region, many passerine species typical of these forested habitats occur, including more than 25 warbler species (family Parulidae), rose-breasted grosbeak (*Pheucticus ludovicianus*), and coniferous forest birds, such as black-backed woodpecker (*Picoides arcticus*) and gray jay (*Perisoreus canadensis*).

The woodlands of this region are home many common animal species, including mammals such as the black bear (*Ursus americanus*), mule deer (*Odocoileus hemionus*), moose (*Alces alces*), fisher (*Martes pennant*), bobcat (*Lynx rufus*), fox (*Urocyon* spp. or *Vulpes* spp.), shrews (*Sorex* spp.), red squirrel (*Sciurus vulgaris*), and skunk (*Mephitis* spp.). Amphibians include red-backed salamander (*Plethodon cinereus*), spotted salamander (*Ambystoma maculatum*), red-spotted newt (*Notophthalmus viridescens*), and American toad (*Bufo americanus*). Common garter snakes (*Thamnophis* spp.) and wood turtles (*Glyptemys* spp.) are also adapted to this northern climate.

Red-backed Salamander, *Plethodon cinereus*



Source: (NDL, No Date).

Marine mammals common within the region's coastal areas include seals (harbor seal, *Phoca vitulina*; gray seal, *Halichoerus grypus*; harp seal, *Phoca groenlandica*), and whales (humpback whale, *Megaptera novaeangliae*, fin whale, *Balaenoptera physalus*). All marine mammals are protected under the Marine Mammal Protection Act (MMPA) of 1972. This act prohibits, with certain exceptions, the take of marine mammals in U.S. waters. The Department of Interior (DOI) oversees protection of the sea otter, walrus, polar bear, dugong, and manatee; and the Department of Commerce (DOC) oversees the protection of pinnipeds (other than walrus) and cetaceans (whales) (Bailey, 1995; EOE, 2009; VTDFG, 2011; NHFGD, 2011; MEDIFW, 2011).

7.3.2.5 Vegetative Habitat Typically Found in the New England Region

Forested habitats dominate the vegetative cover within the region. The Laurentian Ecoregion is primarily composed of coniferous and mixed forest with several species of conifers, particularly white pine (*Pinus strobus*), eastern hemlock (*Tsuga canadensis*), black spruce (*Picea mariana*) and white spruce (*Picea glauca*), balsam fir (*Abies balsamea*), and tamarack (*Larix laricina*). Deciduous species become increasingly common in the mixed forest. The species assemblages within the mixed forests are highly dependent on the soils; deciduous species typically favor nutrient-rich soils, while conifers thrive in poor ones. Pines are common in areas altered by fire. Shrub and herbaceous layers add to the vegetative diversity within each of these forests (Bailey, 1995; EOE, 2009).

The Adirondack-New England Mixed Forest Coniferous Forest-Alpine Meadow ecoregion is a mountainous region that transitions between true spruce-fir forest in the north to deciduous forest in the south. The growth form and species of this forested ecoregion are similar to those ecoregions further north, but red spruce (*Picea rubens*) grows here instead of white spruce (*Picea glauca*). Vegetational zonation is present, with both elevation and latitudinal aspects. Mountain slopes at lower elevations are usually covered with mixed forest, typically of spruce, fir, maple (*Acer* spp.), and birch (*Betula* spp.). The effect of latitude is noticeable from north to south.

Vegetative cover within the Eastern Broadleaf Forest (Oceanic) ecoregion includes forested and wetland habitats. Typical vegetative cover includes oak-hickory and maple-beech forests. Wetter forests often have a well-developed understory made up of flowering dogwood (*Cornus florida*), sassafras (*Sassafras albidum*), and hop hornbeam (*Ostrya virginiana*), along with evergreens and wildflowers (Bailey, 1995; EOE, 2009; VTDFG, 2011; NHFGD, 2011; eFloras, 2011).

7.3.2.6 Wetlands and Waterways

Wetland types within this region include:

- Beaches;
- Floodplain forests;
- Hardwood and coniferous swamps;
- Intertidal flats;
- Lacustrine wetlands (lakes);
- Marine and estuarine deepwater habitats;
- Marine and estuarine marshes;
- Palustrine emergent wetlands (marshes, fens, wet meadows, sedge meadows, wet prairies);
- Palustrine forested/scrub shrub wetlands;
- Palustrine open water (ponds);
- Riverine habitat (rivers and streams); and,

- Shallow/open-water communities.

Wetlands are those portions of the landscape where water saturation influences soil development, plant communities, and wildlife habitat. The U.S. Fish and Wildlife Service (USFWS) definition of wetlands encompasses areas that are periodically inundated or saturated with groundwater or surface water, and function as transition areas between uplands and aquatic habitats. Deepwater habitats, as defined by the USFWS (Cowardin et al., 1979), are permanently flooded lands below the wetland boundary in ponds, lakes, or oceans. Wetlands can be very sensitive to disturbance and have a greater likelihood of slow recovery compared to adjacent uplands. (Sheldon et al., 2003).

The marine and estuarine systems within the Laurentian Mixed Forest Province occur along the southeast coast of Maine, a portion of which sits in the northern border area. Notable wetlands include the Hurlbert (Atlantic white cedar) Swamp in New Hampshire (TNC, 2010) and the LaPlatte River Marsh and Gillette Swamp in Vermont.

7.3.2.7 Aquatic Resources in the Region

Aquatic resources are highly regarded in the New England Region, luring outdoor enthusiasts to the region for hunting and fishing. Abundant lakes, rivers, ponds, wetlands—the remnants of glacial recession—form dominant features on the landscape. The Atlantic Ocean borders portions of this region.

The aquatic resources within the region support a diverse fishery. Notable fish species include the lake sturgeon (*Acipenser fulvescens*), walleye (*Sander vitreus*), northern pike (*Esox lucius*), muskellunge (*E. masquinongy*), Atlantic salmon (*Salmo salar*), smallmouth bass (*Micropterus dolomieu*), largemouth bass (*M. salmoides*), brook trout (*Salvelinus fontinalis*), lake trout (*S. namaycush*), yellow perch (*Perca flavescens*), white sucker (*Catostomus commersonii*), sculpin (order – Scorpaeniformes), common shiner (*Luxilus cornutus*), and creek chub (*Semotilus atromaculatus*). Various native reptiles, amphibians, waterbirds, aquatic insects, mussels, and crustaceans also thrive in the region's waters (USDOC, 2010a). All native fish species in this region may be affected by water quality degradation due to human activity and also from the introduction of invasive species.

The Appalachian Plateau of the Eastern Broadleaf Forest (Oceanic) ecoregion has important aquatic resources as well, ranging from small natural lakes to wetlands. Major rivers in the New England Region include: the Androscoggin, Pemigewasset, Saco, Merrimack and Ammonoosuc rivers in New Hampshire, the Connecticut River between New Hampshire and Vermont, and the Missisquoi and Passumpsic rivers in Vermont. Important lakes include: Moosehead and Sebago in Maine, the Connecticut Lakes, Lake Winnepesaukee, Ossipee Lake, Sunapee Lake, Newfound Lake, and Lake Umbagog in New Hampshire; and lakes Champlain and Memphremagog in Vermont.

Aquatic resources are also highly regarded within the Eastern Broadleaf forest ecoregion, providing hunting and fishing for outdoor enthusiasts. The aquatic resources in this province are highly regarded due to the richly diverse fish populations. Large lakes, rivers, and streams constitute important habitat for freshwater fish in this ecoregion (Bailey, 1995; EOE, 2009).

7.4 GEOLOGY AND SOILS

7.4.1 INTRODUCTION

The geology, topography, and soils in the New England Region in the northern border study area vary widely throughout the region. Geology can be described as the study of the earth's history through rock formations. These rocks often serve as the parent rock for soils present at and below the surface. The topography of a given area on earth can be described as its surface, shape, or features

This section addresses the geologic conditions in the New England Region and describes the potential impacts of CBP's program alternatives on geologic resources. The study area contains significantly different topographic features ranging from glaciated lowlands to high relief in the Appalachian Highlands to the Atlantic seaboard. Geologic formations include crystalline mountain uplifts, magma intrusions, and depressed glacial lowlands.

7.4.2 AFFECTED ENVIRONMENT

7.4.2.1 Physiographic Provinces

Just one physiographic division covers the New England Region; this division is subdivided into provinces as well as some sections (Figure 7.4-1 and Table 7.4-1).

The Highlands encompass three provinces; these are further divided into sections. The St. Lawrence Province contains the Champlain section and the Valley and Ridge Province includes the Hudson Valley. The New England Province is divided into four sections: Taconic, Green Mountain, New England Upland, and White Mountains. Table 7.4-1 provides details on the geology of these areas and Appendix N features a geologic time scale showing the ages of the geologic time periods with which rock formations are dated.

Figure 7.4-1. Physiographic Provinces, Division, and Sections of the New England Region

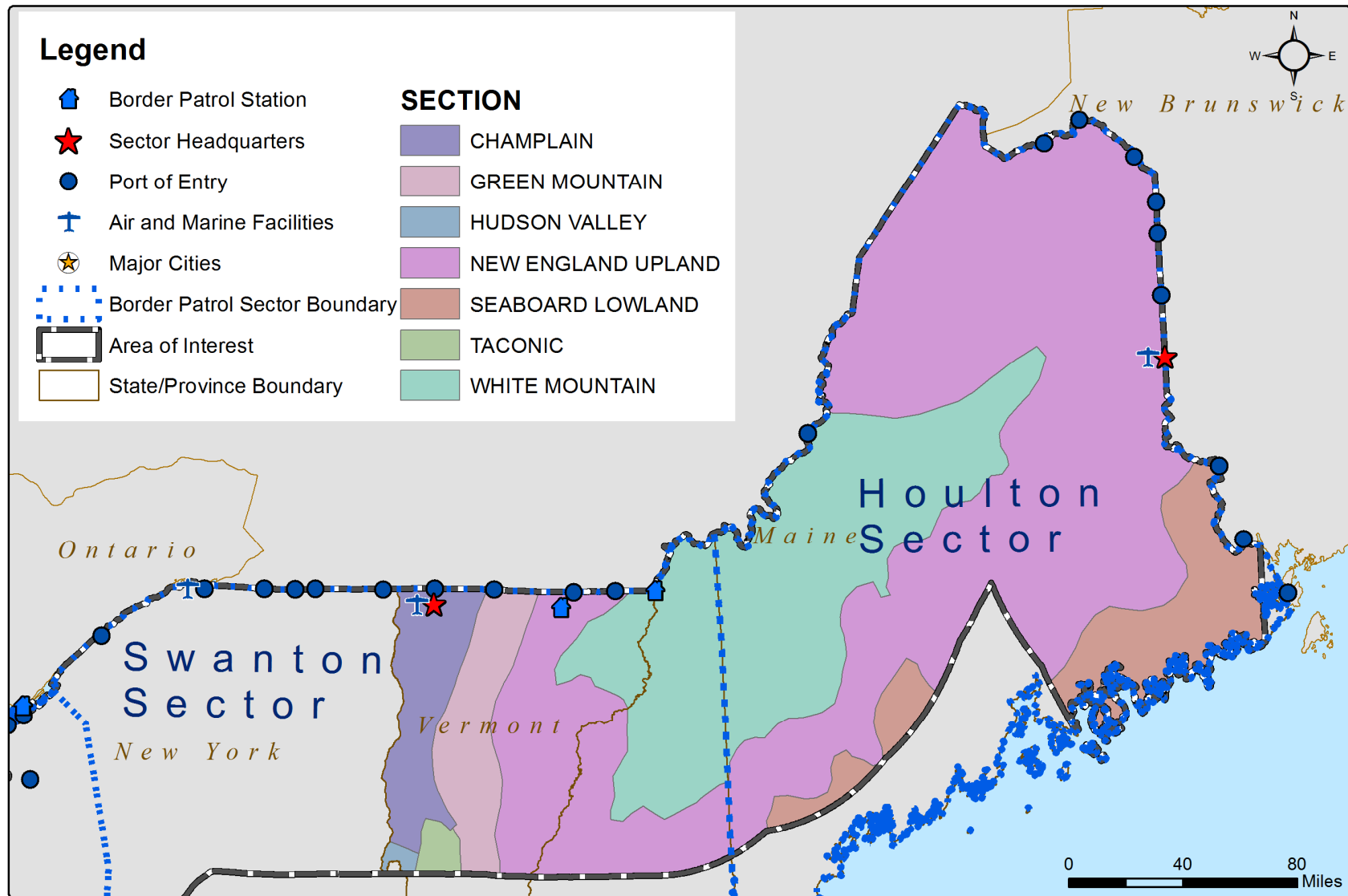


Table 7.4-1. Physiographic Provinces in the New England Region.

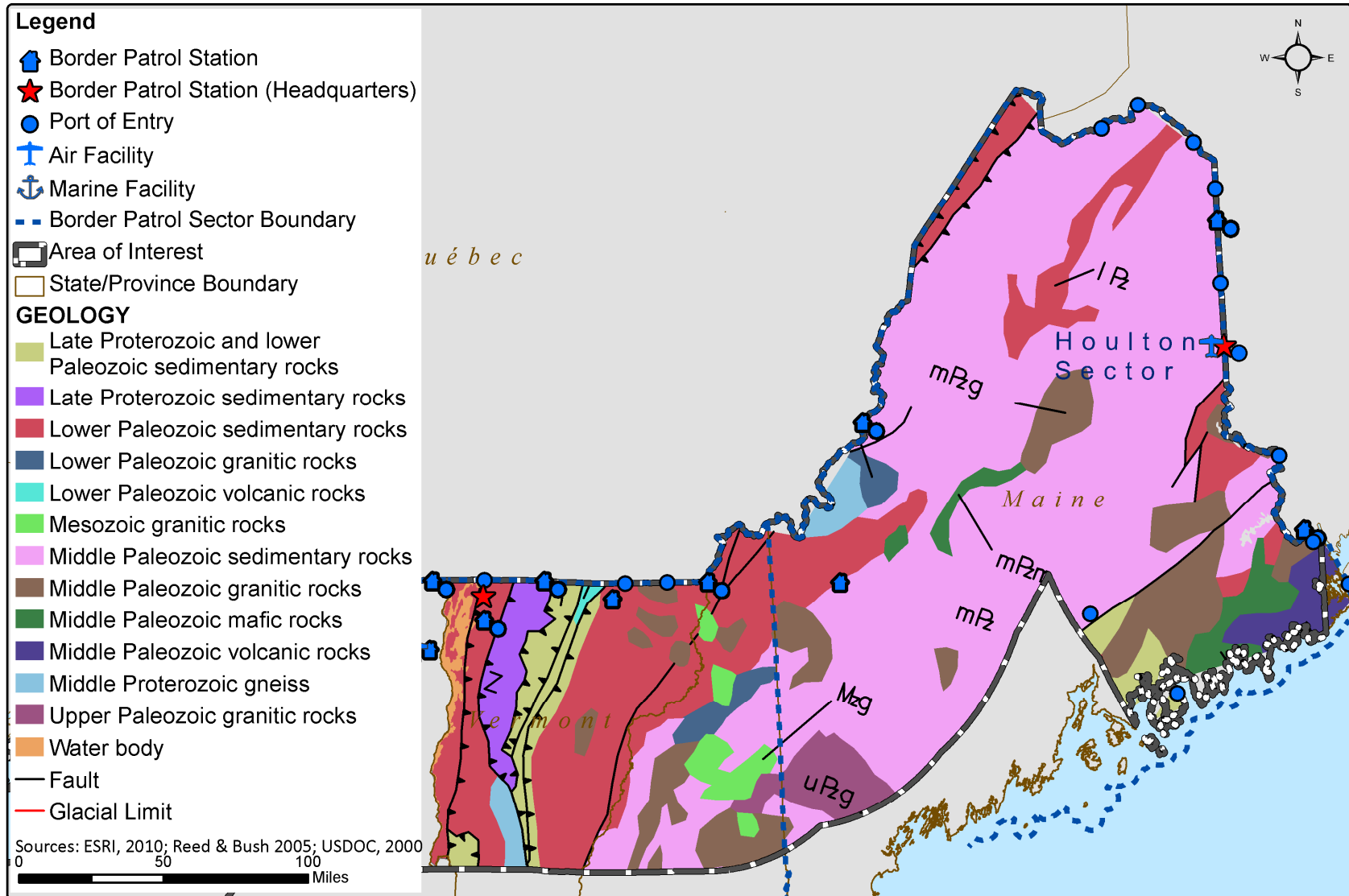
Division	Province	Section	Terrain Texture including Topography	Geologic Structure and History	Generalized Rock Types
Appalachian Highlands	St. Lawrence Valley	Champlain	Rolling lowland, glaciated; in part covered by young marine plain (Fenneman, 1928).	An area of high relief; glaciated with each North American glacial progression; greater relief than the average for the province (Fenneman, 1928).	Boundary marked by the contact of Paleozoic and Precambrian rocks. Large part of eastern boundary is at the foot of the Green Mts. This line agrees in the main, but not accurately, with contact of Paleozoic and Precambrian rocks (Fenneman, 1928).
Appalachian Highlands	Valley and Ridge	Huon Valley	Long ridges and valleys, some areas of high relief.	Formed during Appalachian Mts. development; rivers eroded the valleys.	Mostly sedimentary rock, uplifted through mountain-building.
Appalachian Highlands	New England	Taconic	200-mile-long mountain range surrounded by rolling hills to the west and river valleys to the east.	Formed in the late Ordovician.	Various sedimentary and metamorphic formations.
Appalachian Highlands	New England	Green Mountain	Linear ranges of subdued and glaciated mountains and residual plateaus (Fenneman, 1928).	Linear mountain ranges with granite axis. May have been eroded by rivers (Fenneman, 1928).	Precambrian granite; other rocks included (Fenneman, 1928).
Appalachian Highlands	New England	New England Upland	Non-mountainous; generally more than 500 feet high; characterized by sharp valleys. Ranges from 1,100 feet or more for mountains farthest from the sea to less than 600 feet at the boundary of the seaboard lowland (Fenneman, 1928).	Water-eroded plains, sharp and narrow valleys, giving surface a plateau aspect. Strong evidence of glaciation (Fenneman, 1928).	Various sedimentary, metamorphic, and igneous formations.

Division	Province	Section	Terrain Texture including Topography	Geologic Structure and History	Generalized Rock Types
Appalachian Highlands	New England	White Mountains	Extensive mountain range in NH reaching maximum height of 6,288 ft. on Mt. Washington.	Formed by magma intrusions about 100 million years ago over the ancient New England hotspot.	Glaciated mountain masses of crystalline rocks with abundant erosion-resistant outcroppings (Fenneman, 1928).
Appalachian Highlands	New England	Seaboard Lowland	Ranges from sea level to a maximum elevation of around 700 ft.	Depressed coastal lowland due to glaciation.	Pennsylvanian sedimentary rocks.

7.4.2.2 Geologic Conditions

The geologic conditions within the New England Region are complex, resulting from tectonic and related activities (e.g., faulting, volcanic activities, and seismic sea waves) and glacial activities along with erosive actions of wind and water. The New England Region contains consolidated geologic formations consisting of sedimentary, igneous, and metamorphic rocks. The New England Region also contains unconsolidated geologic formations consisting of alluvium, terrace deposits, glacial deposits, and other mixtures of sands, silts, and clays with various mixtures of rocks. The geologic formations are shown on Figure 7.4-2.

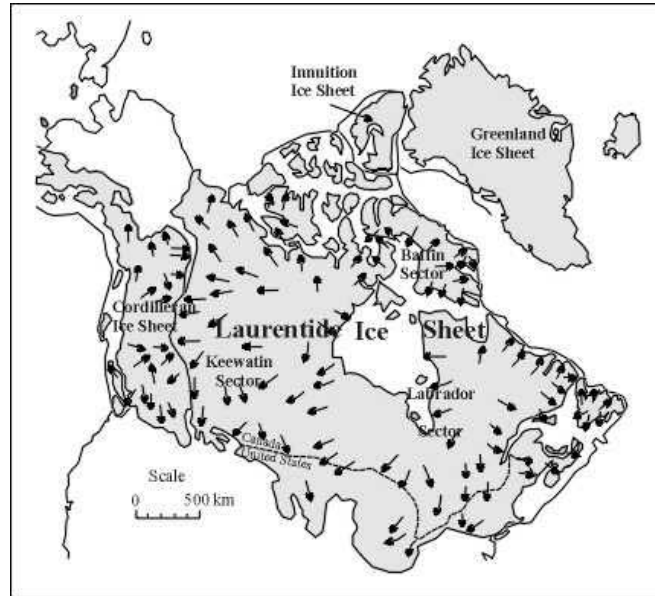
Figure 7.4-2. Geologic Conditions of the New England Region



Regional Glaciation

During the Wisconsin glaciation, which ended around 10,000 years ago, the Laurentide Ice Sheet covered all of the New England Region. In addition to the ice sheet, mountain glaciers also expanded in high elevations.

Figure 7.4-3. Extent of the Laurentide Ice Sheet



The effects of glacial advances are readily apparent in the northern United States. Polished and striated outcroppings, rounded hills, moraines, valley fills of glacial till and outwash, and other typical glacial features are evidence of Pleistocene glaciation. All along the northern border, till deposits, erratics, and moraines are common (Nelson, 2003). Till, a sedimentary deposit derived from glacial erosion, was deposited throughout the northern United States as the ice sheets receded.

Seismicity and Tectonics

Seismic activity in the New England Region is rare (Figure 7.4-4). Seismic hazards are described in terms of minimum peak horizontal ground acceleration values. USGS describes this value as the fastest speed of horizontal particle movement at ground level due to an earthquake.

Landslides

In New England, most landslides occur due to rainfall, snowmelt, and human activities occurring on the steep mountain slopes (Figure 7.4-5).

Karst Topography

In the New England Region, karst landscapes are found in small areas (Figure 7.4-6) scattered through Vermont and northeastern Maine. These areas have mostly short (less than 1,000 ft. long) features in various types of carbonate rock.

Figure 7.4-4. Seismicity in the New England Region

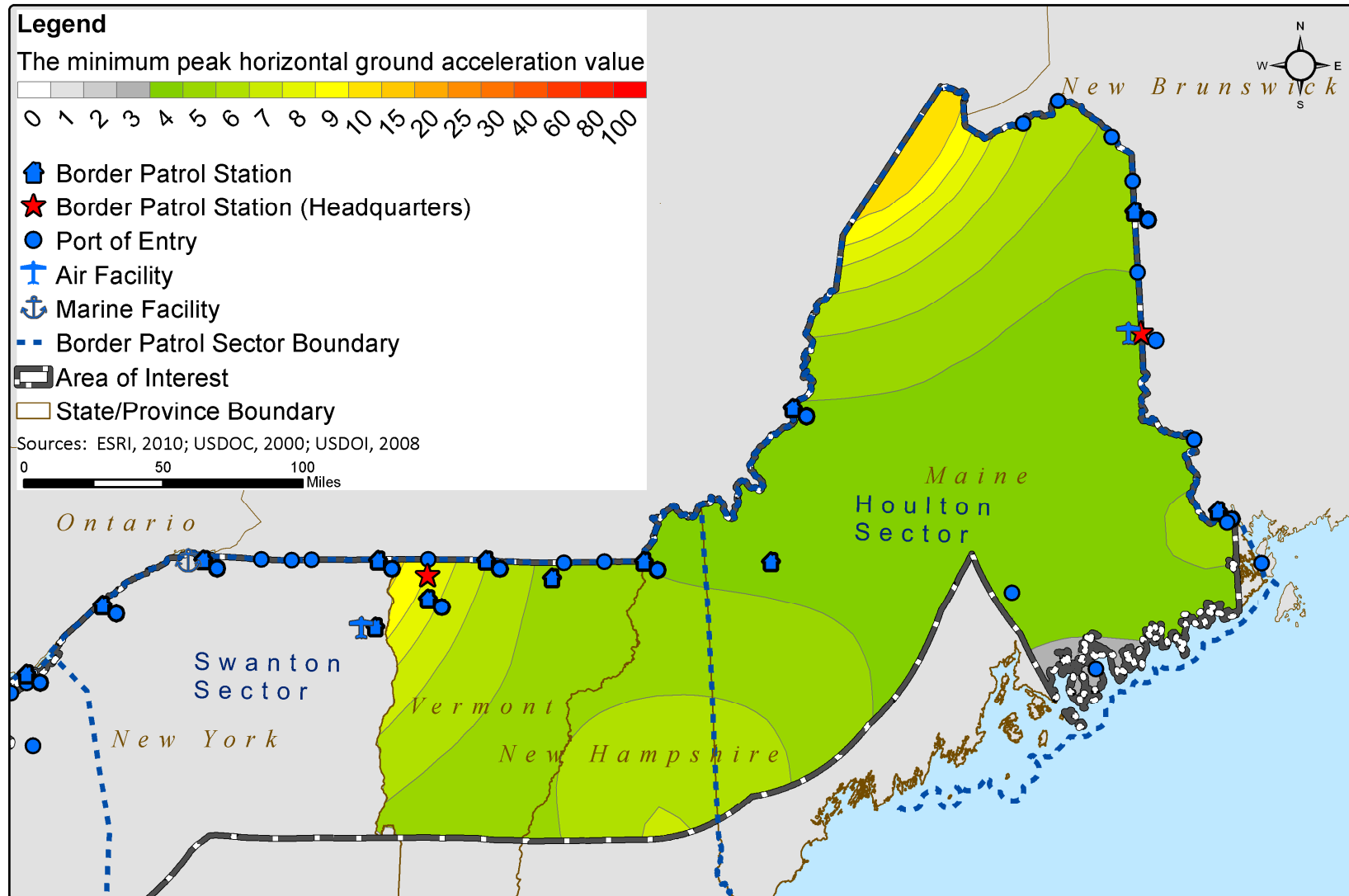


Figure 7.4-5. Landslide Incidence in the New England Region

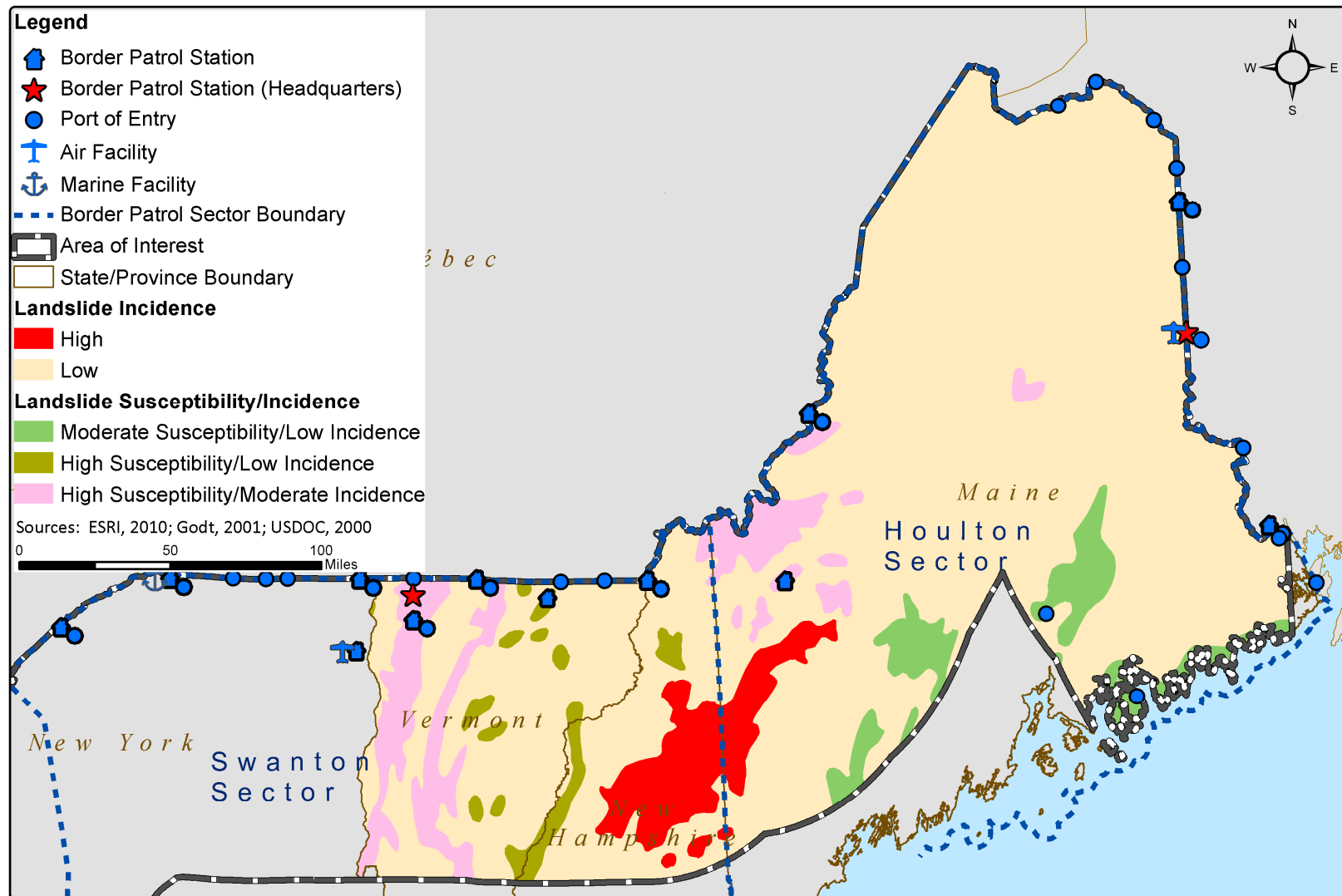
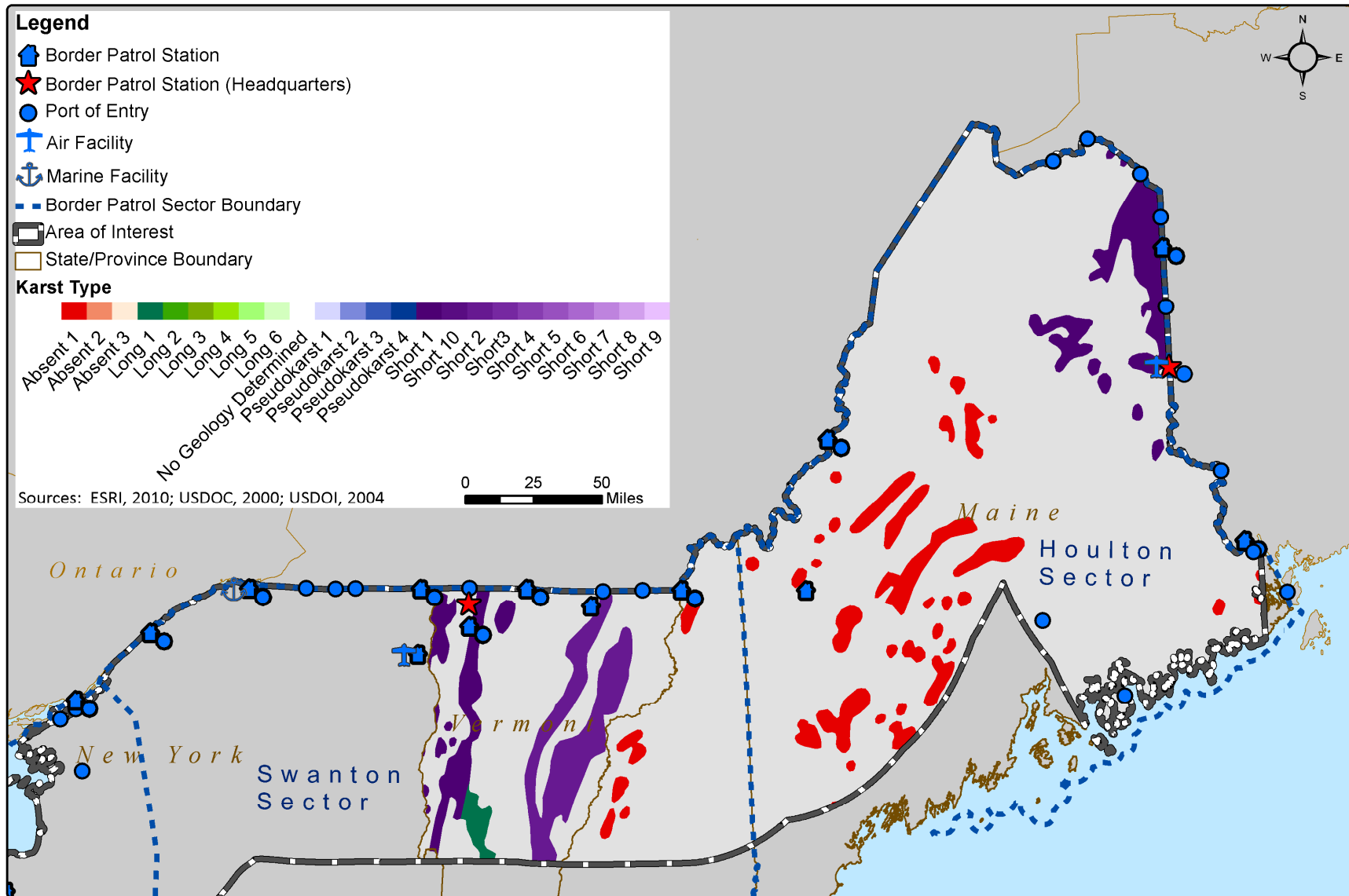


Figure 7.4-6. Karst Topography in the New England Region



7.4.2.3 Soils

In the New England Region, soils contain a range of particle sizes but are mainly sandy to loamy, sometimes with clay (Figure 7.4-7). Spodosols, one of the most dominant soil types, span Vermont and Maine and do not have a high erosion potential. They also are fairly acidic, and as a result are not productive without management (University of Idaho, No Date).

Inceptisols are the second most common soil type in the region. This soil order occurs in Vermont and Maine and has a high erosion potential. Since inceptisols develop on surfaces that have not had adequate time to develop soil profiles, they do not have extensive soil horizons. Both the lack of horizon development and location on steep slopes contribute to the high erosion potential of inceptisols (University of Idaho, No Date). Alfisols also cover portions of the region, mainly along the Vermont/New York border. Since alfisols are primarily clay, their erosion potential is low (University of Wisconsin, 1999).

Histosols and entisols are the least prevalent soil orders in the New England Region. The histosols in the region are mainly found in areas of poor drainage. This water accumulation decomposes organic materials and creates peaty and mucky conditions. Histosols have a low weight-bearing capacity and, if they are drained of water, land subsidence may occur (University of Idaho, No Date). Entisols are soils that do not fit into any of the other 12 soil orders. These are young soils and have only an A horizon. Entisols are the most extensive soils in the world, and can be very diverse based on the parent material from which they develop (University of Idaho, No Date). This soil order is often the transition layer between soils and non-soil parent rock.

7.4.2.4 Prime and Unique Farmland

In the New England Region, Prime and Unique Farmland has a maximum of six percent of land cover (Figure 7.4-8). Compared to other regions in the United States, the New England Region has a low percentage of designated Prime and Unique Farmland.

Figure 7.4-7. Soil Orders in the New England Region

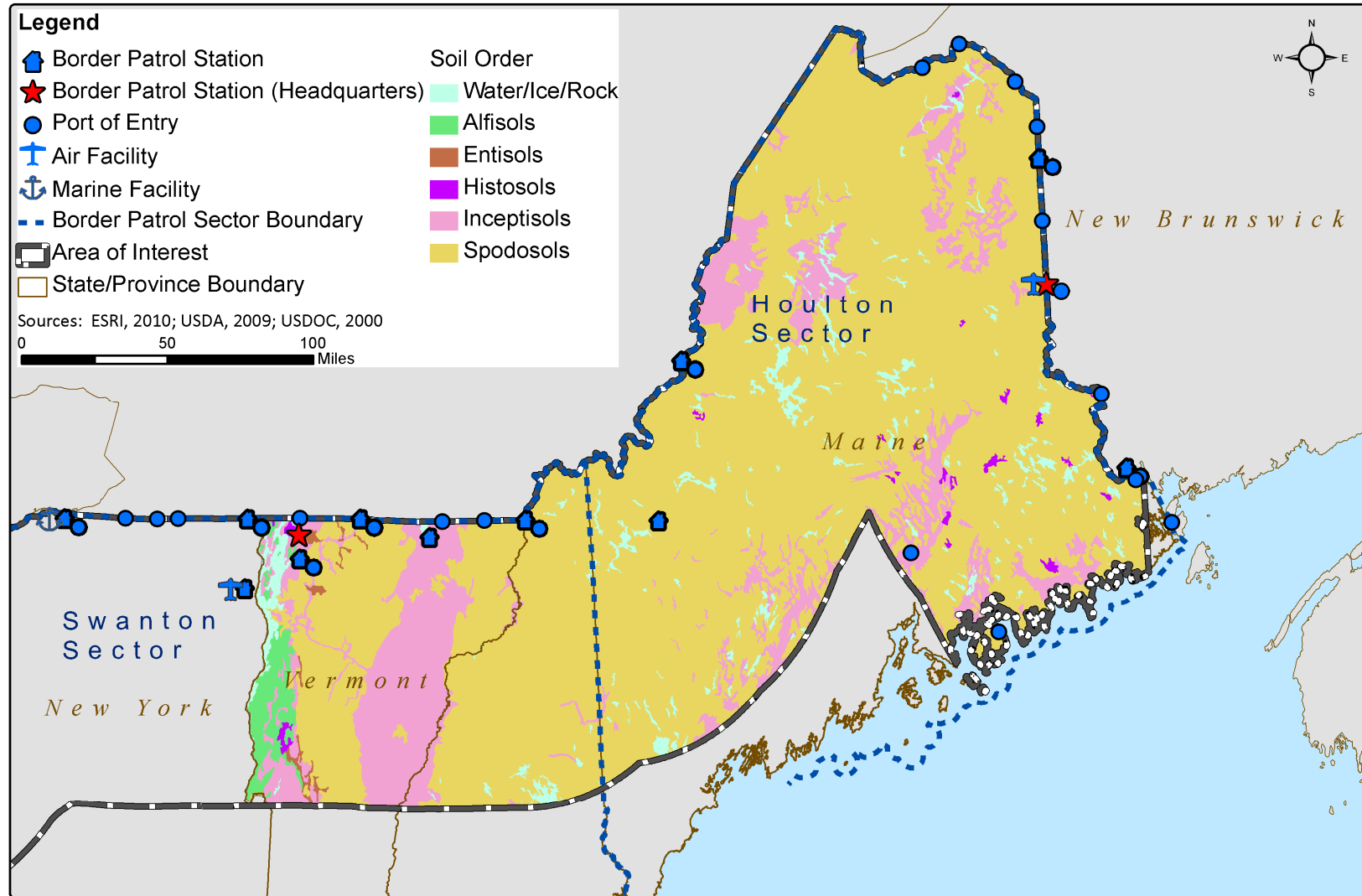
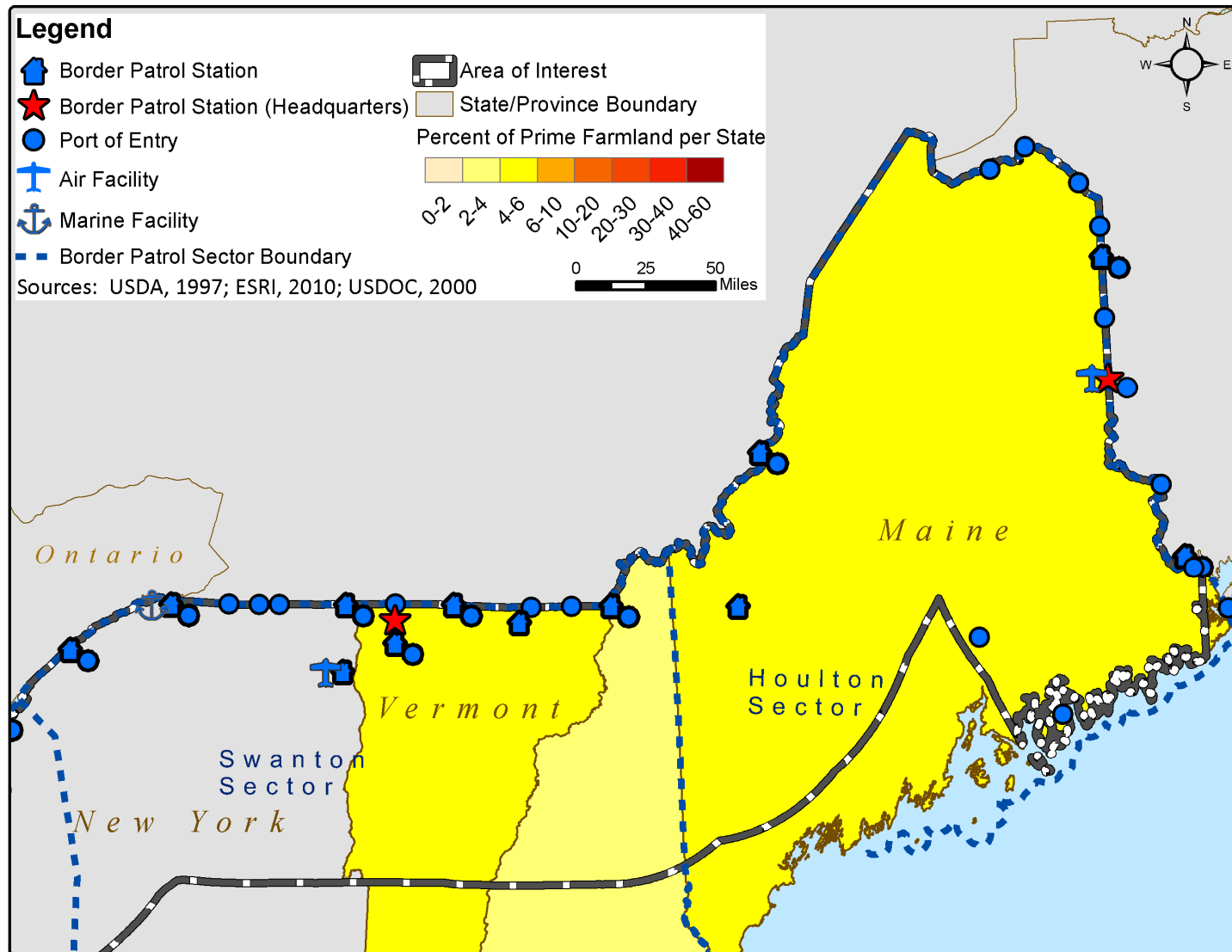


Figure 7.4-8. Prime Farmland in the New England Region



7.5 WATER RESOURCES

7.5.1 INTRODUCTION

Water resources are distributed widely throughout the 100-mile PEIS study corridor in the states of Vermont, New Hampshire, and Maine. For the purposes of this study, this resource area consists of hydrologic and groundwater resources (aquifers, subterranean watercourses, and recharge areas), surface water and waters of the United States (lakes, ponds, rivers, streams, and channels), and floodplains. Water resources include several beneficial elements, such as water supply quantity and quality, habitat for aquatic organisms, recreation, and flood storage capacity, which are subject to effects from proposed activities.

7.5.2 AFFECTED ENVIRONMENT

7.5.2.1 Groundwater

Groundwater resources are sources of water that result from precipitation infiltrating the ground surface. Groundwater is contained in either confined or unconfined aquifers. When the water table or piezometric surface reaches the ground surface, groundwater will reappear as either streams, surface bodies of water, or wetlands. This exchange between surface water and groundwater is an important feature of the hydrologic cycle.

Groundwater has a variety of beneficial uses. In the New England Region, as in the rest of the country, groundwater is a primary source for a wide variety of water uses including irrigation, domestic water supply, fish propagation, commercial water supply, industrial uses, and livestock. Table 7.5-1 shows the categories of groundwater use for states within the New England Region.

Table 7.5-1. Water Use in the New England Region in 2005

State	Irrigation Use (%)	Public Water Supply (%)	Industrial Use (%)	Rural Domestic, Livestock (%)
Vermont	0.6	8.9	82.8	7.7
New Hampshire	1.0	22.7	62.5	13.8
Maine	0.8	20.6	59.3	19.3

Source: (Kenny et al., 2009).

Groundwater occurs in porous rock layers called aquifers, which may be large and regional, such as the Ogallala Aquifer, which underlies many states in the Great Plains. Aquifers may also be very small and localized.

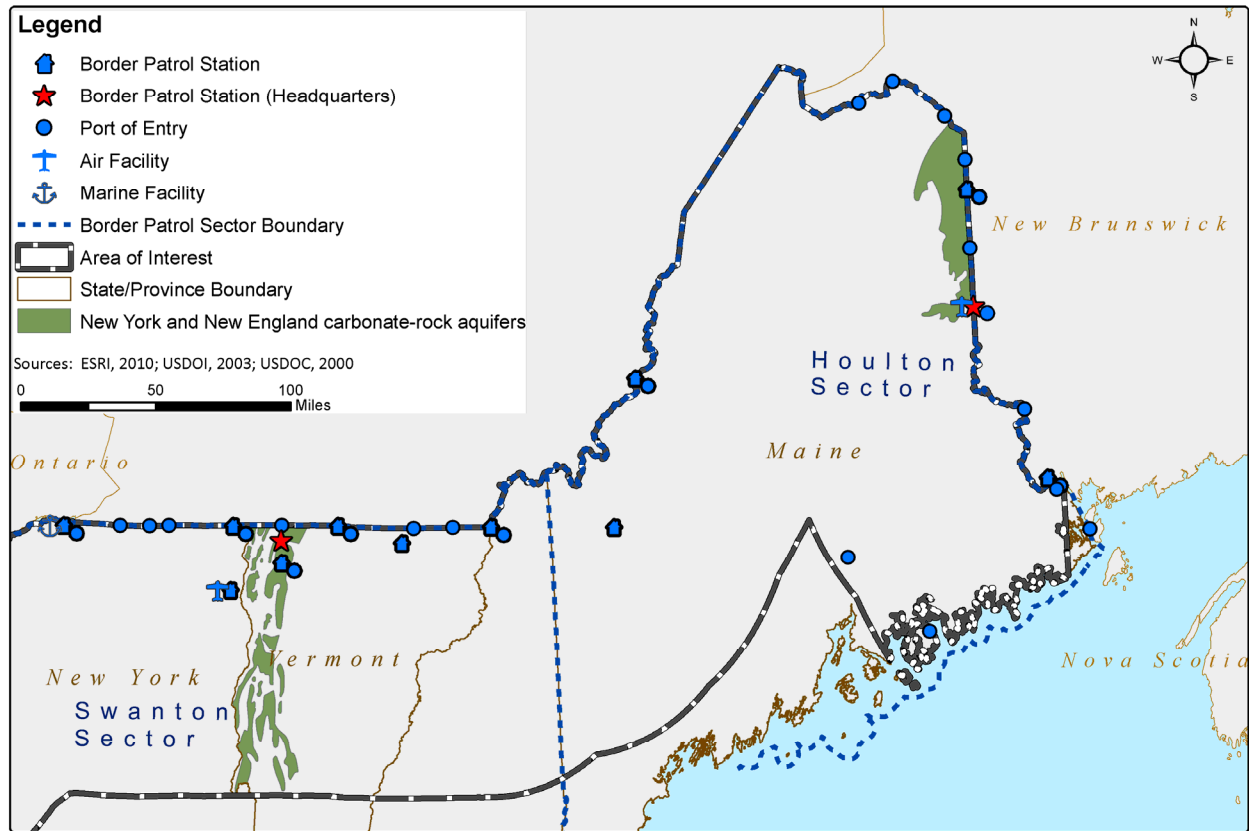
Groundwater in Maine occurs in two primary kinds of aquifers: (1) sand and gravel; and (2) bedrock. Sand and gravel aquifers are unconsolidated sand and gravel deposits, with excellent porosity and permeability that make them significant groundwater resources. They formed as water melted from glaciers, so they are only found in limited areas around the state. The entire state of Maine is underlain with bedrock composed of igneous and metamorphic rock. Almost

everywhere, this bedrock is fractured, which provides the open space through which groundwater flows (MGS, 2005).

Groundwater in New Hampshire is the most important source of drinking water. Approximately 60 percent of New Hampshire residents rely on groundwater for their drinking water. Community water systems serve an estimated 60 percent of the state's households; over a third of this water comes from groundwater. Of the 2,177 public water systems in New Hampshire, 98 percent rely on groundwater. Groundwater is also the source for the 40 percent of New Hampshire residents who rely on private water systems. Groundwater also provides an estimated 40 percent of the total flow in New Hampshire's rivers, which in turn feed the state's lakes, reservoirs, and estuaries. While 85 percent of private water supply wells tap bedrock aquifers, most high-yielding public water supply wells tap stratified-drift aquifers (NHDES, 2003).

Sixty-six percent of Vermont's population depends on groundwater for drinking water. Groundwater also has a key role in manufacturing, agriculture, and commercial operations. Groundwater recharges lakes, streams, and wetlands that in turn protect and support wildlife. Vermont's bedrock geology is tightly folded and broken as a result of the uplift of the Green Mountains. On top of the bedrock are sedimentary deposits—boulders, gravel, sand, and clay—that were laid down as the glaciers retreated. All of these layers define the aquifer that contains Vermont's groundwater (VDEC, 2003).

Figure 7.5-1. New England Region Groundwater Aquifers

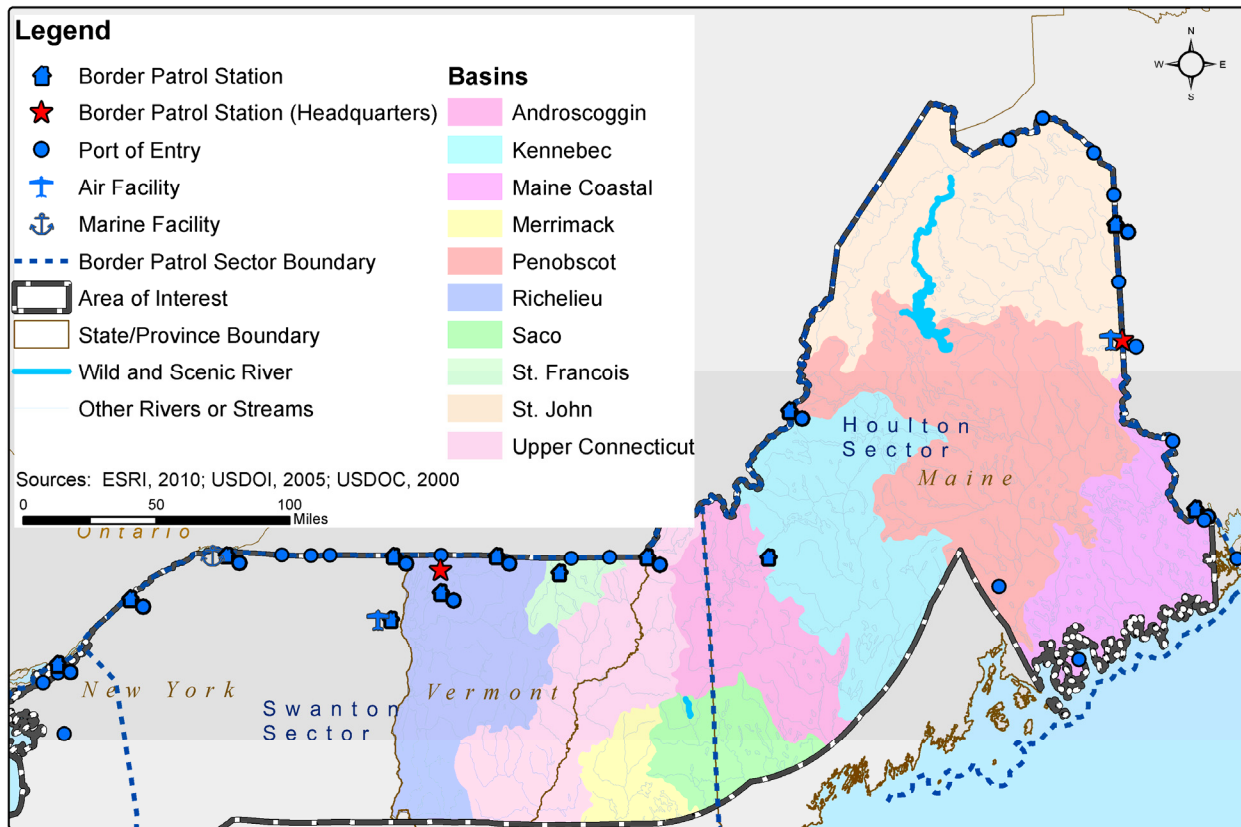


7.5.2.2 Surface Waters and Waters of the United States

Surface water is water found in lakes, rivers, ponds, wetlands, and oceans. It is the most abundant and visible form of water resource, with the greatest variety of uses. In addition to irrigation, domestic water supply, fish propagation, commercial water supply, industrial uses, and livestock, surface water supports recreation, fish and wildlife habitat, hydropower, and transportation. Section 7.3.2.7 provides a discussion of the regional affected environment for aquatic resources. Surface water is often identified by the basin or watershed in which it is found. A watershed is simply the topographic area defined by the drainage of a single body of water.

There are two designated Wild and Scenic Rivers within the 100-mile corridor of the New England Region; Wildcat River in New Hampshire and Allagash River in Maine. Figure 7.5-2 shows these Wild and Scenic Rivers as well as the other river basins found within the 100-mile corridor for the New England Region.

Figure 7.5-2. River Basins in New England Region



The St. John River Basin drains 21,400 square miles in northern Maine and Canada. It forms the U.S.-Canadian border between St. Francis, Maine and Grand Falls, New Brunswick, where the river crosses exclusively into Canadian territory. The river is approximately 420 miles long. The topography within the basin is mostly flat with rolling hills. The basin is largely undeveloped and much of the land is forested. Major communities within the St. John River Basin include Fort Kent, Fort Fairfield, Houlton, Caribou, St. Agatha, Presque Isle, Van Buren, and Frenchville (ENSR, 2007).

The Penobscot River Basin drains 8,570 square miles in central Maine. The Penobscot River flows for 105 miles from the confluence of its east and west Branches in Medway, south to its mouth in Penobscot Bay on the Maine coast. The basin is largely undeveloped; approximately 95 percent is forested. Major communities in this basin include Millinocket, Howland, Lincoln, Old Town, Orono, Veazie, Bangor, and Brewer (ENSR, 2007).

The Kennebec River Basin drains 5,900 square miles of west central Maine. The river originates in the Appalachian Mountains at the border with Canada. The upper two-thirds of the basin are hilly and mountainous, and the lower third of the basin has the gentle topography representative of a coastal drainage area. Major communities in this basin include Bingham, Anson, Madison, Norridgewock, Skowhegan, Waterville, Winslow, Augusta, Hallowell, and Gardiner (ENSR, 2007).

The Androscoggin River Basin drains 3,500 square miles in western Maine and northeastern New Hampshire. The river flows 169 miles from Umbagog Lake in Errol, New Hampshire to its mouth at Merrymeeting Bay. Below Rumsford, Maine the river basin becomes hilly and flat and is generally suitable for agriculture. Large communities in this basin include Bethel, Rumford, Mexico, Canton, Jay, Livermore, Lewiston, Auburn, and Brunswick/Topsham (ENSR, 2007).

Figure 7.5-3. Middle Falls along the Androscoggin River



The Saco River Basin drains 1,700 square miles of southwestern Maine. The river flows from the White Mountains of New Hampshire 75 miles to the mouth at Biddeford, Maine. The Saco River Basin is the largest river basin located within the Western Coastal Drainage Basin, which includes many smaller rivers draining directly to the Atlantic Ocean. Large communities within this basin include Fryeburg, Westbrook, and Kennebunk (ENSR, 2007).

The Presumpscot River Basin drains 1,270 square miles of southwestern Maine. The river originates at Sebago Lake and terminates in Portland, Maine, flowing through the towns of Windham, Gorham, and Westbrook before exiting to Casco Bay. The watershed is very hilly and is partially developed. Like the Saco River, this river basin is located within the Western Coastal Drainage Basin (ENSR, 2007).

The St. Croix River Basin drains 1,650 square miles of southeastern Maine. The St. Croix River forms the border between Maine and Canada with a major border crossing at Calais–St. Stephen. The St. Croix River Basin is the largest river basin located within the Eastern Coastal Drainage Basin, which includes many small rivers draining directly to the Atlantic Ocean (ENSR, 2007).

The Merrimack River is formed by the confluence of the Pemigewasset and Winnepesaukee Rivers in New Hampshire and flows 127 miles to the Atlantic Ocean. The lower 49 miles of the river are within Massachusetts. There are two impoundments on the river: the Essex Dam in Lawrence and the Pawtucket Dam in Lowell (ENSR, 2007).

The Connecticut River is the largest river in New England, flowing south from the Connecticut Lakes in northern New Hampshire into Long Island Sound at Old Saybrook, Connecticut. It has a total length of 407 miles and a drainage basin of over 11,250 square miles. The mean discharge is 19,600 cubic feet per second (cuffs). The headwaters of the Connecticut River are at the northern tip of New Hampshire, near the Canadian border. Much of the beginning of the

river's course in the town of Pittsburg is occupied by the Connecticut Lakes, a chain of deep, cold-water lakes (AWCOM, 2011).

The Saint-Francois basin extends from the south shore of the St. Lawrence River in Quebec to northern Vermont. The Saint-Francois River originates in Lake Aylmer north of the basin and flows into the St. Lawrence River at Lake Saint-Pierre. There are nine dikes and dams along the Saint-Francois River, including the Aylmer and Jules-Allard dams, which control the water levels of large lakes and regulate the flow of water upstream from the Saint-Francois River. The Saint-Francois drainage basin has an altitude ranging from 997 feet to 2,500 feet, with the higher altitudes located on the U.S. side in the Adirondack Mountains (Saint-Laurent et al, 2001).

The Richelieu River flows from Lake Champlain 106 miles north, ending in the St. Lawrence River at Sorel. It has a drainage basin of 9,035 square miles, of which 7,570 square miles are in the United States, and a mean discharge of 11,600 cfs. St. Jean, Chambly, and Sorel are important communities on its route. The Chambly Canal permits boats to bypass the rapids at St-Jean-sur-Richelieu and Chambly. The Champlain Canal and Lake Champlain form the U.S. portion of the Lakes to Locks Passage, linking with the Hudson River and allowing navigation using the Richelieu between the St. Lawrence River and New York City and the Erie Canal.

7.5.2.3 Floodplains

Floodplain management seeks to preserve the flood storage capacity for the river corridor. This may be achieved in several ways. Local communities often have floodplain management or zoning ordinances that restrict development within the floodplain. The Federal Emergency Management Agency (FEMA) manages the National Flood Insurance Program (NFIP). FEMA also provides floodplain management assistance, including mapping of 100-year floodplain limits, to over 20,000 communities. The information provided by FEMA's flood management program is useful to CBP planners who seek to avoid effects from flooding conditions. This is most relevant for CBP's border facilities, such as POEs that are planned at locations where rivers define the northern border. The St. John River, the St. Croix River, and Monument Creek in Maine and Halls Stream in New Hampshire are rivers of this type in the New England Region.

7.5.2.4 Transboundary Water Agreements

Boundary Waters Treaty

This treaty provides the basis for resolving disputes involving diverting or obstructing projects impacting water quantity and water across the boundary between Canada and the United States. It establishes an International Joint Commission with authority to approve projects on either side of the border that would alter transboundary water levels. The treaty was initiated between the United States and Great Britain in 1909 to settle issues of distribution of waters of the St. Mary and Milk Rivers for irrigation purposes between Canada and the United States.

7.6 NOISE

7.6.1 INTRODUCTION

The study area contains many soundscapes and noise-sensitive receptors that could experience impacts due to the alternatives that CBP is considering. However, the mere presence of a noise-sensitive area, such as a national park, residence, or school, does not guarantee that it would be significantly impacted by CBP's activities or that the overall impacts would be major under the National Environmental Policy Act (NEPA). As with other topics in this PEIS, the programmatic approach to describing noise is driven by the planning objective of the document and the potential for actual impacts.

7.6.2 AFFECTED ENVIRONMENT

Sound is a physical phenomenon consisting of vibrations that travel through a medium like air and are sensed by the human ear. Noise is defined as any sound that is undesirable because it interferes with communication, is intense enough to damage hearing, or is otherwise intrusive. Human response to noise varies depending on the type and characteristics of the noise, distance between the noise source and the receptor, receptor sensitivity, and time of day. Noise is often generated by activities essential to a community's quality of life, such as construction or vehicular traffic.

Sound varies by both intensity and frequency. Sound pressure level, in decibels (dB), is used to quantify sound intensity. The dB is a logarithmic unit that expresses the ratio of a sound pressure level to a standard reference level. Because the human ear responds differently to different frequencies, "A-weighting" was developed to approximate the frequency response of the human ear. The A-weighting curve has been widely adopted for environmental noise measurement and is standard in many sound level meters. The dBA levels of common sounds of daily life are provided in Table 7.6-1.

Table 7.6-1. Common Sound Levels

Outdoor	Sound level (dBA)	Indoor
Snowmobile	100	Subway train
Tractor	90	Garbage disposal
Downtown (large city)	80	Ringling telephone
Freeway traffic	70	TV audio
Normal conversation	60	Sewing machine
Rainfall	50	Refrigerator
Quiet residential area	40	Library

Notes: dBA = A-weighted decibel. Sound level provided is as generally perceived by an operator or a close observer of the equipment or situation listed.

Source: Harris, 1998.

The dBA noise metric describes steady noise levels, although very few noises are, in fact, constant. Therefore, the measurement day-night sound level (DNL) has been developed. DNL is defined as the average sound energy in a 24-hour period with a 10-dB penalty added to the nighttime levels (10 p.m. to 7 a.m.). DNL is a useful descriptor for noise because: (1) it averages ongoing yet intermittent noise, and (2) it measures total sound energy over a 24-hour period. In addition, Equivalent Sound Level (L_{eq}) is often used to describe the overall noise environment. L_{eq} is the average sound level in dB.

7.6.2.1 Regulatory Review

The Noise Control Act of 1972 (PL 92-574) directs Federal agencies to comply with applicable Federal, state, interstate, and local noise control regulations. In 1974, the USEPA provided information suggesting continuous and long-term noise levels in excess of DNL 65 dBA are normally unacceptable for noise-sensitive land uses such as residences, schools, churches, and hospitals.

State and local governments have the opportunity to regulate noise in their jurisdictions. These regulations are typically guidelines for activities that generate noise and the hours that such activities may be performed. Noise is typically regulated at the local level. A municipal noise ordinance might address the hours that heavy equipment can be operated, the distance heavy equipment can be operated in proximity of noise-sensitive receptors (i.e., schools, hospitals, churches, and residences), and the duration of operation of a single noise source considered to be annoying to the public, such as a diesel-powered generator. Some set specific not-to-exceed noise levels, and others are simple nuisance noise ordinances.

A number of sources of noise may be addressed for rural areas, such as parades, vendors, social engagements with music, and animal noises. Construction noise is typically exempt from noise ordinances in rural areas. In addition, noise regulations in an urban setting take into account the constant noise sources of urban living, such as large heating, ventilation, and air conditioning (HVAC) units, public transportation (trains and buses), emergency vehicles, and heavy traffic. Because urban noise levels are already relatively high, adding a source for an extended period can be highly annoying to some people, hours of construction and operation of heavy equipment are often limited. A typical ordinance in a major city will restrict construction related noise sources between the hours of 10:00 p.m. to 7:00 a.m.

7.6.2.2 CBP Noise Sources

The CBP operates 24 hours a day and 7 days a week. The level of operation can be determined by the measures required to secure the border or necessary for normal facility activities. Table 7.6-2 lists CBP's operations and describes of the noise levels of these activities.

Table 7.6-2. CBP Noise Sources

Operation	Description
Use of mobile surveillance systems (MSS) and surveillance towers	Very little noise is generated by the motor. In remote areas, standby generators may be used to supplement electric power.

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

Operation	Description
Firing ranges and armories	CBP conducts small-arms training at many of its POEs and BPSs. Small-arms weapon fire is clearly audible in areas surrounding these ranges during training activities. Usually these activities are limited to daytime hours.
Maritime patrols	Boating noise is typically audible during marine patrols near the shoreline. This noise is widespread and at most locations only sporadic. The watercraft used are generally selected for their noise-suppression features because of the nature of their mission.
Patrols by foot, horse, off-road vehicle (ORV), and snowmobile	Foot and horse patrols are typically quiet. Noise from ORVs and snowmobiles is audible for a mile or more in remote, quiet areas. This noise is widespread and at most locations only sporadic. Areas near POEs and BPSs may have more concentrated noise associated with these activities.
Added and expanded POEs and checkpoints	This action may require construction, which would end at the completion of the project.
Operation of expanded BPS	Additional personnel would be required for addition or expansion of newly constructed facilities. The possibility of canine facilities, firing ranges, and patrol vehicles may be required for operations at some new/expanded facilities.
Aircraft operations	Air operations at CBP are diverse: Helicopters, fixed-wing aircraft, and unmanned aerial systems (UAS) may be used regularly at some locations, although not all aircraft are used simultaneously. Along with regular operations, training exercises are also a source of aircraft noise at some facilities.
Construction activities	CBP conducts both large and small construction projects. Each has some level of heavy equipment and truck transport noise.
Maintenance activities	Maintenance operations at CBP are as diverse as the facilities themselves. The noise associated with these actions can involve training to maintain each category listed above. These noise sources may be one major repair using heavy equipment, monthly routine maintenance, or daily maintenance in the case of dogs, horses, and vehicles.

Source: USDHS, 2010.

7.6.2.3 Non-CBP Noise Sources

The sources of noise along the border in the New England Region vary greatly, although most of the region is rural or remote. Sounds dominating the rural areas are aircraft overflights, bird and animal vocalizations, and very light traffic. Farming is a major activity in some of the rural areas identified with the project area. Farming is seasonal in this region and may create major sources of noise during planting, and even more during harvest in August through October, when several large combines may operate concurrently. There are no major cities in the New England Region. A complete list of counties with their population and current background noise levels can be found in Appendix O. Notably, these levels are estimated average background levels based on population. Actual site-specific levels may vary base on location.

7.6.2.4 Background Noise Levels

Estimated background noise levels for areas within 100 miles of the border are shown in Figure 7.6-1 and described in Table 7.6-3. The majority of areas within 100 miles of the border would be classified as remote or rural residential and are isolated, far from significant sources of sound.

Townships and small cities are scattered throughout the 100-mile buffer area; however, more remote land areas cover most of the project area. These smaller cities can be described as rural-residential and quiet-commercial.

Figure 7.6-1. Background Noise Levels in the New England Region

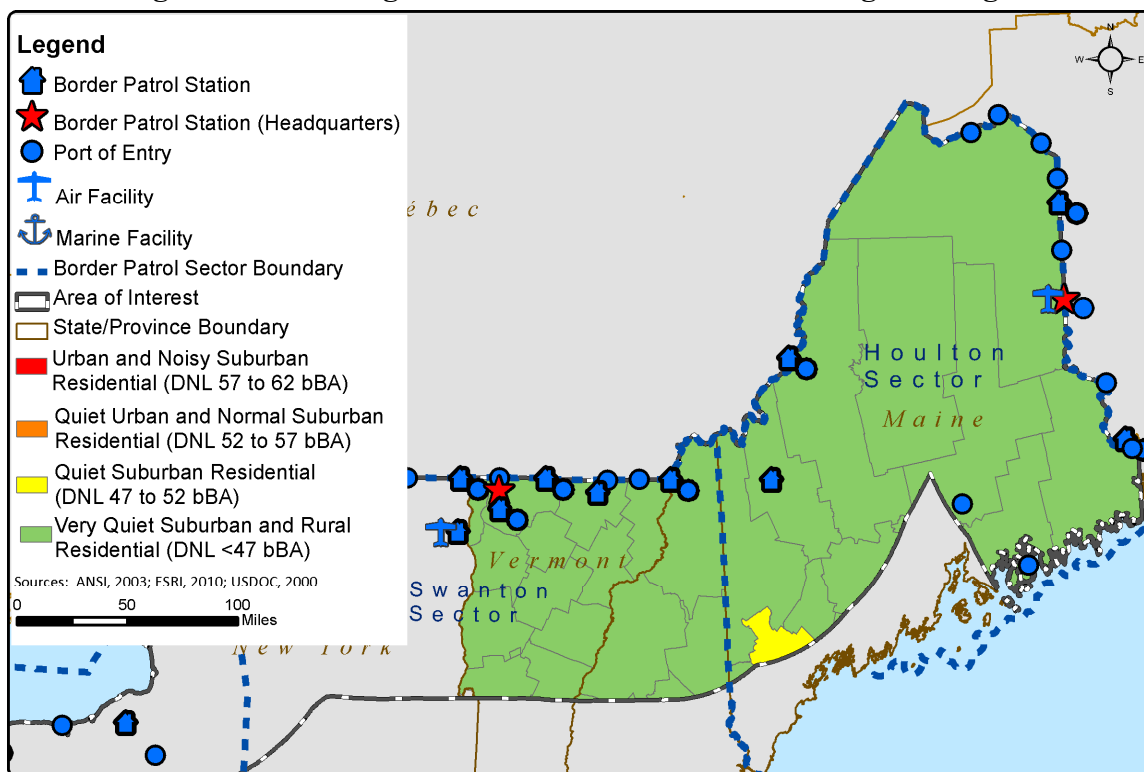


Table 7.6-3. Description of Background Noise Levels

Intensity Level	Example Land Use Category	Average Residential Intensity (people per acre)	Leq (dBA)		
			DNL	Daytime	Nighttime
Low	Quiet suburban residential	2	49	48	42
Medium-low		4	52	53	47
Medium	Quiet urban residential	9	55	56	50
Medium-high	Quiet commercial, industrial, and normal urban residential	16	58	58	52
High		20	59	60	54

Source: ANSI, 2003.

7.6.2.5 National Parks

The National Park Service (NPS) recognizes the natural soundscape of each national park unit as an inherent resource, and manages this resource in order to “restore degraded soundscapes to the natural conditions wherever possible, and protect natural soundscapes from degradation due to noise” (USDO, 2000). Non-impairment of natural soundscapes is mandated by the Organic Act

of 1916 and is part of the NPS management goals and objectives. Each region of the project area has locations of special interest such as units of the national park system. Major units within 100 miles of the border in the New England Region include Acadia National Park with total area of 48,600 acres (USEPA, 2010) and Saint Croix Island International Historic Site in Maine.

7.7 CLIMATE CHANGE AND SUSTAINABILITY

7.7.1 INTRODUCTION

According to the 2009 U.S. Global Change Research Program (USGCRP) report, “Global Climate Change Impacts in the United States,” documented impacts to the Nation from climate change include increased average temperatures, more frequent heat waves, high-intensity precipitation events, sea-level rise, more prolonged droughts, and more acidic ocean waters, among others. Global and national temperature changes are not distributed evenly. Greater increases occur at the high, northern latitudes (CEQ, 2010). In 2010, the Department of Homeland Security (DHS) identified global climate change as a long-term trend and global challenge that threatens America’s national-security interests (USDHS, 2010).

Sustainability and smart growth are approaches to human activity that aim to meet the needs of the present without compromising the ability of future generations to meet their own needs. For CBP, the concepts of sustainability and smart growth include the ability to adjust to changing geopolitical realities while preserving the environment and working to improve the quality of life for American residents and visitors.

To reduce environmental impacts and address the challenge of limited resources, DHS prepared a “Strategic Sustainability Performance Plan” to promote sustainable planning, design, development, and operations. The guidelines aim to decrease energy use, minimize reliance on traditional fossil fuels, protect and conserve water, and reduce the environmental impact of materials use and disposal. CBP’s overarching goal is to size, plan, and carry out proposed development in a manner that is sustainable and that works to preserve and protect limited resources.

7.7.2 AFFECTED ENVIRONMENT

7.7.2.1 Climate Regions of the Northern Border—Overview

The climate along the northern border is characterized by mild summers and very cold to extremely cold winters. January is the coldest month. July is the warmest month throughout the entire project area, and its temperature can fluctuate 20-30 degrees Fahrenheit between day and evening (Idcide, 2010). Precipitation is evenly distributed throughout the year but is considerably higher in the New England Region than in other northern border regions. The average annual precipitation across the entire northern border is approximately 31 inches. There is one recognized climatic zone within the New England Region: Humid Continental Climate. A discussion of this zone is provided in the following subsection.

7.7.2.2 Climate in the New England Region

Humid Continental Climate

The Humid Continental Climate is found in the interior regions of continents within temperate regions of the midlatitudes. Regions with this climate experience variable weather conditions due to their location within the midlatitudes and the year-round influence of the polar front. They are located between polar-type and tropical air masses where collisions of these air masses cause precipitation from the uplift of the moist and less dense tropical air mass.

These regions have great variability in seasonal temperatures because they are in the middle of the continent and are typically removed from the moderating influences of oceans. During the winter, Arctic air masses sweep into the northern portions of these regions, bringing extremely cold temperatures.

In North America, the Gulf of Mexico and the Caribbean Sea are sources of moisture for the maritime tropical air masses that carry humid air up into the eastern and central regions of the country, causing most of the humidity and precipitation that occur in these areas.

A diversity of ecosystems is found in the Humid Continental Climate. Mixed broadleaf deciduous forest is common in the southern and eastern portions of the climate in the United States. Grasslands may be found toward the West, where the precipitation is less. The Humid Continental Climate has two subtypes, described below.

Humid Continental Climate (Warm Summer Subtype)

The Warm Summer Subtype can be found in the eastern and midwestern regions of the United States and is characterized by hot, humid summers and occasional cold waves in the winter.

Humid Continental Climate (Cool Summer Subtype)

The Cool Summer Subtype can be found in the New England, Great Lakes, and upper-Midwest regions of the United States and is characterized by cooler summers and very cold temperatures in the winter (Ritter, 2006).

7.7.2.3 Climate Change in the United States—New England Regional Assessment

Historically, New England has experienced significant variability and extreme events related to weather and climate. Floods, droughts, heat waves, and severe storms are characteristic. For example, 7 major tropical storms have crossed the mid-Atlantic region since 1986, and 6 of the last 20 years have been characterized by significant drought. Average annual temperature increases of as much as 4 degrees Fahrenheit (2 degrees Celsius) over the last 100 years have occurred along the coastal margins from the Chesapeake Bay through Maine. Precipitation has generally increased, with increases greater than 20 percent over the last 100 years occurring in much of the region. Precipitation extremes appear to be increasing while the amount of land area experiencing drought appears to be decreasing. For the region as a whole, the period between the first and last dates with snow on the ground has decreased by seven days over the last 50 years.

New England has among the lowest rates of projected future warming among regions of the United States. Within these rates, winter minimum temperatures show the greatest change, with projected increases ranging from four degrees Fahrenheit to as much as nine degrees Fahrenheit (two degrees Celsius to five degrees Celsius) by 2100, with the largest increases in coastal regions. Maximum temperatures are likely to increase much less than minimums, again, with the largest changes in winter. The variability in precipitation in the coastal areas of New England is projected to increase (USGCRP, 2010).

7.8 LAND USE

7.8.1 INTRODUCTION

This section characterizes land uses in the New England Region and describes some land use on the Canadian side of the border that could be affected by some CBP activities. For example, construction projects that introduce noise and light pollution along the border could affect the suitability of land to support its current or planned use on both sides of the border. Other actions, however, such as direct removal of land from existing uses for CBP-related infrastructure construction, would not affect the Canadian side. The USGS and Natural Resources Canada (NRC) define land cover and land use classifications.

7.8.2 AFFECTED ENVIRONMENT

This section describes land use and cover for the New England Region. The summary tables characterize land use and cover according to the USGS Multi-Resolution Land Characteristics Consortium (MRLC) National Land Cover Database (NLCD) and USGS's Gap Analysis Program (USDOI, 2001; USDOI, 2010). The summary tables for Canada summarize land use and cover according to NRC's advanced very high resolution radiometer (AVHRR) land cover data and NRC's protected-areas data on regions of 10 sq km or larger compiled by the Canadian Council on Ecological Areas (CCEA) (NRC, 2009; NRC, 2007).

7.8.2.1 Land Cover and Related Land Uses in the New England Region

The New England Region covers about 26 million acres, approximately 78.7 percent of the land area of the states in the region (Maine, New Hampshire, and Vermont). The most prevalent land cover type within the study area is forested (72.0 percent). Forests cover the vast majority of the study area in each state, as well. Water/wetlands (12.4 percent) are the next most prevalent land cover type (Table 7.8-1). Generally, the land cover within the study area is representative of the land cover profile of each of the region's states.

Table 7.8-1. Land Cover in the New England Region

Border State		Total Land Area (Thousands of Acres)	Developed (%)	Cultivated Crops (%)	Pasture/Hay (%)	Herbaceous (%)	Forested (%)	Water/Wetlands (%)	Snow/Ice/Barren Land* (%)
Maine	Study Area	18,252	2.6	2.1	1.3	0.8	70.8	14.5	7.9
	Statewide	20,798	3.5	2.1	1.8	0.8	70.0	14.5	7.3
New Hampshire	Study Area	2,975	3.7	1.3	1.3	0.3	85.0	6.0	2.4
	Statewide	5,928	7.5	1.2	3.3	0.3	78.1	7.3	2.2
Vermont	Study Area	4,650	5.4	5.3	10.6	0.2	68.4	8.3	1.8
	Statewide	6,150	5.3	4.3	9.9	0.2	71.7	7.0	1.6
New England Region	Study Area	25,877	3.2	2.6	3.0	0.7	72.0	12.4	6.2
	Selected States	32,876	4.5	2.4	3.6	0.6	71.8	11.8	5.3
TOTAL United States**		2,053,000	5.0	21.9		14.1	31.2	27.7	

The New England Region includes all areas 100 miles south of the U.S.-Canada border in Maine, New Hampshire, and Vermont.

* “Barren Land” includes the NLCD land classification “Shrub/Scrub.”

** Data for the United States as a whole are shown as calculated in USEPA, 2008. This report sums land cover categories for cultivated crops and pasture/hay to account for total agricultural cover, and sums snow/ice, barren, and wetlands land cover. This table aggregates the USEPA, 2008 calculation of water and shrub/scrub land cover with their category of snow/ice/barren/wetlands, though water alone covers 1.6 percent of the land area in the United States, while snow/ice/barren/wetlands cover 5.7, and shrub/scrub covers 20.4 percent.

Source: (USDOJ, 2001).

The study area includes a high percentage of forested area relative to the entire country; the levels of herbaceous land cover and agricultural land (cultivated crops and pasture/hay) in the study area are low compared to the Nation. The study area has a similar percentage of snow/ice/barren and water/wetlands relative to the country as a whole, and slightly less developed area than the country.

Figures 7.8.1 and 7.8.2 show maps of land cover and use in the New England region.

Recreation also occurs on other land not specifically designated for the activity and land other than that profiled in Section 7.17 (Recreation), which focuses specifically on major Federal recreation sites. For example, wildlife viewing or hiking may be permitted on some conservation or natural areas in the study area. In addition, hunting and snowmobiling may occur on public or private forested land areas. Absent information on the specific distribution of recreational activities across the landscape, this analysis relies on the above categories of land as a low-end estimate of the area in which recreation is likely taking place.

Recreational land use in the New England Region accounts for about 516,000 acres or 2.0 percent of total land area, which is less than the share of recreational land use for the country as a whole (10.1 percent) (Table 7.8-2). Parks and recreation departments of the various states manage just under half of the land with recreational uses in the region; Baxter State Park in Maine is the largest single area. NPS manages just less than 80,000 acres; another 75,000 have private conservation landowners. Cities are also significant recreation landowners in this region, constituting 30,000 acres of recreational land, much of which is in Maine. Section 4.17 discusses the potential impacts of CBP activities on lands designated and otherwise used for recreational purposes. Appendix I provides the profiles of major Federal U.S. and Canadian protected and set-aside areas often used for recreational purposes in the study area

Conservation areas in the New England Region account for about 2 million acres or 7.8 percent of total land area (Table 7.8-3). This percentage is significantly lower (about half) of the proportion of conservation land countrywide. State land management departments manage the greatest amount of conservation land in the New England Region where conserved areas are generally numerous and small.

Table 7.8-2. Recreational Land Use in the New England Region

Border State		Recreational Land Use* (Thousands of Acres)	Share of Recreational Land Use (%)
Maine	Study Area	370	2.0
	Statewide	444	2.1
New Hampshire	Study Area	100	3.4
	Statewide	794	13.4
Vermont	Study Area	46	1.0
	Statewide	491	8.0
New England Region	Study Area	516	2.0
	Selected States	1,729	5.3
TOTAL United States		208,088	10.1

The New England Region includes all areas 100 miles south of the U.S.-Canada border in Maine, New Hampshire, and Vermont.

* Recreation lands all lands clearly identified by USGS title of land type as intended for recreation (e.g., parks, scenic areas, or recreation areas).

Source: (USDOJ, 2010).

Table 7.8-3. Conservation Land Use* in the New England Region

Border State		Conservation Land Use (Thousands of Acres)	Share of Conservation Land Use (%)
Maine	Study Area	1,259	6.9
	Statewide	1,278	6.1
New Hampshire	Study Area	501	16.9
	Statewide	739	12.5
Vermont	Study Area	271	5.8
	Statewide	658	10.7
New England Region	Study Area	2,031	7.8
	Selected States	2,675	8.1
TOTAL United States		300,149	14.6

The New England Region includes all areas 100 miles south of the U.S.-Canada border in Maine, New Hampshire, and Vermont.

* Conservation lands are all lands clearly identified by USGS title of land type as intended for conservation (e.g., reserves, preserves, conservation land, and natural areas).

Source: (USDOJ, 2010).

7.8.2.2 Land Cover and Related Land Uses in the Areas North of the New England Region

This section considers resources north of the border from the New England Region extending two miles into Canada. This area covers about 1.85 million acres (Table 7.8-4). Over 90 percent of the area north of the New England Region is forested. Pasture/hay is the next most prevalent type, although it only constitutes 4.3 percent of the land area, followed by water/wetlands, which make up just over 3 percent. Much like each of the provinces in the study area, and the country as a whole, the study area has a large proportion of forested land, and low proportions of developed areas, agricultural lands (though greater amounts of pasture/hay than cultivated crops), and water/wetlands. The study area has a low proportion of snow/ice/barren land as compared to Canada as a whole.

Table 7.8-4. Land Cover in Canada North of the New England Region

Border Province		Total Land Area (Thousands of Acres)	Developed (%)	Cultivated Crops (%)	Pasture/Hay (%)	Forested (%)	Water/Wetlands (%)	Snow/Ice/Barren (%)
New Brunswick	Study Area	288	0.0	0.0	4.3	89.6	5.9	0.3
	Province	18,065	0.2	0.0	1.8	95.7	1.0	1.3
Nova Scotia	Study Area	1,068	0.0	0.0	0.0	97.9	2.1	0.0
	Province	13,816	0.4	0.0	5.0	89.7	1.6	3.2
Quebec	Study Area	495	0.0	0.0	13.6	83.1	3.4	0.0
	Province	301,185	0.1	0.0	2.6	56.2	5.8	35.2
Selected Provinces	Study Area	1,851	0.0	0.0	4.3	92.6	3.1	0.0
	Total for Selected Provinces	333,067	0.1	0.0	2.7	59.8	5.4	32.0
TOTAL CANADA		2,071,476	0.1	1.7	6.0	46.7	7.3	38.2

* The areas north of the New England Region in Canada include the portions of New Brunswick, Nova Scotia, and Quebec provinces extending two miles north of the U.S.-Canada border.

Source: (NRC, 2009).

Table 7.8-5 indicates that no areas are identified as recreational land in the areas north of the New England Region in contrast to the proportion of recreational land use in Canada as a whole (6.1 percent).

Table 7.8-6 shows that conservation areas in the areas north of the border from the New England Region make up about 129,000 acres, or about 6.9 percent of the total study area, which is greater than the proportion of conservation areas in the country as a whole (4.7 percent).

Table 7.8-5. Recreational Land Use in Canada North of the New England Region

Border Province		Recreational Land Use (Thousands of Acres)	Share of Recreational Land Use (%)
New Brunswick	Study Area	0	0.0
	Province	162	0.9
Nova Scotia	Study Area	0	0.0
	Province	353	2.6
Quebec	Study Area	0	0.0
	Province	2,166	0.7
Selected Provinces	Study Area	0	0.0
	Total for Selected Provinces	2,681	0.8
TOTAL CANADA		126,389	6.1

*Areas north of the New England Region in Canada include the portions of New Brunswick, Nova Scotia, and Quebec Provinces extending two miles north of the U.S.-Canada border.

Source: NRC, 2007.

Note: Recreation lands are all lands clearly identified in the NRC dataset as intended for recreation, for example, described as parks or recreation areas.

Table 7.8-6. Conservation Land Use in Canada North of the New England Region

Border Province		Conservation Land Use (Thousands of Acres)	Share of Conservation Land Use (%)
New Brunswick	Study Area	23	8.1
	Province	389	2.2
Nova Scotia	Study Area	87	8.1
	Province	1,361	9.9
Quebec	Study Area	19	3.8
	Province	17,325	5.8
Selected Provinces	Study Area	129	6.9
	Total for Selected Provinces	19,075	5.7
TOTAL CANADA		98,234	4.7

*Areas north of the New England Region in Canada include the portions of New Brunswick, Nova Scotia, and Quebec provinces extending two miles north of the U.S.-Canada border.

Source: (NRC, 2007).

Note: Conservation lands are all lands clearly identified in the NRC dataset as intended for conservation; for example, described as reserves, preserves, protected areas, habitat areas.

Figure 7.8-1. Land Cover in the New England Region

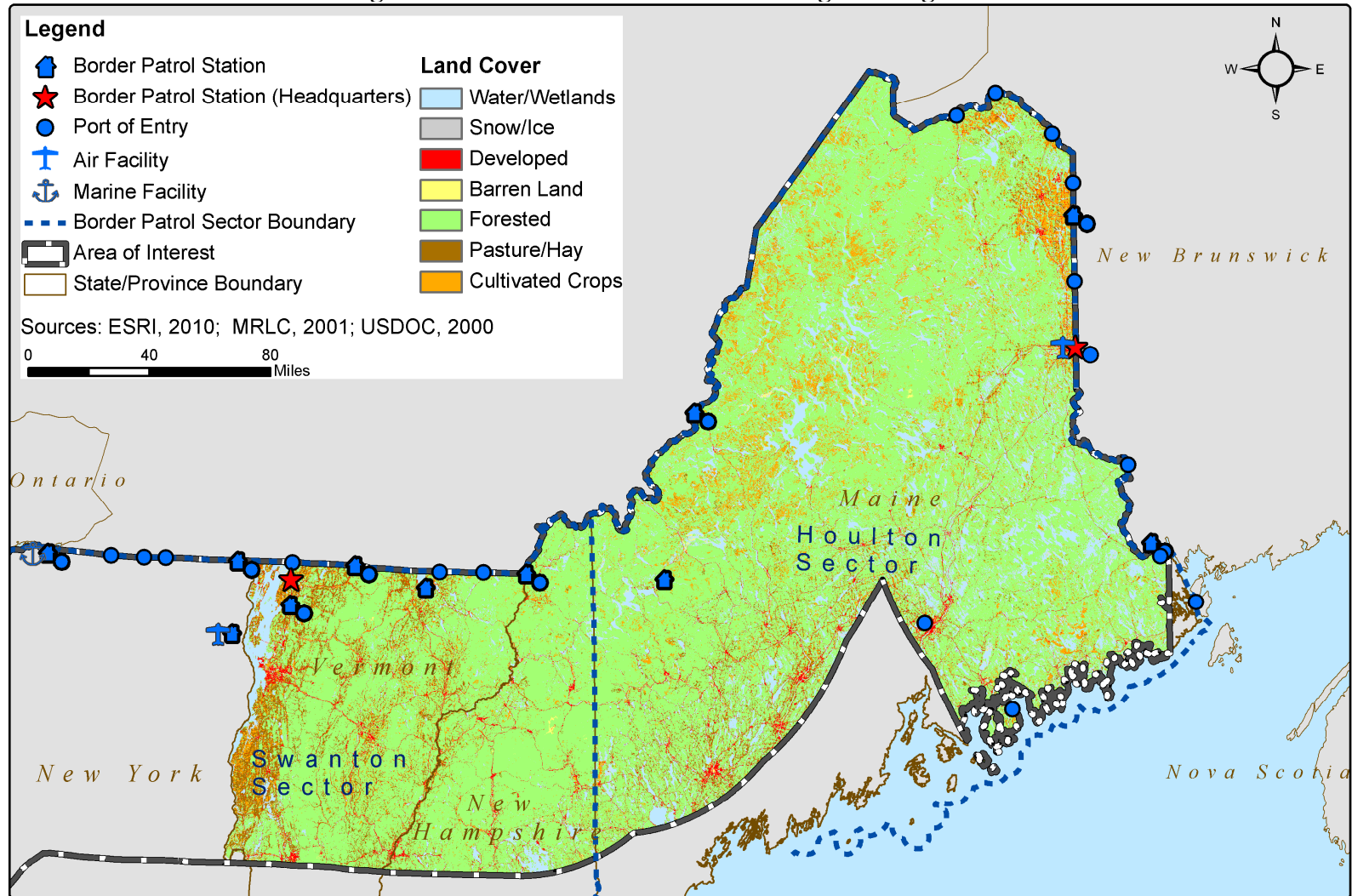
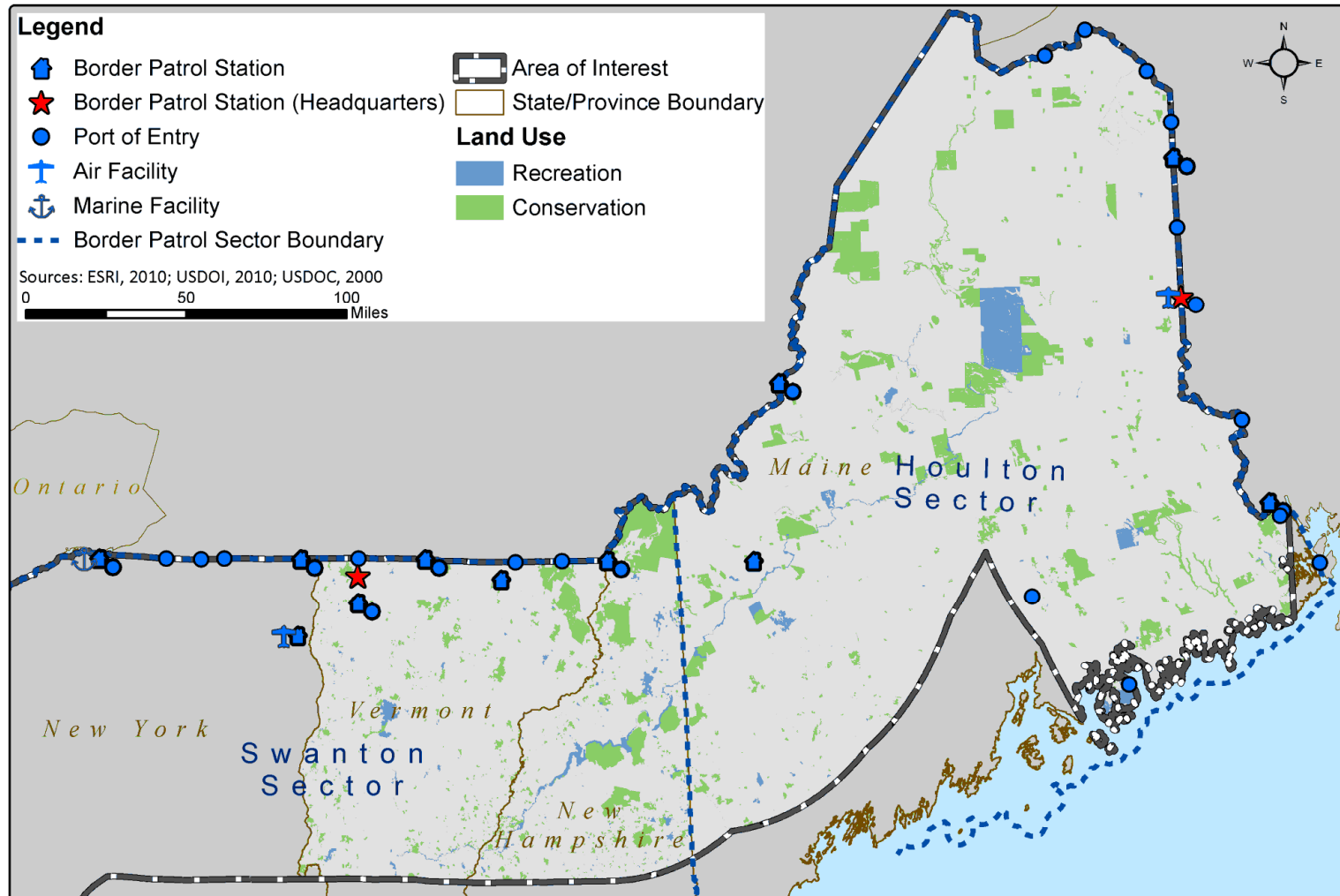


Figure 7.8-2. Land Use in the New England Region



7.8.2.3 Land Ownership in the New England Region

The major categories of land ownership in the New England Region in the United States are Federal (4.4 percent), state (5.2 percent), and private (11.0 percent) (Table 7.8-7). Tribal lands were not identified in this region. Only about 20.6 percent of the New England Region is classified according to landowner, thus this discussion is subject to significant gaps in landowner information. Federal lands include national parks, national forests, conservation areas, and military lands, and are managed by the Bureau of Land Management (BLM), Bureau of Reclamation (BOR), Department of Defense (DOD), Department of Energy (DOE), USFWS, U.S. Forest Service (USFS), NPS, or are classified as “other Federal land.” State lands are properties owned by state departments of conservation, departments of land, departments of natural resources, departments of transportation, fish and wildlife, historical societies, state land boards, parks and recreation, or classified as “other state land.” Tribal land accounts for regions owned by Native American Tribes and are recognized by the Federal Government. Federal laws and the Constitution grant Tribal Nations greater sovereignty than that granted to state or local governments. Private lands are those owned by the Audubon Society, the Rocky Mountain Elk Foundation, The Nature Conservancy (TNC), private universities, other conservation groups, or private non-profits, or classified as “private conservation easement/conservation deed restriction,” “private conservation land,” or “private institution–managed for biodiversity.”

The New England Region includes about 1.1 million acres of Federal land, accounting for 4.4 percent of land ownership. The USFS manages the majority of Federal land in this region, much of which sits within New Hampshire’s White Mountain National Forest. In addition, the USFWS and the NPS each manage slightly less than 100,000 acres.

Approximately 1.4 million acres of state land are in the New England Region, accounting for 5.2 percent of land ownership. The State Department of Conservation in Maine is the largest state landowner in the region, with about 640,000 acres, much of which is state trust land. The Maine and Vermont state parks and recreation agencies own another 400,000 acres. The share of state land ownership in the region is nearly half that of the United States as a whole.

Native American issues in this region are identified and discussed in Section 7.11 of this report.

The New England Region includes about 2.8 million acres classified as private land. The majority of this private land occurs in Maine (2.1 million acres) in over 50 private conservation refuges, easements, sanctuaries, forests, and preserves. The share of private land ownership in the study area is substantially greater than the share of private land ownership for the country as a whole. Figure 7.8-3 maps known landowner types across the New England Region.

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

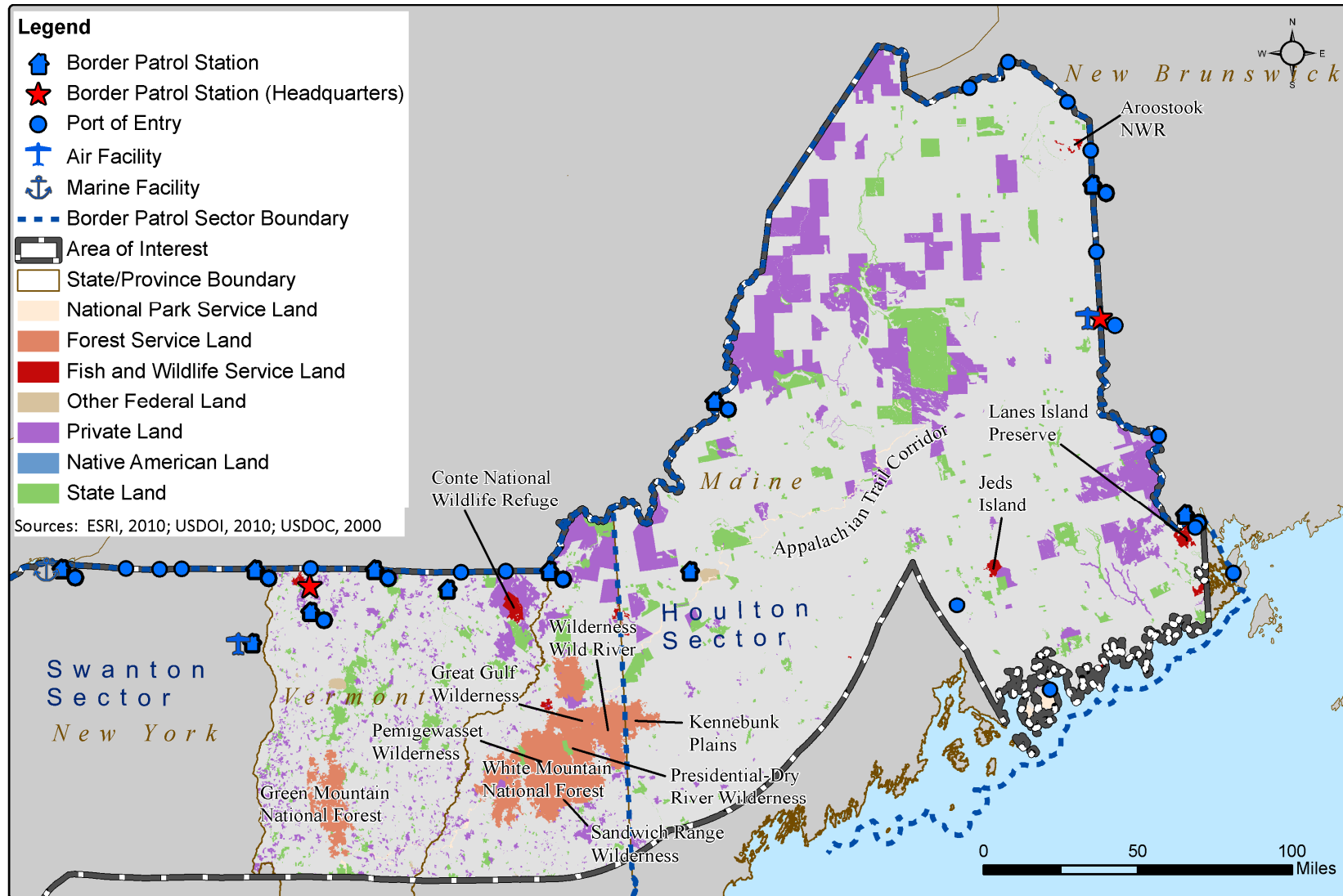
Table 7.8-7. Land Ownership in the New England Region

Border State (Thousands of Acres)		Federal Land		State Land		Tribal Land		Privately Held Conservation Land		Total Conservation & Tribal Lands	
		Thousands of Acres	Percentage of Study/ State Area	Thousands of Acres	Percentage of Study/ State Area	Thousands of Acres	Percentage of Study/ State Area	Thousands of Acres	Percentage of Study/ State Area	Thousands of Acres	Percentage of Study/ State Area
Maine	Study Area 18,000	180	1.0	923	5.1	0	0	2,135	11.9	3,238	18
	Statewide 19,470	194	1.0	972	5.0	0	0	2,159	11.1	3,325	17
New Hampshire	Study Area 2,969	757	25.5	129	4.3	0	0	302	10.2	1,188	40
	Statewide 5,730	781	13.6	22	0.4	0	0	501	8.7	1,304	23
Vermont	Study Area 4,674	201	4.3	303	6.5	0	0	415	8.9	919	20
	Statewide 9,217	446	4.8	355	3.9	0	0	507	5.5	1,308	14
New England Region	Study Area 25,886	1,139	4.4	1,356	5.2	0	0	2,852	11.0	5,347	21
	Selected States 34,417	1,421	4.1	1,552	4.5	0	0	3,167	9.2	6,140	18
Total United States		657,885	32	189,314	9.2	100,574	4.9	15,918	0.8	963,691	47

*The New England Region includes all areas 100 miles south of the U.S.-Canada border in Maine, New Hampshire, and Vermont.. Land ownership estimates do not add up to 100 percent for a given area due to gaps in information regarding land ownership within border states. Sources: (USDOl, 2010), (USDOC, 2012).

Note: For a complete discussion of Native American resources along the northern border, refer to Section 7.11 of this report.

Figure 7.8-3. Land Ownership in the New England Region



7.8.2.4 Land Ownership in Canada North of the New England Region

Federal and provincial land ownership is characterized using the protected areas data compiled by NRC. As a result, ownership (excluding aboriginal lands) is only determined for about 10.8 percent of the entire land area of the country. The following discussion, therefore, reflects only the relatively small portion in Canada for which landowners are identified.

The share of Federal land ownership in Canada north of the New England Region is significantly less than that throughout the country, as highlighted in Table 7.8-8 (0.1 percent in the region versus 4.8 percent in the country). Proportionally, provincial ownership in the region is similar to that in Canada as a whole.

Aboriginal land is characterized using NRC data of Indian reserves, land claim settlement lands, and related aboriginal designations. As shown in Table 7.8-9, the share of aboriginal land in the areas in Canada north of the border from the New England Region (0.4 percent) is less than the share of aboriginal land countrywide (7.4 percent).

Table 7.8-8. Land Ownership in Canada North of the New England Region

Border Province		Federal Land		Provincial Land	
		Total Land Area	Share (%)	Total Land Area	Share (%)
New Brunswick	Study Area	0	0.0	23	8.1
	Province	128	0.7	423	2.3
Nova Scotia	Study Area	0	0.0	87	8.1
	Province	931	6.7	783	5.7
Quebec	Study Area	2	0.3	17	3.5
	Province	655	0.2	18,837	6.3
Selected Provinces	Study Area	2	0.1	127	6.9
	Total for Selected Provinces	1,714	0.5	20,043	6.0
TOTAL CANADA		98,844	4.8	125,779	6.1

*Areas north of the New England Region in Canada include the portions of New Brunswick, Nova Scotia, and Quebec provinces extending two miles north of the U.S.-Canada border.

Source: (NRC, 2007).

Notes: Federal lands are all lands with the designation national park, migratory bird sanctuary, national wildlife area, Prairie Farm Rehabilitation Administration, and marine protected area. Provincial lands are all lands designated under provincial administration, which often includes funding and support from Federal agencies.

Table 7.8-9. Aboriginal Lands in Canada North of the New England Region

Border Province		Aboriginal Lands (Thousands of Acres)	Share (%)
New Brunswick	Study Area	1	0.3
	Province	40	0.2
Nova Scotia	Study Area	2	0.2
	Province	29	0.2
Quebec	Study Area	5	1.1
	Province	1,015	0.3
Selected Provinces	Study Area	8	0.4
	Total for Selected Provinces	1,083	0.3
TOTAL CANADA		152,965	7.4

*Areas north of the New England Region in Canada include the portions of New Brunswick, Nova Scotia, and Quebec provinces extending two miles north of the U.S.-Canada border.

Source: (NRC, 2010).

7.8.2.5 Land Use Management

As noted in Chapter 3, for projects on non-Federal lands, CBP will comply with state and local land use regulations where applicable or where not specifically preempted from doing so, as long as such compliance does not impede execution of its congressionally mandated mission.

7.8.2.6 Consistency with Enforceable Policies of the Coastal Zone Management Act

In the New England Region, CBP's activities in Maine have coastal zones relevant to the northern border and will have to comply with the appropriate state "enforceable policies" outlined below. Most CBP activities in the state coastal zones are expected to fall in the negligible to moderate range and to comply with the Federal consistency requirements and procedures established by the individual states, identified below for Maine.

Maine

Maine's northern border coastal zone includes the inland line of coastal towns on tidewaters and all islands in the 100-mile zone of interest south of the border. The State Planning Office (SPO) administers the Maine Coastal Zone Management Program (CZMP) and enforcement of state laws that affect the coastal zone. CBP's activities that affect the coastal zone must be consistent with the following enforceable state policies that are part of the Maine Coastal Program (MSPO, 2006):

- Natural Resources Protection Act;
- Mandatory Shoreline Zoning Law;
- Site Location of Development Law;
- Erosion Control and Sedimentation Law;
- Storm Water Management Law;
- Subdivision Law;
- Marine Rivers Act;
- Maine Waterway Development and Conservation Act;
- Coastal Management Policies Act;
- Protection and Improvement of Air Law;
- Protection and Improvement of Waters Act;
- Nutrient Management Act Land Use Regulation Law;
- Maine Hazardous Waste, Septage and Solid Waste Management Act;
- Nuclear Facility Decommissioning Laws;
- Oil Discharge Prevention and Pollution Control Law;
- Marine Resources Law;
- Coastal Barrier Resources System Act;
- Marine Endangered Species Act; and,

- Fee schedule.

“The Maine Guide to Federal Consistency Review” contains the procedures for demonstrating consistency with the enforceable policies of the Maine CZMP (MSPO, 2006).

7.9 AESTHETIC AND VISUAL RESOURCES

7.9.1 INTRODUCTION

Visual resources include those features that define the visual character of an area—natural features, vistas, or viewsheds, and even urban or community visual characteristics that include architecture, skylines, or other characteristics. Visual resources and aesthetics are important due to their unique qualities and the responses they inspire in humans. This section provides the analytical tools to conduct a precise visual impact assessment for future site-specific projects or activities; it also offers examples of the types of landscapes that exist along the border. It analyzes how, in which settings, to what extent, and with which viewer groups the various CBP activities might create visual impacts. It does not characterize every potential vista or visual landscape along the entire northern border, but does provide guidelines for minimizing, mitigating, or avoiding such impacts.

The Visual Resource Management (VRM) system developed by BLM defines the visual sensitivity of an area and the potential effect of a project on a visual resource. It assigns ratings of Classes I to IV based on combinations of scenic quality, sensitivity levels, and distance zones (for the Framework for Characterizing Resource Impacts on the northern border, see Chapter 3, Section 3.9).

7.9.2 AFFECTED ENVIRONMENT

7.9.2.1 Affected Landscapes

Four broadly defined landscapes occur within the potential settings of the proposed project. These four landscapes are: natural, rural, urban, and industrial (USDOT, 1999), and are briefly described below.

Natural Landscapes

Natural landscapes are those in which natural landforms and vegetation predominate, and signs of human activity are not apparent (USDOT, 1999). Coastlines, water bodies, mountains, and areas of varied relief are the most striking and tend to be the most conspicuous. Some natural landscapes are designated specifically for outdoor recreation. BLM, USFS, USFWS, NPS, and state and local parks own most of these recreational lands. This region has a considerable amount of forested area; Maine, for instance, is 70.8 percent forested. As in the western United States, geological landforms, such as mountains, rock outcroppings, ridges, escarpments, and valleys, dominate the natural landscape. Even where significant topographic relief occurs, the heavily forested landforms are undistinguished and tend to confine a viewer's attention to the immediate foreground. Many of these landscapes would fall into the "A" category for scenic quality and thus be sensitive to visual modifications. Located in northern New Hampshire (making up 14% of the state) and extending into southwestern Maine, White Mountain National Forest has nine managed scenic areas within its 784,505 acres, managed to protect outstanding scenery making it an important natural landscape.

Saint John Valley, Maine



Source: (USDOl, 2006).

Rural Landscapes

Rural landscapes include features such as croplands, orchards, fields, fences, and farm-related structures (USDOT, 1999). While border POEs and BPSs along the U.S.-Canadian border tend to be in rural, less densely populated areas well outside of major cities, the majority of the population in the study area lives in larger population centers. Agricultural areas are predominantly flat or gently rolling hills; these landscapes tend to be restricted to valleys and lowlands and are not typically found at higher elevations or in areas with complex topography. Native vegetation grows in confined areas where land is steep or soils are unproductive. Views may extend for some distance, with vertical elements typically consisting of relatively low farm buildings, silos, water towers, utility poles, and trees. Distinct geometric patterns, such as rectangular or circular fields and property boundaries divided by section lines, may characterize the landscape. Towns are small and have relatively low skylines. In general, the few structures in such areas can be of aesthetic interest. Agriculture greatly influences the landscape. Land-use groups can sometimes categorize different agriculture practices. Other rural areas include forests or desert, which are influenced by roadways, the presence of small towns, and land-clearing activities, such as timber harvesting, strip mining, ski areas, and large reservoirs.

Urban Landscapes

These landscapes represent only a fraction of the Nation's entire land area, but are the dominant visual environment of roughly three-quarters of the American population (USDOT, 1999). Residential and suburban areas represent much of the urban landscape, with centralized primary commercial centers and business districts defining the most dominant visual characteristics. The scale of development in major urban areas is large and dominated by structures, highways, infrastructure, and trees. Urban landscapes can absorb a great degree of visual change because they already contain commanding visual features. Most urban landscapes are clustered around

areas of usable natural resources, such as waterways. Most of the major cities cluster around ocean access. Although these large urban areas are not the most significant features in the New England Region, they still represent the visual setting for the largest portion of the population. Here, as well as along other parts of the border, the POEs and BPSs are more situated in rural areas. These landscapes already contain sizable amounts of infrastructure and would be able to absorb a greater amount of change and more additions to the visual environment than rural or natural landscapes. The largest concern in urban landscapes is the number and sensitivity of the visual user groups (see Section 7.9.2.3).

Industrial Landscapes

Heavy and light industrial landscapes tend to be scattered, situated in specific zones or districts, such as along roads and waterfronts or near airports. Unlike the Great Lakes Region, relatively few industrial landscapes exist along the northern border in the New England Region. Such landscapes can absorb the greatest degree of visual change, due to existing dominant visual features and their generally low scenic quality (“C” category). These landscapes are usually classified as Visual Resource Class IV in which major changes to the visual environment can occur without major impacts to the visual environment or viewer groups.

Industrial Plant on River



Source: (USDOI, 2008).

7.9.2.2 Areas with High Visual Sensitivity

Visual sensitivity refers to the level of viewer awareness and the value placed on a particular scene. Some areas have a high degree of visual sensitivity, usually due to their unique visual features or their use by recreational users. The BLM considers these areas as Visual Resource Class I in terms of scenic quality. Typically, highly sensitive areas are significant to the general public. In these areas, most modifications to the visual environment would result in a major adverse impact and any visual impact should be avoided or mitigated if possible. Natural areas with Federal or state protection often fall into this category. Unlike the western states, the New England Region does not have as large a proportion of public lands sensitive to visual impacts.

7.9.2.3 Affected User Groups

Specific viewer groups within the study area can gauge viewer sensitivity and assure the selection of appropriate representative viewpoints during the visual impact evaluation. While

POEs and BPSs along the U.S.-Canadian border are generally in rural, less densely populated areas outside of major metropolitan areas, most of the population in the study area lives in larger population centers. The following four categories of viewer/user groups were identified within the study area. In the United States, approximately 2.2 million people live in the New England Region (Table 7.10-1). The segment of the population living in border communities accounts for 67.5 percent of the population living in the New England Region states of Maine, New Hampshire, and Vermont. Maine has the largest population living in the region, about 1.2 million people. The border communities in New Hampshire and Vermont are less populated.

Commuters and Through Travelers

These viewers pass through the study area on a regular basis in automobiles on their way to work or other destinations. On most roads within the study area, the views are from street level. Typically, drivers have limited views of CBP's infrastructure and activity, except at locations where CBP's actions cross the road. Commuters and through travelers are typically moving, have a relatively narrow visual field due to roadside vegetation or structures, and generally are preoccupied with traffic and navigating the roadways. For these reasons, commuters and through travelers' perception of (and sensitivity to) visual quality and changes in the visual environment are likely to remain relatively low. Passengers in moving vehicles, however, have greater opportunities for off-road views of a project than do drivers. The New England Region has a relatively low amount of commuter and urban traffic although the Calais POE is one of the top ten busiest POEs on the northern border (see Traffic and Roadways, Section 7.16.2).

Local Residents

These individuals may view the proposed actions from stationary locations, such as yards and homes, and while driving along local roads. The sensitivity of residents to visual quality varies and may be tempered by a viewer's exposure to existing CBP actions and infrastructure and other visually varied features already in existence. Presumably, most residents will be highly sensitive to changes in the landscape viewable from their homes and neighborhoods. CBP also considers visual impacts to Native American sacred sites or trust resources before carrying out a project.

Business Employees

These individuals work at local businesses, primarily in the commercial portions of the study area. Business employees will generally experience limited views of the alternative actions except at road crossings while driving to work or where CBP's infrastructure and activity occurs near their place of employment. Most business employees work in one and two-story structures that may or may not have outside views. Those with views often look out on numerous (often varied) built features and the employees within are focused on their jobs. For these reasons, business employees are not likely to be sensitive to landscape changes.

Recreational Users

This group generally includes local residents and tourists involved in outdoor recreation at local parks, recreational facilities, and natural areas: hikers, bicyclists, joggers, and those involved in more passive activities (e.g., picnicking, walking, and nature observation). Scenery and visual quality may or may not be an important part of the recreational experience for these viewers. In general, recreational enjoyment is almost always enhanced by a setting that has not been visually

degraded. For some recreational users, scenery may constitute a very important part of their experience, and their activities may afford continuous views of landscape features over relatively long periods of time. Such viewers are likely to have a high appreciation for visual quality and high sensitivity to visual change.

Given the amount of public land (which includes recreational and conservation lands) in the New England Region, recreational users do not represent a large viewer group compared with western states. Certain recreational users within the study area, however, already have clear views of current CBP infrastructure and activities. Proximity to existing infrastructure and activity may decrease their expectations of visual quality and their sensitivity to visual change.

7.10 SOCIOECONOMIC RESOURCES

7.10.1 INTRODUCTION

This section provides a socioeconomic profile of the New England Region and discusses potential impacts of the CBP's program alternatives on the region's resources. The study area includes areas in the United States and Canada within 100 miles of the border. Some categories of socioeconomic impacts, as discussed in the environmental consequences section, are as likely to be experienced on the Canadian side of the border as on the U.S. side. For example, time delays at border crossings may affect populations and businesses on both sides of the border. In addition, much of the economic activity in U.S. border regions involves cross-border movement of people and goods; therefore, the impacts of CBP activities on Canadian socioeconomic resources are considered along with the impacts on U.S. resources. The impacts of CBP actions on communities and regional economies in Canada are most likely to be felt closest to the border. But since it is not possible to delineate precisely how far from the border impacts may extend, information on the area 100 miles north of the border is provided to mirror the study area in the United States. This definition of the study area does not imply that impacts are necessarily equivalent in the two countries.

Much of the economic data presented here for Canada is not available below the provincial level, so the provinces provide the best available representation of the border region. This limitation does not necessarily suggest the scope of economic impacts; it merely reflects the level at which demographic and economic data are available. All monetary values are expressed in 2009 U.S. dollars, unless otherwise indicated. The socioeconomic environment includes people and their communities, taking into account such things as population movement, density, and age distribution, as well as economic considerations including, income levels, opportunities for employment, and overall economic trends. Section 7.10.2 of this chapter first provides an overview of the socioeconomic resources across the New England Region and north of this region in Canada. It then provides a more detailed characterization of the regional demography, including population levels and distribution, regional growth trends, income, employment levels, poverty statistics, and property values. This section also profiles the regional economy, indexing important economic sectors in terms of income and employment. It further provides regionally focused information on important economic sectors for two POE sites. These sites include those POEs that are most active in terms of the annual number of crossings and the value of cargo transported.

7.10.2 AFFECTED ENVIRONMENT

7.10.2.1 Regional Demographics

To provide context for the potential impacts of CBP actions, some basic, descriptive, socioeconomic information is provided for the New England Region and the area north of this region in Canada and is compared to the broader states, provinces, and national economies, where possible. While the profiled region is defined as the area both 100 miles north and south of the U.S.-Canada border, the statistics in the various tables and text within this section include data for all U.S. counties and Canadian census divisions overlapping these 100-mile regions. These areas represent the finest geographic resolution available for these data and are used, therefore, to approximate values for populations and other demographic variables.

7.10.2.2 Population and Growth Trends

In the United States, approximately 2.2 million people reside in the New England Region (Table 7.10-1). The segment of the population living in border communities accounts for 67.5 percent of the population in the New England Region states of Maine, New Hampshire, and Vermont. Maine has the largest population in the region with about 1.2 million people. The border communities in New Hampshire and Vermont are less populated.

Between 2000 and 2009, border communities in Maine (3.2 percent growth), New Hampshire (6.7 percent), and Vermont (2.5 percent) experienced population growth at a slower pace than the United States as a whole (8.7 percent) (Figure 7.10-1).

Table 7.10-1. Population of the New England Region*

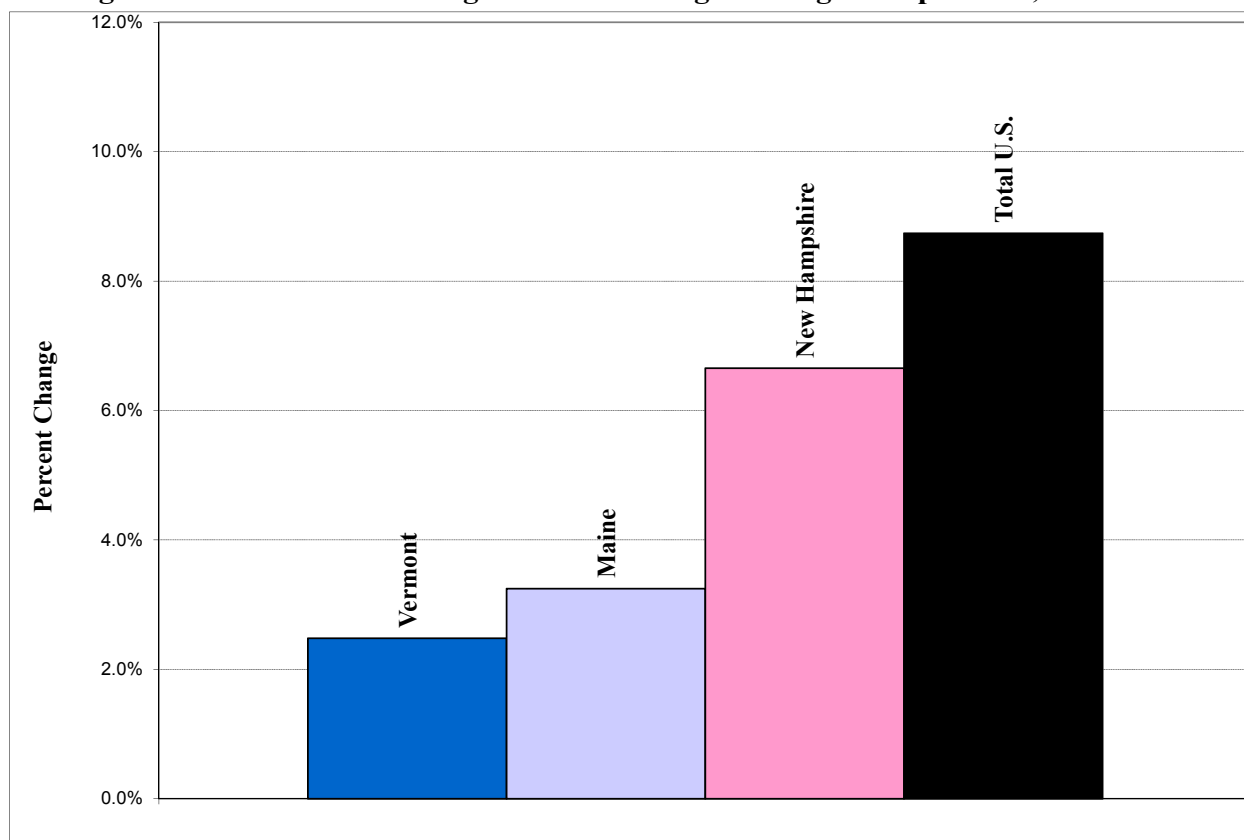
Border State	Population within the Border Area**	Population Overall	Percent of Population within the Border Area
Maine	1,242,924	1,318,301	94.3
New Hampshire	418,759	1,324,575	31.6
Vermont	541,878	621,760	87.2
New England Region Total	2,203,561	3,264,636	67.5
Total United States	28,412,077	310,973,729	9.1

* The American Community Survey provides estimates of demographic, social, economic, and housing characteristics every year for all states, as well as for all cities, counties, metropolitan areas, and population groups of 65,000 people or more (USDOC, 2000).

** Statistics in this column account only for those portions of the states within the New England Region. Total United States accounts only for the border area of all four regions.

While border POEs and BPS along the northern border tend to be in rural, less densely populated areas outside of major metropolitan areas, the majority of the population in the region lives in larger population centers. Population centers in this report include all of the counties that overlap a metropolitan statistical area (MSA), defined by the Office of Management and Budget and used by the USCB to report demographic statistics. Overall, for the New England Region in the United States, approximately 55.1 percent of the population lives in population centers (Table 7.10-2).

Figure 7.10-1. Percent Change in the New England Region Population, 2000–2009



Source: (USDOC, 2009a).

Table 7.10-2. Population Centers in the New England Region*

Border State	Population Center	State's New England Population Living in Population Centers**	Total State Population in the New England Region	Percent of State's New England Population Living in Population Centers
Maine	Bangor	241,153	1,242,924	19.4
	Lewiston-Auburn	106,539		8.6
	Portland-South Portland	536,679		43.2
	Maine State Total	884,371		71.2
New Hampshire***	New Hampshire State Total	0	418,759	0.0
Vermont***	Burlington-South Burlington	329,469	541,878	60.8
New England Region Total		1,213,840	2,203,561	55.1
Total United States****		261,110,826	310,973,729	84.0

* The American Community Survey provides estimates of demographic, social, economic, and housing characteristics every year for all states, as well as for all cities, counties, metropolitan areas, and population groups of 65,000 people or more.

** Statistics in this column account only for those portions of the New England Region within each state.

*** The New England Region in Vermont includes only one population center; thus, no state total row is presented. The New England Region in New Hampshire does not include any population centers.

**** Population statistics in this row represent the proportion of the total American population that resides in population centers across the whole country.

In Canada, approximately 7.4 million people reside in the study area north of the New England Region (Table 7.10-3). Most of Canada's major cities are in the southern part of the country; therefore, the country's population is more heavily concentrated along the border than the U.S. population. For example, in Quebec, approximately 92.7 percent of the population lives in border communities. Quebec has the second largest population living in border communities in Canada. As some census divisions overlapping the 100-mile buffer area are large and extend well beyond 100 miles from the border, this analysis may overstate the Canadian population residing in the study area north of the New England Region.

Between 1996 and 2006, the population of Canada grew 9.5 percent. More recently, according to Statistics Canada, about two-thirds of Canada's growth between 2009 and 2010 was attributable to net international migration. The number of immigrants to Canada rose from 245,300 between 2008 and 2009 to 270,500 between 2009 and 2010. During the economic recession in 2009 and 2010, however, the net flow of non-permanent residents decreased, with more immigrants leaving the country, resulting in lower net international migration in 2010 compared to the previous year. Overall, the area north of the New England Region experienced population growth. Unlike Nova Scotia (-5.1 percent) and New Brunswick (-2.8 percent),

Quebec (6.6 percent) experienced positive population growth, but at a pace slower than Canada as a whole (Figure 7.10-2).

Approximately 71.7 percent of the Canadian population in the study area north of the New England Region resides within population centers (Table 7.10-4). While more than 73 percent of the study area population in Quebec lives in population centers, none of the study area population in Nova Scotia does.

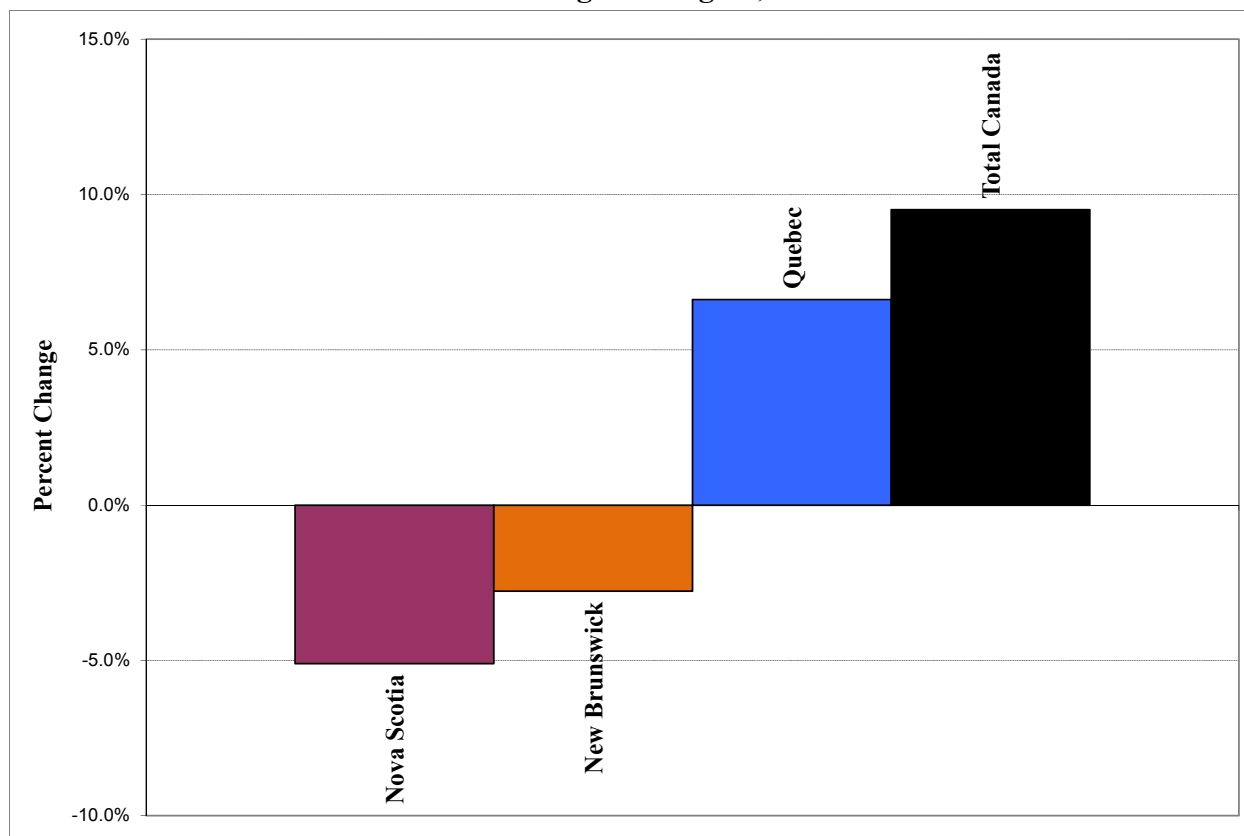
Table 7.10-3. Population North of the New England Region in Canada

Border Province	Study Area Population North of the New England Region*	Total Population in the Province	Percent of Total Province Population Residing in the Study Area North of the New England Region
New Brunswick	453,605	719,650	63.0
Nova Scotia	65,725	903,090	7.3
Quebec	6,895,455	7,435,900	92.7
New England Region Total	7,414,785	9,058,640	81.9
Total Canada	25,562,910	31,241,030	81.8

* Statistics in this column account only for those portions of the provinces within the study area. Total Canada accounts only for those portions of the border provinces within the study area across all four regions.

Source: (StatCan, 2006a).

**Figure 7.10-2. Percent Change in Canadian Population,
North of New England Region, 1996–2006**



Sources: (StatCan, 1996; StatCan, 2006a).

Table 7.10-4. Population in Census Metropolitan Areas in Study Area North of the New England Region in Canada

Border Province	Population Center	Study Area Population Living in Population Centers North of the New England Region*	Total Study Area Population North of the New England Region*	Percent of Total Study Area Population North of the New England Region Living in Population Centers
New Brunswick	Moncton	124,055	453,605	27.3
	Saint John	120,875		26.6
	New Brunswick Province Total	244,930		54.0
Nova Scotia	Nova Scotia Province Total	0	65,725	0.0
Quebec	Montreal	3,588,520	6,895,455	52.0
	Ottawa-Gatineau **	304,985		4.4
	Quebec	704,185		10.2
	Saguenay	149,600		2.2
	Sherbrooke	183,635		2.7
	Trois-Rivières	138,560		2.0
	Quebec Province Total	5,069,485		73.5
New England Region Total		5,314,415	7,414,785	71.7
Total Canada**		21,508,575	31,241,030	68.8

* Population statistics in these columns account only for those portions of the CMAs and provinces within the study area.

** Population statistics in this row represent the proportion of the total Canadian population that resides in population centers across the whole country.

Source: (StatCan, 2006a).

7.10.2.3 Income, Poverty, and Unemployment

The median household income of border communities within the New England Region (\$50,069) is lower than the national average (\$53,051). Border communities in New Hampshire are less wealthy than the state average (Manchester and Concord are outside of the study area).

The poverty rate is defined as the number of individuals included in the poverty count as a percentage of the population for whom the poverty status is determined. The poverty rates for the New England states are all lower than the 12.4 percent for the entire United States (Table 7.10-5). Border communities in New Hampshire and Vermont have the lowest poverty rates of all border communities across the U.S.-Canada border.

The unemployment rates in the New England states in 2009 were all significantly lower than the 9.3 percent for the country (Table 7.10-6). The unemployment rate for border communities in New Hampshire was much lower than the national average.

Table 7.10-5. Income and Poverty Statistics for the New England Region

Border State/ New England Region*		Median Household Income** (\$)	Population Below the Poverty Line***	Percent of Population Below the Poverty Line
Maine	New England Region	47,503	128,261	11.0
	Statewide	47,046	135,501	10.9
New Hampshire	New England Region	54,887	27,542	7.3
	Statewide	62,492	78,530	6.5
Vermont	New England Region	52,338	47,880	9.4
	Statewide	51,614	55,506	9.4
New England Region Total	New England Region	50,069	203,683	9.9
	Selected States	54,056	269,537	8.9
Total United States		53,051	33,899,812	12.4

* Statistics in the non-shaded rows account only for portions of the states within the New England Region.

** Median household income is reported in inflation-adjusted 2009 dollars.

***To determine the poverty rate in the United States, the Census Bureau references income thresholds that vary by family size and ages of family members. If a family's total income, not including noncash benefits (such as food stamps and housing subsidies), is below the family's threshold, every individual in the family is included in the poverty count.

Source: (USDOC, 2000a; USDOC, 2000b).

Table 7.10-6. Unemployment Rates for the New England Region

Border State/ New England Region*		Unemployment Rate (%)
Maine	New England Region	8.1
	Statewide	8.0
New Hampshire	New England Region	5.9
	Statewide	6.3
Vermont	New England Region	6.9
	Statewide	6.9

Border State/ New England Region*		Unemployment Rate (%)
New England Region Total	New England Region	7.3
	Selected States	7.1
Total United States		9.3

* Statistics in the non-shaded rows account only for portions of the states within the New England Region.

Source: (USDOL, 2009a).

The median household income in the study area north of the New England Region is approximately \$43,700 (in 2009 U.S. dollars) compared with \$49,400 for Canada as a whole (Table 7.10-7). Border communities in New Brunswick and Nova Scotia have the lowest poverty rates among all border communities north of the U.S.-Canada border.

The poverty rate in Canadian communities is defined as the percentage of low-income “economic families.” (See note in Table 7.10-7 for an explanation of “economic family.”) This threshold-based designation is comparable to the poverty statistics reported in the USCB. In the study area north of the New England Region, the poverty rate is approximately 12.5 percent compared with 11.6 percent for Canada as a whole (Table 7.10-7). Border communities in Quebec have the second highest poverty rates among all border communities north of the U.S.-Canada border.

In the study area north of the New England Region, the unemployment rate was 6.9 percent in 2006 compared with 6.6 percent for Canada (Table 7.10-8). In Nova Scotia, the unemployment rate was significantly higher in the border communities than for the entire province. Border communities in New Brunswick and Nova Scotia have the highest unemployment rates among all border communities north of the U.S.-Canada border.

Table 7.10-7. Income and Poverty Statistics North of the New England Region in Canada

Border Province/Study Area North of New England Region*		Median Household Income** (\$US)	Number of Low-Income Economic Families***	Percent of Low-Income Economic Families***
New Brunswick	Study area north of New England Region	42,435	14,293	10.7
	Province	41,620	22,252	10.4
Nova Scotia	Study area north of New England Region	36,138	2,063	10.3
	Province	42,920	27,192	10.3
Quebec	Study area north of New England Region	43,846	248,722	12.6
	Province	42,748	260,440	12.3
New England Region		43,692	265,078	12.5
Study area north of New				

Border Province/Study Area North of New England Region*		Median Household Income** (\$US)	Number of Low-Income Economic Families***	Percent of Low-Income Economic Families***
Total	England Region			
	Selected provinces	42,676	309,884	11.9
Total Canada		49,393	1,006,911	11.6

* Statistics in the non-shaded rows account only for portions of the provinces within the study area.

** Median household income is reported in inflation-adjusted 2009 US dollars.

*** The Canadian Census reports statistics for “low-income” economic families. This threshold-based designation is comparable to the poverty statistics reported in the USCB. The term “economic family” refers to a group of two or more persons who live in the same dwelling and are related to each other by blood, marriage, common-law, or adoption. A couple may be of opposite or same sex. Foster children are included.

Source: (StatCan, 2006d).

Table 7.10-8. Unemployment Rates North of the New England Region in Canada

Border Province/Study Area North of the New England Region*		Unemployment Rate (%)
New Brunswick	Study area north of New England Region	10.1
	Province	10.0
Nova Scotia	Study area north of New England Region	11.8
	Province	9.1
Quebec	Study area north of New England Region	6.6
	Province	7.0
New England Region Total	Study area north of New England Region	6.9
	Selected provinces	7.4
Total Canada		6.6

* Statistics in the non-shaded rows account only for portions of the provinces within the study area.

Source: (StatCan, 2006c).

7.10.2.4 Property Values

In the New England Region, the median property value between 2006 and 2008 was approximately \$192,400—the same median property value for the United States as a whole (\$192,400) (Table 7.10-9). Except for New Hampshire, the median property value within the border region is higher than the median property value for each respective state.

Table 7.10-9. Median Property Value for the New England Region

Border State/ New England Region*		Median Home Value** (\$)
Maine	New England Region	177,700
	Statewide	175,200
New Hampshire	New England Region	220,100
	Statewide	260,300
Vermont	New England Region	205,300
	Statewide	203,800
New England Region Total	New England Region	192,400
	Selected states	214,500
Total United States		192,400

* Statistics in the non-shaded rows account only for those portions of the states within the New England Region.

** The American Community Survey provides estimates of housing characteristics for all geographic areas with populations of 20,000 or more, including the Nation, all states and the District of Columbia, all congressional districts, and approximately 1,800 counties every 3 years. Due to the use of value categories rather than specific amounts collected for each individual housing unit in 2006 and 2007, property values cannot be inflation adjusted. Property values are reported in nominal dollar terms.

Source: (USDOC, 2008a).

In the study area north of the New England Region, the median property value in 2006 was approximately \$173,800 (in 2009 U.S. dollars) compared with \$232,200 for Canada as a whole (Table 7.10-10). Border communities in New Brunswick have the lowest median property values among all border communities north of the border. The median property value for border communities in Nova Scotia is significantly less than for the province as a whole.

Table 7.10-10. Median Property Value North of New England Region in Canada

Border Province/Study Area North of New England Region*		Average Value of Dwelling** (\$US)
New Brunswick	Study area north of New England Region	107,900
	Province	105,400
Nova Scotia	Study area north of New England Region	116,500
	Province	139,300
Quebec	Study area north of New England Region	178,700
	Province	160,800
New England Region Total	Study area north of New England Region	173,800
	Selected provinces	154,300
Total Canada		232,200

* Statistics in the non-shaded rows account only for those portions of the provinces within the study area.

** A dwelling is defined as a set of living quarters designed for or converted for human habitation in which a person or group of persons reside or could reside. In addition, a private dwelling must have a source of heat or power and must be an enclosed space that provides shelter from the elements, as evidenced by complete and enclosed walls and roof and by doors and windows that protect from wind, rain, and snow. Property values are reported in 2006 U.S. dollars.

Source: (StatCan, 2006b).

7.10.2.5 Regional Economies

Tourism is a major component of economic activity along the northern border. Canada is the top country of origin for visitors to the United States. In 2008, the number of Canadian visitors staying one or more nights in the United States was nearly 19 million (USDOC, 2008d). In this context, “Canadian visitors” refers to Canadian residents visiting the United States.

Crossing the northern border using surface modes of transportation is the principal means of entry for Canadians

Trade with Canada

The flow of goods, services, and people across the border contributes significantly to economic activity in border communities. Canada is the largest trading partner of the United States. In 2009, the total value of merchandise trade with Canada was approximately \$429.6 billion—\$204.7 billion in exports and \$224.9 billion in imports. Shipments by surface modes of transportation, excluding pipelines, account for approximately 79 percent of total merchandise trade with Canada. The top exports to Canada by surface transportation are automobiles and automotive parts and accessories, and other machinery, appliances, and equipment. The top imports from Canada are automobiles and automotive parts and accessories, other machinery and appliances, and processed paper and pulp products. On average, approximately \$930 million in merchandise crosses the northern border by surface transportation every day (USDOT, 2009a). Appendix Q of this analysis provides trade statistics for surface transportation between the United States and Canada.

visiting the United States, accounting for two-thirds (12.6 million) of all Canadian visitor entries (USDOC, 2008b). While approximately 16 percent of Canadian visitors entering the United States by surface transportation visited the New England Region, spending in this region accounted for a relatively low percentage (less than 7 percent) of these visitors' total spending in the United States. Canadian visitors entering by surface transportation contributed approximately \$535 million to the New England Region in 2008 (Table 7.10-11). The average visitor spent approximately \$262 per visit. The most common stated purposes for visiting states in the region were vacation (82 percent), visiting friends or relatives (15 percent), and business or employment (3 percent). The New England Region had the lowest percentage of travel due to business or employment. While business travelers tend to spend more per trip, they rely more heavily on air travel and travel further from the border.

Table 7.10-11. Canadian Visitors Entering the New England Region by Surface Transportation*

Destination	Visitors		Spending			Purpose of Trip		
	Number of Visitors (000s)	Average Nights Per Visit	Visitor Spending (\$US millions)	Spending per Visitor (\$US)	Average Daily Spending per Visitor (\$US)	Business, Convention, or Employment (%)	Visiting Friends or Relatives (%)	Holiday, Vacation, or Other (%)
Maine	857	3.4	261.2	305	91	2.8	13.2	84.0
New Hampshire	443	2.9	110.5	249	87	3.0	15.6	81.6
Vermont	741	3.1	163.7	221	72	2.9	15.7	81.5
Border States in New England Region	2,041	3.2	535.0	262	82	2.9	14.6	82.6

* Surface modes of transportation include autos, buses, and other non-air modes of transportation. Average nights per visit and average daily spending per visitor are based on total visitors, including air travelers.

Sources: (USDOC, 2008a; USDOC, 2008b; USDOC, 2008c).

7.10.2.6 Economic Profiles of POEs and BPSs in the New England Region

This section provides regional economic profiles for border communities in the United States and Canada that surround selected POEs in the New England Region. This section characterizes socioeconomic resources of specific border communities in the region to provide context for the discussion of potential consequences of CBP's alternative actions, and to highlight the diversity in regional economies surrounding POEs and BPSs along the northern border. Appendix Q of this report provides data on trade, employment, and payroll statistics by economic sector for U.S. counties and Canadian provinces that contain profiled POEs and BPSs in the four northern border regions.

This section profiles two sites in the New England Region representing the most heavily used POEs along the U.S.-Canada border in the region in terms of total crossings and the total value of trade. Table 7.10-12 lists the sites ranked by crossing volume and provides information on associated crossing activity.

Table 7.10-12. POE and BPS Sites Profiled in the New England Region

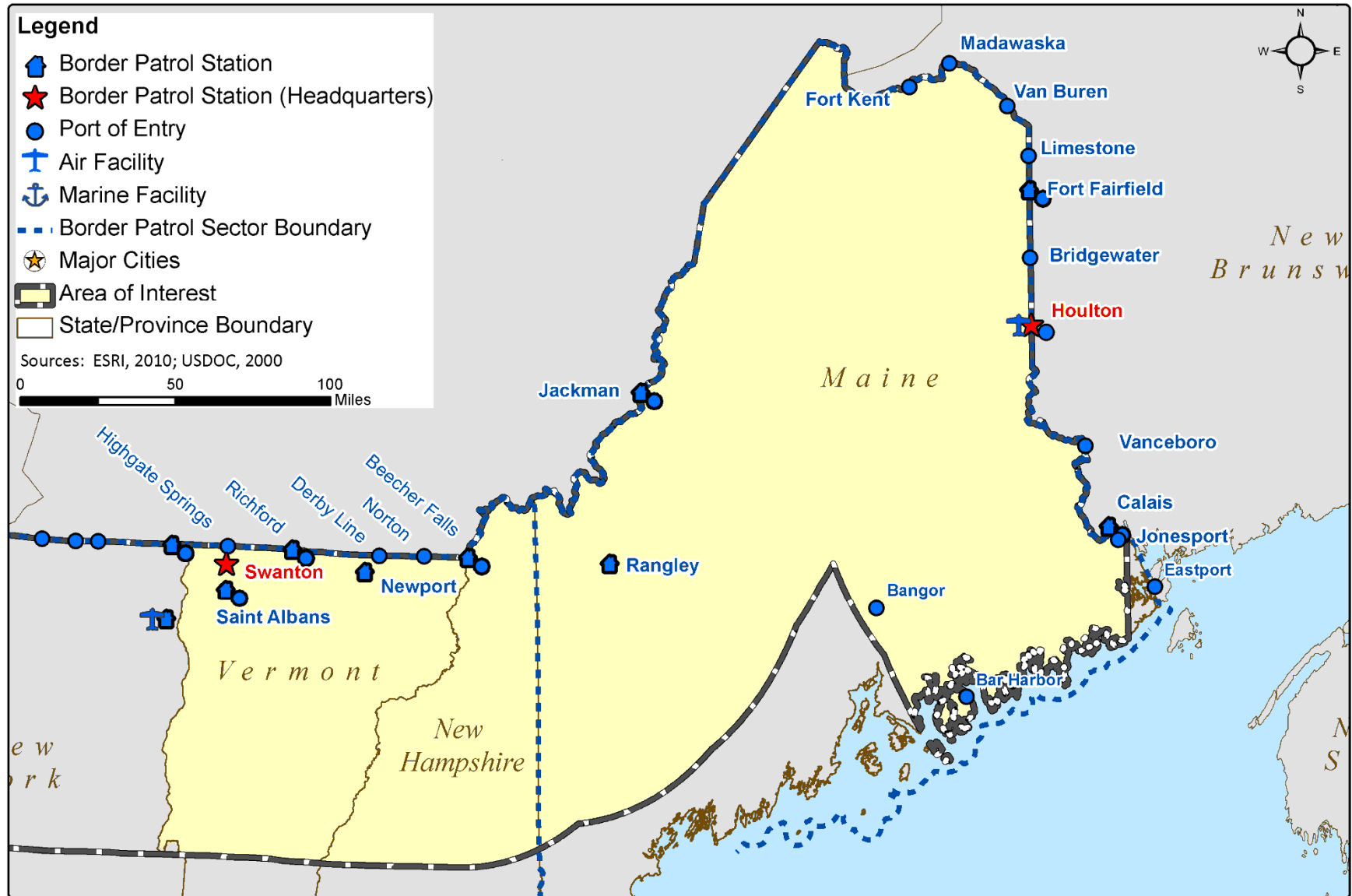
Port	Annual Individual Crossings (% of Total)	Annual Vehicle Crossings (% of Total)	National Rank by Crossing Volume	Annual Trade Value (Surface Mode)	Rank by Trade Value	Two Largest Commodities (% of Port's Trade Value)	Important Features
ME: Calais	1,414,000 (2.3%)	963,530 (3.0%)	10	\$2,360,785,936 (0.7%)	14	<ul style="list-style-type: none"> Fish and crustaceans, mollusks (30.9%) Nuclear reactors, boilers, machinery, and mechanical appliances (7.9%) 	<ul style="list-style-type: none"> Close community ties between Calais, ME and St. Stephen, New Brunswick
VT: Derby Line	1,355,812 (2.2%)	650,320 (2.0%)	11	\$1,707,808,810 (0.5%)	17	<ul style="list-style-type: none"> Paper and paperboard (16.5%) Wood and articles thereof (14.4%) 	<ul style="list-style-type: none"> Heavy summer travel use

* Size based on number of individual border crossings.

** BTS does not provide data on commodities and crossings at BPSs.

Sources: IEc analysis of Bureau of Transportation Statistics data: (USDOT, 2009a; USDOT, 2009b; USDOT, 2009c).

Figure 7.10-3. Locations of POEs and BPSs in the New England Region



The remainder of this section characterizes the regional economies of the U.S. counties and Canadian provinces containing the New England Region sites identified in Table 7.10-12 and Figure 7.10-3.

Orleans County, Vermont

Orleans County, Vermont lies between the eastern and western ranges of the Green Mountains and is bordered by Quebec to the north. This county is largely rural and has a population of approximately 28,000. The border splits the towns of Derby Line, Vermont, and Stanstead, Quebec, but the two towns function as a single community, sharing resources such as a sewer system, emergency services, snowplows, and the Haskell Free Library and Opera House (NYT, 2009). The Jay Peak Resort and surrounding area is a popular ski destination just five miles south of the border. Outdoor winter recreational activities, including skiing, snowboarding, cross-country skiing, snowshoeing, snowmobiling, and hiking are popular in the area. The major economic sectors by annual payroll are health care and social assistance (\$56.2 million), retail trade (\$33.0 million), construction (\$23.3 million), and accommodation and food services (\$13.4 million). The poverty rate for Orleans County is the second highest in Vermont and the median household income is the second lowest in the state.

- **Derby Line POE:** The Derby Line POE has two crossing points leading to either Route 55 or Route 143 in Quebec. Derby Line is approximately 220 miles north of Boston on Interstate 91 and approximately 100 miles southeast of Montreal. Two popular winter destinations for Canadians are the Jay Peak Resort and the White Mountain National Forest in New Hampshire. Monthly crossing data show an annual surge in privately owned vehicle crossings in July and August, suggesting that tourists use this POE heavily for summer travel (USDOT, 2009c). Derby Line has the eleventh highest volume of individual border crossings, accounting for 1.4 million or 2.2 percent of all U.S.-Canada crossings in 2009. The value of border commerce at the Derby Line POE in 2009 was \$1.7 billion (approximately 0.5 percent of all U.S.-Canada trade). Derby Line is a significant freight crossing for the paper and wood product industries. The major commodities transported across Derby Line by trade value are paper and paperboard (16.5 percent), wood and wood articles (14.4 percent), vehicles and parts (8.0 percent), and articles of iron or steel (7.4 percent).

Washington County, Maine

Washington County, Maine is the easternmost county in the United States. This county is largely rural and has a population of approximately 32,000. It has many fishing-based, seaside communities; it also has an agricultural economy for which a key component is wild blueberry production. Maine is the single largest producer of wild blueberries in the world. According to the U.S. Department of Agriculture, Maine produced 89.95 million pounds of wild blueberries in 2008 (USDA, 2009). The major economic sectors in Washington County by annual payroll are health care and social assistance (\$62.9 million), manufacturing (\$39.4 million), and retail trade (\$23.9 million).

Many Canadians travel through Washington County to reach Bangor International Airport or shop at Bangor Mall. Bangor, the state's third largest city, is the economic center for central, northern, and Down East Maine and serves as northern New England's economic link to the Canadian maritime, eastern Quebec, and beyond (CBME, 2010). However, Washington County

is relatively less affluent. According to the USCB, it has the lowest median household income and the highest poverty rate in the state.

The border between Washington County and New Brunswick splits some communities. Residents of Calais in Maine and St. Stephen in New Brunswick have close ties; it is common to have family that lives across the border (USDHS, 2008). Calais and St. Stephen frequently function as a single community, fostering cooperation between the fire departments and on other projects. Calais does not have a football field, so its high school team plays its games in St. Stephen. This unique relationship is celebrated yearly during the International Homecoming Festival. In November 2009, a new border crossing opened between the two towns (Mack, 2009).

- Calais POE: The Calais POE is separated from St. Stephen, New Brunswick by the St. Croix River. The POE is approximately 100 miles northeast of Bangor. There are two distinct border-crossing points at the Calais POE: the Ferry Point Bridge and the Milltown Bridge. The close ties among communities split by the border are reflected in the substantial number of pedestrian crossings. Calais ranks third among all U.S.-Canada POEs in the number of pedestrian crossings with 16,665 pedestrian crossings in 2009, behind Sumas and Buffalo-Niagara Falls. The number of pedestrian crossings may be underestimated because at the Ferry Point Bridge, privately owned vehicles can obscure the view of guards so that pedestrians remain uncounted (USDOT, 2001). Calais has the tenth highest volume of individual crossings overall, accounting for 1.4 million or 2.3 percent of all U.S.-Canada crossings in 2009. A relatively small number of buses use the Calais POE and there are no passenger trains. Calais accounts for the fourteenth highest value of trade with \$2.4 billion or 0.7 percent of all U.S.-Canada trade in 2009. As the largest land POE along the Eastern seaboard, it is the single largest POE for shipment of fish, crustaceans, mollusks, and other aquatic invertebrates, which accounted for \$730.3 million or 30.9 percent of U.S.-Canada trade in seafood. The other major commodities transported through Calais include machinery and mechanical appliances (7.9 percent), paper and paperboard (7.6 percent), and rubber and articles thereof (7.0 percent).

Quebec, Canada

Quebec lies to the north of the Derby Line POE. Quebec sits in eastern central Canada and shares an international border with the states of New York, Vermont, New Hampshire, and Maine. Quebec is the second largest Canadian province, accounting for 24 percent of the entire population. Most of the population lives on either shore of the St. Lawrence River between Montreal and Quebec City. Half of Quebec's population lives inside the Montreal metropolitan area. French is the native language for 80 percent of the population. Montreal is a major tourist destination due to its rich history, distinct heritage, and culture. The International Jazz Festival and the Montreal Casino attract many visitors. In the winter, tourists travel to Quebec to enjoy the numerous ski resorts. Mont-Tremblant, 150 km north of Montreal, is one of the most popular resorts for American tourists. Quebec City, the capital of Quebec, is the second largest urban center. During the international Winter Carnival, Quebec City also hosts a great number of visitors.

Quebec is home to a number of high-tech industries, including aerospace companies and the Canadian Space Agency, and a large public sector. Montreal is a center of commerce, industry,

technology, culture, and finance, while the economy of Quebec City is dominated by public administration and government services. The dominant economic sectors in Quebec by annual payroll are manufacturing (\$23.4 billion), health care and social assistance (\$14.0 billion), professional, scientific, and technical services (\$11.6 billion), and public administration (\$11.2 billion). A significant paper and pulp products industry exists outside the major urban centers. The lumber industry is the economic cornerstone for nearly 250 of Quebec's municipalities and generates approximately 40,500 direct jobs (QFIC, 2010). Quebec is also an important agricultural producer. It is the largest dairy producer in Canada and produces nearly 75 percent of the world's maple syrup.

New Brunswick, Canada

New Brunswick lies to the north of the Calais POE. New Brunswick is one of three Canadian Maritimes Provinces and has the smallest land area and population in the Canadian study area. New Brunswick's three major cities are Moncton, St. John, and Fredericton. Moncton is the most populous city in New Brunswick and is the commercial and retail center of the province. The city of St. John, along the north shore of the Bay of Fundy, is the second largest city and the major industrial center of the province. The Irving Group, which has interests in oil, forestry, shipbuilding, and transportation, is headquartered in St. John and is the largest employer in the province (JDI, 2010). The Port of St. John, the largest seaport in New Brunswick, handles an average of 27 million metric tons of cargo annually and is one of Canada's key ports recognized for its strategic importance to Canada's trade and economy (SJPA, 2010). It is also a major port for cruise ships traveling between Canada and New England. Fredericton, the capital of New Brunswick, is the center of government services and higher education.

The major economic sectors in New Brunswick by regional income are manufacturing (\$1.6 billion), health care and social assistance (\$1.4 billion), public administration (\$1.3 billion), retail trade (\$940.7 million), and educational services (\$936.5 million). Outside of the urban centers, the economy centers on farming, forestry, and fishing. The tourism industry is supported by cruise ships entering the Port of St. John and by Fundy National Park, a major tourist attraction.

7.11 CULTURAL AND PALEONTOLOGICAL RESOURCES

7.11.1 INTRODUCTION

This section provides an overview of cultural and paleontological resources located in the New England Region of the northern border and discusses potential impacts of CBP's program alternatives on those resources.

7.11.2 AFFECTED ENVIRONMENT

7.11.2.1 Archaeological Resources: Prehistoric/Precontact Context

Among the known cultural resources in the New England Region are archaeological sites from the prehistoric and pre-European contact periods. This section provides an overview of those periods. An expanded prehistoric and pre-European contact-period context and references can be found in Appendix H. In North America, the Prehistoric/Precontact era is generally divided into three broad periods: Paleo-Indian, Archaic, and Ceramic/Woodland/Late. During the Prehistoric era, North-American groups evolved from highly nomadic big-game hunters to politically sophisticated and sedentary Tribes and nations employing large-scale agriculture. There are thousands of known archaeological sites within the New England Region, which represent a fraction of the potential sites that may exist in the region. This record of known sites has been built up over the years as a result of reports by amateurs and vocational archaeologists as well as the result of formal archaeological surveys conducted by professionals and academics. In parallel with the evolution of prehistoric groups from nomadic hunting to sedentary agriculture/aquaculture and the resulting increases in population, sites from the earlier periods (ca. 12,000 to ca. 7,000 years before present [B.P.]) are rare. Sites from the later periods account for the bulk of the known sites in the region.

Paleo-Indian Period

The Paleo-Indian period (ca. 12,000 to ca. 10,000 B.P.) is similar in much of the study area and was characterized by people inhabiting the recently deglaciated environment. Subsistence was dominated by big-game hunting of mastodon, mammoth, caribou, horse, bison, musk-ox, giant ground sloth, white-tailed deer, elk, moose, and wapiti, along with species of smaller mammals, birds, fish, reptiles, and shellfish. These early hunting groups generally had highly mobile lifeways. There are several types of Paleo-Indian sites including small camps; workshops/quarries; kill sites; rockshelters/cave camps; major, recurrently occupied camps; and possible cremation sites.

Archaic Period

During the Archaic period (ca. 10,000 to ca. 3,000 B.P.), the environment changed from unstable post-glacial conditions to an essentially modern state. In the context of this changing landscape, came numerous cultural and technological changes. People gradually adopted less-mobile lifestyles. At the same time, they broadened the variety of resources on which they depended for food and shelter. Some groups began regularly interacting and trading with other people across large distances—sometimes over a thousand miles away. There are relatively few sites from the first 3,000 years of the Archaic known in the northern portion of the United States, a fact probably related to the continually changing climate and environment. Sites from the last 4,000 years of the period are more common and show people had developed a great variety of tool

types and styles, mostly made from stone, bone, and wood. In general, Archaic sites are found along water and on lake plains.

Woodland/Ceramic/Late Period

The Woodland/Ceramic/Late period lasted from 3,000 B.P. to the time when European trade goods reached Indian groups (450 to 250 B.P.). During this time, people invented several new technologies, including clay pots and the bow and arrow. Long-distance trade intensified. Groups adopted agriculture, developed even less-mobile lifeways than before, and started living in larger settlements, some with over 1,000 inhabitants. In the millennium before contact with Europeans, many people in the eastern half of the United States came to rely heavily on maize, beans, and squash and started living in large villages that had defensive walls and were located in easily-defendable locations, such as elevated terrain near rivers.

7.11.2.2 Prehistoric Archaeological Site Probability

Archaeologists use a variety of information and techniques to carry out *predictive modeling*, the process of assessing the probability of the existence of archaeological sites in a given location. This section provides an overview of the current understanding of archaeological site probability in the New England Region.

Maine

The Maine Historic Preservation Commission (MHPC) identifies five types of Precontact archaeological sites: (1) habitation (camp or village) and workshop sites; (2) lithic quarries; (3) cemeteries; (4) rock art; and (5) waterlogged sites preserving wood or other perishables. There are about 6,000 sites in the Maine prehistoric archaeological survey inventory. Habitation and workshop sites comprise the vast majority (over 95 percent) of the known archaeological locations in Maine. They exhibit evidence of a range of activities from food procurement and processing to tool manufacture and maintenance. More than 95 percent of these sites are located adjacent to canoe-navigable waters, whether coast, lake, river, stream, swamp, or relict shorelines. The majority of sites is shallowly buried on till, sand, gravel, or silt soils within 1.5 feet of the surface. In alluvial settings along rivers and streams, sites can be buried more deeply—to depths of 10 feet.

Predictive site-location models are also based partly on culture periods as well as bedrock and surficial geology, proximity to water, aspect, and slope. Elevated sandy bluffs are considered sensitive for the presence of Paleo-Indian and Late Ceramic period sites. Relatively level terraces bordering rivers and streams are sensitive for Late Paleo-Indian, Archaic, and Ceramic period sites. This sensitivity is enhanced by the presence of rapids or confluences. Landforms at the start or end of rapids at stream confluences and with a southern or eastern exposure are particularly likely locations for Native American archaeological sites. The original shores of lakes, particularly at inlets and outlets, are also sensitive for Late Paleo-Indian, Archaic, and Ceramic period sites. Landforms in areas with a high density of known archaeological sites are considered more sensitive than landforms in areas where sites are rare.

New Hampshire and Vermont

Developing a single, scientifically valid, objective, highly operationalized, deductively derived model for locating Precontact period, Native American archaeological sites across Vermont or

New Hampshire would not be feasible because most of the area lacks representative data (Sloma and Callum, 2002). The Vermont State Historic Preservation Office (SHPO) uses one broad predictive model approved by the Vermont Advisory Council on Historic Preservation. The Vermont SHPO's predictive model is intended to identify areas with a high potential for containing significant Precontact Native American residential sites. The model may offer some guidance in locating non-Native early settlement sites and some types of historic-period Native American sites since these types of sites had similar environmental requirements to Precontact settlements. The locations of individual Native American burials, cemeteries, and special-use areas during any time period are not readily predictable and the model is unlikely to help in their identification.

The present information on Precontact period, Native American archaeological sites, such as lithic procurement, caves, ritual, subsistence, and habitation sites, would suggest a diverse variety of Native American sites within the northern border study area from the Paleo-Indian to the present time. These sites have been documented in a wide variety of environmental settings ranging from bedrock, to upland, to small streams, to broad floodplains. Native Americans apparently continuously occupied and utilized this region. New Hampshire sites with the largest area, highest artifact density, and greatest number of occupations are apt to be located in distinctive settings such as major river channels, particularly at falls, river confluences, or rich alluvial bottomlands; the interface of tidal estuaries and fresh water; or the outlets of lakes. In Vermont, sites with the largest area, highest artifact density, and greatest number of occupations are apt to be located in the Champlain Valley bordering Lake Champlain, the Connecticut River Valley, and other major river channels, particularly at falls, river confluences, or rich alluvial bottomlands. Smaller, but no less important, Native American sites may be present beside interior lakes, ponds, wetlands, and springs, as well as near important resource areas such as lithic sources, rock shelters, and mountain passes.

7.11.2.3 Historic Context

This section provides a brief historic context that describes the development of the New England Region after European contact. An expanded historic context and references can be found in Appendix H.

Contact between Indigenous people and Europeans in northern New England began in the mid-to-late sixteenth century from French outposts along the Atlantic coast of Canada. The earliest settlement of Maine was the French colony at St. Croix Island in 1604. While the early French occupations were focused on the fur trade and missionary work, the English settlements in Massachusetts and southern New Hampshire were permanent occupations. Northern Maine remained part of the French cultural sphere until after the Revolutionary War, while southern coastal Maine, New Hampshire, and Vermont were in the English sphere of influence from the beginning of their settlement.

The colonial period, especially before 1700, is characterized by intensive and brutal conflicts between the colonists and the Indians (e.g., King Philip's War [1675-1676]). Later, conflicts pitted the French and English and their Native allies in a series of conflicts for supremacy of the New World—King William's War (1690-1700), Queen Anne's War (1702-1713), the French and Indian War (1754-1763)—and gave rise to military traffic and conflict along Lake Champlain and its waterways in areas of northern Vermont and New York.

Initial occupations in this rugged, heavily timbered region comprised fur trading, logging, and small-scale agriculture. Timbering experienced resurgence in the late-nineteenth century, especially in northern and interior Maine.

During the nineteenth century, development of transportation routes opened the region to settlement. While poor roads kept settlement low until the 1850s, new routes included a variety of highway types, canals, and later railroads, which were heavily concentrated in the southern part of the region. These new routes opened new locations for settlement and provided new opportunities for business. Agriculture in this region was generally poor, but commerce was quick to use the abundant water power for operating a variety of mills. Small-scale textile mills took root in the 1820s and soon spread over the region, expanding into a variety of small, water-powered factories. These factories were complemented by small-scale agriculture, maple-syrup collecting, hop farming, and dairying during the later-nineteenth century through the twentieth century.

These small factories attracted numerous waves of immigrants during their operation but by the mid-twentieth century were dying out. The introduction of the automobile revolutionized settlement patterns and enhanced transportation capabilities. Tourism and recreation are important components of the economy in this region.

7.11.2.4 Historic/Protohistoric Archaeological Site Probability

Among the known cultural resources in the New England Region are archaeological sites from the historic and post-European contact periods. This section provides an overview of the current understanding of historic archaeological site probability in the New England Region. This section includes the Protohistoric Period (defined as the time between the initial arrival of European goods and diseases and actual contact between Native Americans and non-Natives) which extended from about A.D. 1500 to A.D. 1650. Items including guns, ceramics, and other elements of material culture were quickly integrated into indigenous economic and subsistence systems.

The earliest direct contact between Native Americans and Europeans in the Northeast were interactions between groups of coastal Indians and Basque, Portuguese, and Breton fishing parties in the early 1500s. Later, after the arrival of French settlers at what is now Nova Scotia in 1604 and the Pilgrims at Plymouth in what is now Massachusetts in 1620, European involvement in the area intensified. The first fifty years of the contact period in the area primarily involved interaction between Native American groups and non-Native settlers, fur traders, and Christian missionaries.

Maine

Historic non-Native site-sensitivity assessments in Maine are based on an evolving set of guidelines established by the MHPC in which early colonial period sites along the coast are generally given higher priority than sites of later times and contexts. However, the provision for the careful assessment of the first fifty years of settlement in any given township, regardless of time period and the state's recognition of the significance of the region's historic industries, add considerably to the inventory of historic-period archaeological sites in Maine. A working draft of the state's agricultural context and the development of various other contexts, from logging

and lumbering to sporting camps, together with guidelines established by the NPS provide additional means by which historic non-Native sensitivity in Maine is assessed.

The predictive site-location model for historic non-Native sites is in part also based on a set of environmental variables similar to those favorable for Native American site selection, some of which are directly borrowed from Precontact cultural settings, such as the utilization of travel corridors, agricultural fields, and village sites. Use of a wide range of natural resources during the historic period resulted in a large number of known and expected archaeological resources related to rural industries, patterns of town development, and other historic contexts. The archival record aids in the assessment of individual sites and landscapes within the region. Maps and a variety of other documents aid in site identification and interpretation, potentially answering questions concerning function, duration, and significance.

New Hampshire and Vermont

In Vermont, the Division for Historic Preservation (VDHP) highlights significant types of sites in “Keeping Vermont A Special World: The Vermont Historic Preservation Plan.” This ten-year plan summarizes historic contexts that describe what we know about our past according to important themes, types of cultural resources, quantity, and quality. Archaeologists further define significance as a site’s potential to yield important information about the past, despite site size, artifact number, or site notoriety. The NPS maintains a summary website of state historic preservation plans, including those for Vermont and New Hampshire.¹ Both plans are currently under revision.

The State of Vermont promotes the use of its *predictive model*. Draft archaeological guidelines for Vermont (VDHP, 2002) describe the application of the state’s predictive model:

The predictive model is an initial desk-review tool; it is only a coarse filter that may highlight potential site areas. A project area that indicates a high potential for containing a significant site on the predictive model may trigger a site visit. The site visit results in a recommendation for further archaeological investigation, or, results in a “sign off.”

The Vermont SHPO applies the predictive model during desk review of development projects subject to state laws, although developers and state agencies may choose to hire archaeological consultants to apply the predictive model which will then be reviewed by the SHPO. The SHPO usually conducts site visits triggered by the predictive model for Act 250 and state reviews.

Historic-period archaeological sites are likely to vary in location, function, and age between different physiographic regions, watersheds, and the landforms or settings where they were established. In some contexts, there appears to be a correlation between Precontact period Native American sites overlapped by later early historic-period sites (e.g., Doherty et al., 1995; Doherty et al., 1997); these occurrences have yet to be fully explored. Shaffer (1998) discussed this same point in regard to Pennsylvania archaeology.

¹See <http://www.nps.gov/history/hps/pad/stateplans/planlist.html>.

Interest in historic-period archaeological sites is fairly recent in comparison to Precontact period sites. The earliest excavation of a historic-period site in New Hampshire was in Wolfeboro in 1934–1935 when the Civilian Conservation Corps excavated inside the plantation-mansion cellar hole of New Hampshire's last colonial governor, John Wentworth (Starbuck, 1989). Since that time, cultural resource-management work and academic research in Vermont and New Hampshire has added to our knowledge of this later era of human occupation in this region. The information is far from complete, and many sites remain to be identified and investigated.

The general pattern of historic settlement in New Hampshire and Vermont developed largely around river channels and lakes, with floodplain areas often being the easiest areas to develop, and later spreading into upland areas. Settlement pattern studies of historic-period non-Native archaeological sites grew predominately from the field of geography (Glassie, 1968; Hubka, 1984; Meeks, 1986a; Meeks, 1986b; McHenry, 1979; McHenry 1986), local or regional history (e.g., Russell, 1976), or anthropology (e.g., Elliott, 1977).

Today, historic archeologists may examine where settlers located upon the landscape and how they arranged their farmsteads. For example, a constricted, linear (mostly north-south) farmstead layout exists upon Connecticut River Valley terraces and Champlain lowland bedrock ridges settled largely in the late-eighteenth and early nineteenth century by settlers of largely English ancestry. Farmstead layout is likely to be different on deltas, lake bottoms, and perhaps hill farms. Unfortunately, farmstead layout is poorly studied in all but the Connecticut River Valley (Hubka, 1984; McHenry, 1986). McHenry (1986) has shown that eighteenth-century Vermont field patterns even reflect differences among English settlers from Connecticut, Massachusetts, and New Hampshire. Different patterns for “hill farms” have also been found (Melnick et al., 1984). Little archaeological work has been conducted in Vermont and New Hampshire to investigate the historic-period settlement pattern of other ethnic groups including Native Americans, African Americans, Dutch, French, and others.

In a review of New Hampshire's historic-period archeology, Starbuck (1994) pointed to gaps in historic site data. He observed (1) that no archaeological study existed of any minority group in the state; (2) women's activities were poorly represented in archaeological studies; (3) there were almost no comparisons of “coastal” versus “interior” settlement patterns; (4) there had been few efforts to locate early posthole houses and other forms of poorly known architecture, which were holdovers from English medieval styles; and (5) very little was done with the sites of farms and early industries. Since that time, most of these deficiencies have been addressed to some degree, but much work remains to be done.

Known historic-period sites and structures provide some general information as to where one might expect to find archaeological sites of the same age, but not all of these properties are documented. Developing a single, scientifically valid, objective, highly operationalized, deductively derived model for locating historic-period archaeological sites across Vermont and New Hampshire would not be feasible because most of the area lacks representative data (Sloma and Callum, 2002). The ability to model for historic-period site locations and settlement patterns has been demonstrated in several studies (Klein, 1973; Langhorne, 1976; Moran, 1978; Monroe et al., 1980; Paynter, 1982; Mires, 1983; Lewis, 1984; O'Brien, 1984; Hasenstab and Resnick, 1990; Lukezic, 1990; Zubrow, 1990; Linebaugh and Robinson, 1994).

In some instances, a historic-period site may provide the only information when records are non-existent. While most researchers are aware of maps as a “snapshot” in time, map review with a null finding is often deemed sufficient to exclude the possibility of historic-period archaeological sites. cursory review and premature findings can lead to costly, inadvertent discoveries that should have been avoided. Archaeological investigations in Vermont have increasingly identified late-eighteenth-century through nineteenth-century residential sites that are not depicted on nineteenth-century maps.

In general for the entire area, historic archaeological sites can occur in or near present-day municipalities and villages as well as along historic-period roads, particularly cross-roads. Sites may also be found along certain railway sections and waterways.

Archaeological sites consist of remains and locations exhibiting evidence (usually artifacts) of past human activity. These sites can be associated with both the prehistoric and historic periods and can be visible on the ground surface or buried. In general, prehistoric sites consist of villages, camps, rock shelters, workshops, quarries, and a variety of specialized activity areas such as fishing and resource processing camps. Historic archaeological sites generally consist of farmsteads, refuse dumps, privies, and residential sites as well as buried infrastructure sites such as roads and canals. Historic-period archaeological deposits are also common in urban settings.

7.11.2.5 Above-Ground Historic Property Types

There are numerous above-ground historic properties along the New England border area that are National Register listed, eligible, or potentially eligible for listing. This is particularly true for Maine and parts of Vermont.

As a primarily rural, agricultural state, historic buildings in Maine tend overwhelmingly to be residential and small-scale commercial (i.e., smaller downtown business districts). While the earliest houses in the state, from the late-seventeenth century and early-eighteenth century, tend to be along the coast, several eighteenth-century houses exist in the southern portions of the study area. Most of the counties in the central and northern parts of the state, however, show few if any eighteenth-century buildings. Houses from the early eighteenth century generally are one- or one-and-one-half-story buildings, often constructed of logs, while houses from the middle and later parts of the eighteenth century are one, one and one-half, or two stories in height, constructed around a timber frame, and generally with a central brick chimney and unadorned wood siding.

The northern portion of Maine, principally Aroostook County, was in flux through the early nineteenth century as a result of the uncertainty over the border with Canada. Border tensions led to the creation of a blockhouse fort (now located in Fort Kent) along the St. John River. The early architectural traditions in northern Aroostook County along the border remained influenced by the Acadian settlers, whose building technology differed from that of their English counterparts in the lower part of the state. The Acadian vernacular architectural traditions in the eighteenth century included log houses that used tenons at the corners rather than notches.

Further from the new and establishing towns of the central and southern portions of the state, in the St. John River Valley along Maine’s northern border with Canada, residential architecture tended to be more conservative in style and continued to reflect the Acadian origins. Greek-

Revival influences remained longer in these rural areas and can be seen in the variations of vernacular Acadian house types, including the one-and-one-half-story, front-gable, half-cape house that is scattered throughout the central and northern portions of the state. By the early and mid-twentieth century, however, examples of high-style residential architecture including variations on the Colonial-Revival and Mediterranean styles can be found throughout the state.

One of Maine's principal agricultural crops led to the establishment of a particular form of agricultural building: the potato barn. Set partially below grade with only the roof extending above the ground, examples of nineteenth-century potato barns can be seen throughout the northern parts of the state, especially in northeastern Aroostook County. In addition to residences, Maine's industrial heritage continues to be represented in historic architecture. Some small-scale industrial buildings remain in the southern portion of the study area: small mill buildings that made use of the limited fall of the rivers and their tidal movement as they approached the coast. More common, though, are the large-scale factory buildings relating to the state's industries, principally paper and textiles. By the late-nineteenth century and early twentieth century, these buildings tended overwhelmingly to be built of brick, two- to four-stories high, with rows of multi-paned, metal-framed windows. Like the sporting camps, many of these older factory buildings tended to be located along the state's rivers, to take advantage of the available hydropower. These buildings are found most often in the smaller and mid-sized Piedmont cities such as Waterville, Auburn, Madison, and Skowhegan. Maine also has a long history of the use of hydroelectric power. Dating from the 1890s into the mid-twentieth century, many hydroelectric powerhouses remain and generally are considered historically significant.

One type of monument likely to be found in the extreme northern parts of Maine is the border monument. These monuments are small obelisks, approximately three-feet high, and are made of either concrete or metal.

The study area in New Hampshire and Vermont consists of sparsely populated rural agricultural and forested lands. Historic buildings in the northern and central regions of these two states mostly reflect vernacular interpretations of popular architectural styles that may feature some elements found in a particular style. One of the oldest log cabins in the nation, Hyde Log Cabin (ca. 1783), is located in Grand Isle, Vermont. The region's vernacular architecture incorporates an individual builder's ideas into the overall design as well as influences from architectural traditions and customs adapted from European settlers. The mixture of the vernacular and high-style examples in New Hampshire and Vermont enhance the overall character of each state's historic architecture.

New Hampshire and Vermont are also recognized for their rich agricultural history, which is reflected in the existing farmsteads and agricultural landscape found across the North Country regions of these two states. The Connecticut River, which serves as the boundary between the two states, is a national scenic byway. This natural and historic-river corridor has been referred to as "the heart" of New England because of the vital role it has played in the 250-year development of the region. The Connecticut River Valley contains many riverside villages as well as rural farming villages. The two states are further distinguished for their collection of covered bridges. With a total of 106 bridges, Vermont possesses the most covered bridges in the Nation.

The northern portions of New Hampshire and Vermont contain numerous state parks and several historic sites such as the following in Vermont: the President Chester A. Arthur State Historic Site, Chimney Point Historic Site in Addison on Lake Champlain, and Senator Justin S. Morrill Homestead. Chimney Point on Lake Champlain in Vermont is one of the earliest, most intensely settled, and most strategic sites in the Champlain Valley, with human habitation going back as far as 7,500 years. The Champlain Lake and the Upper Hudson River valleys in Vermont and New York contain the largest number of eighteenth-century forts and battlefields associated with key struggles in the French and Indian War and the Revolutionary War.

A small fraction of the New England Region has been previously inventoried and evaluated for historic structures. Actual numbers of recorded, above-ground historic properties and previous project-survey boundaries exist in SHPO databases and files, but exact numbers of cultural resources are not readily available for this overview. As is the case with other site types in the study area, there is a high probability of discovering previously unrecorded and significant above-ground historic properties that will meet the criteria for listing in the National Register.

Tables 7.11-1 and 7.11-3 identify historic properties that have been designated as historically important at the national, state, and local levels and briefly describe the historic environments in the vicinity of CBP facilities in the New England Region. Table 7.11-2 lists the historic buildings located on CBP properties in Maine.

Table 7.11-1. Cultural Resources in the Vicinity of CBP Facilities in Maine

Component *	Type**	Name	Address	National, State, and Local Historical Designations and Environment
OFO	POE	Eastport (Ferry)	100 Water Street Eastport, ME 04631	Island community; county-wide (partial) intensive survey in 1980; Eastport intensive survey in 1998; Six National Register properties in the vicinity including two National Register districts and Fort Sullivan
OFO	POE	Lubec (Land)	Maine State Route 189 Eastport, ME 04631	Three miles from Eastport; FDR Memorial Bridge; National Register properties in vicinity including two light stations and one lifesaving Station
USBP	BPS	Calais	180 International Ave. Calais, ME 04619	Historically known as commerce center; Three National Register districts and nine National Register properties in the vicinity including one light station. Saint Croix Island International Historic Site is located approximately 9 miles southeast.
OFO	POE	International Avenue	Route 1-Maine State Route 9 Calais, ME 04619	See description for Calais BPS above.
OFO	POE	Milltown Point	North Street at the Border Calais, ME 04619	See description for Calais BPS above.

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Component *	Type**	Name	Address	National, State, and Local Historical Designations and Environment
OFO	POE	Ferry Point	Main Street at the Border Calais, ME 04619	See description for Calais BPS above.
OFO	POE	Vanceboro	Maine State Route 6 Vanceboro, ME 04491	Town located at eastern terminus of Maine State Route 6; part of intensive survey in 1987; no National Register properties listed in the vicinity
USBP	Sector HQ	Houlton	27 Customs Loop Houlton, ME 04730	Town located at northern terminus of Interstate 95; county seat for Aroostook County; part of intensive survey in 1987; 1 National Register district; 11 National Register properties in the vicinity
USBP	BPS	Houlton	27 Customs Loop Houlton, ME 04730	See description for Houlton Sector HQ above.
OFO	POE	Houlton	US Interstate 95 Houlton, ME 04730	See description for Houlton Sector HQ above.
OAM	Air Facility	Houlton	27 Customs Loop Houlton, ME 04730	See description for Houlton Sector HQ above.
OFO	POE	Forest City	Forest City Road at the Border Forest City, ME 04413	Extremely small rural community; no National Register properties in the vicinity
OFO	POE	Monticello	Fletcher Road at the Border Monticello, ME 04760	Small rural community; no National Register properties in the vicinity
OFO	POE	Orient	Boundary Road at the Border Orient, ME 04471	Small rural community; no National Register properties in the vicinity
USBP	BPS	Fort Fairfield	Maine State Route 167 Fort Fairfield, ME 04742	Small rural town; Two National Register properties in the vicinity
OFO	POE	Fort Fairfield	4 Boundary Line Road Fort Fairfield, ME 04742	Small rural community; no National Register properties in the vicinity
OFO	POE	Easton	Ladner Road at the Border Easton, ME 04704	Small rural community; no National Register properties in the vicinity

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Component *	Type**	Name	Address	National, State, and Local Historical Designations and Environment
OFO	POE	Limestone	410 Grand Falls Road Limestone, ME 04750	Small rural town; One National Register property in the vicinity
USBP	BPS	Van Buren	137 Bridge St. Van Buren, ME 04785	Small rural town; Five National Register properties in the vicinity
OFO	POE	Van Buren	137 Bridge St. Van Buren, ME 04785	Small rural community; no National Register properties in the vicinity
OFO	POE	Hamlin	Boundary Road at the Border Hamlin, ME 04785	Small rural community; One National Register property in the vicinity
OFO	POE	Madawaska	63 Bridge Avenue Madawaska, ME 04756	Rural town; northernmost town in New England; Two National Register properties in the vicinity
USBP	BPS	Fort Kent	401 West Main Street Fort Kent, ME 04743	Small rural town; northern terminus of U.S. Route 1; Two National Register properties in the vicinity
OFO	POE	Fort Kent	401 West Main Street Fort Kent, ME 04743	See description for Fort Kent BPS above.
OFO	POE	Estcourt Station	Frontier Road at the Border Estcourt Station, ME 04741	Rural village in Big Twenty Township; northernmost point in Maine; no National Register properties in the vicinity
USBP	BPS	Jackman	2614 Main Street Sandy Bay Township, ME 04945	Small rural town; One National Register property in the vicinity
OFO	POE	Jackman	US 201 Sandy Bay Township, ME 04945	See description for Jackman BPS above.
OFO	POE	Coburn Gore	State Route 27 at the Border, Coburn Gore, ME 04936	Small rural community; One National Register property in the vicinity

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Component *	Type**	Name	Address	National, State, and Local Historical Designations and Environment
OFO	POE	St. Aurelie	Baker Lake Road at the Border Seboomook Lake, ME 04478	Timberlands; no National Register properties in the vicinity
OFO	POE	St. Juste	Realty Rd Seboomook Lake, ME 04478	Remote border station; no National Register properties in the vicinity
OFO	POE	St. Pamphile	Blanchette Road at the Border Northwest Aroostook, ME 00125	Small settlement; remote border station; no National Register properties in the vicinity
OFO	POE	St. Zacharie	Golden Road at the Border Seboomook Lake, ME 04478	Remote border station; no National Register properties in the vicinity
USBP	BPS	Rangeley	96 Main St. Rangeley, ME 04970	Small rural town; center of Rangeley Lakes Region; Four National Register properties in the vicinity

*OFO = CBP Office of Field Operations, USBP = U.S. Border Patrol, OAM = CBP Office of Air and Marine

**POE = Port of Entry, BPS = Border Patrol station

Table 7.11-2. Historic Buildings on CBP Property in Maine

Building Name	Type	City	Number	Year Finished	Rating Class*
U.S. Border Station	Border Station	Calais	ME0009ZZ	1938	5a
U.S. Border Station	Border Station	Calais	ME0501BC	1936	5a
U.S. Border Station Garage	Border Station	Calais	ME0503BC	1936	Not rated
U.S. Border Station	Border Station	Coburn Gore	ME0551BE	1932	5a
U.S. Border Station & Customs Residence	Residence	Coburn Gore	ME0552BE	1936	5a
U.S. Border Station & Immigration Residence	Residence	Coburn Gore	ME0553BE	1936	5a
U.S. Border Station	Border Station	Fort Fairfield	ME0601BF	1934	5a
U.S. Border Station & Immigration Residence	Residence	Fort Fairfield	ME0603BF	1934	Not rated
U.S. Border Station	Limestone	Limestone	ME0701BL	1934	
U.S. Border Station	Border Station	Orient	ME0751BT	1937	5a
U.S. Border Station	Garage	Orient	ME0752BT	1937	5a

Source: USGSA, 1999.

*GSA Historic Rating Class 5a: A building 50-years old or older that has not been evaluated for National Register eligibility but is likely eligible, such as a courthouse, custom house, or historic office building ("Held in Public Trust" Appendix C; see footnote above).

Table 7.11-3. Cultural Resources in the Vicinity of CBP Facilities in New Hampshire and Vermont

Component*	Type*	Name	Address	National, State, and Local Historical Designations and Environment
NEW HAMPSHIRE				
OFO	POE	Pittsburg Station	Route 3 at the Border, (Daniel Webster Hwy) Pittsburg, NH 03592	Located in Great North Woods Region; largest town by area in state; sparsely populated; wilderness conditions; One State Register property and no National Register properties in the vicinity
VERMONT				
OFO	POE	Beecher Falls	1429 Vermont Route 253 Beecher Falls, VT 05902	Rural village in Town of Canaan; no National Register properties in vicinity
OBP	BPS	Beecher Falls	1429 Vermont Route 253 Beecher Falls, VT 05902	See description for Beecher Falls POE above.
OFO	POE	Derby Line	Interstate 91 Derby Line, VT 05830	Rural village in Town of Derby; One of two villages where U.S.-Canadian border runs through community; One National Register property in village; Two National Register properties in town
OFO	POE	Beebe Plain Station	Beebe Road at the Border Beebe Plain, VT 05823	Very small rural village in Town of Derby; One of two villages where U.S.-Canadian border runs through community; no National Register properties in village; Two National Register properties in town
OFO	POE	Derby Line (Route 5)	US Route 5 at the Border, Derby Line, VT 05830	Rural village in Town of Derby; One of two villages where U.S.-Canadian border runs through community; One National Register property in village; Two National Register properties in town
OFO	POE	North Troy Station	VT 243 at the border, North Troy, VT 05859	Small rural village in Town of Troy; no National Register properties in the vicinity
OFO	POE	Highgate Springs	Interstate 89 at the Border, Highgate Springs, VT 05460	Small rural village in Town of Highgate; no National Register properties in the vicinity

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Component*	Type*	Name	Address	National, State, and Local Historical Designations and Environment
OFO	POE	Alburg Springs Station	Alburg Springs Road at the Border, Alburg, VT 05440	Small rural village in Town of Alburg; no National Register properties in the vicinity
OFO	POE	Alburg Station	VT 225 at the Border, Alburg, VT 05440	Rural town with lakeside community; U.S.-Canadian border officials share same building; One National Register property in the vicinity
OFO	POE	Morses Line Station	VT Route 235 at the Border/Morses Line Rd Franklin, VT 05457	Small unincorporated village on U.S.-Canadian border; no National Register properties in the vicinity
OFO	POE	Norton	Vermont Route 147, Norton, VT 05907	Rural town; no National Register properties in the vicinity
OFO	POE	Canaan Station	VT 141 at the Border, Canaan, VT 05903	Small rural town; One National Register property in the vicinity
OFO	POE	Richford	Vermont Route 139 Richford, VT 05476	Rural town; farmlands; Five National Register properties and one National Register district in the vicinity
OFO	POE	East Richford Station	VT 105/Glen Sutton Rd, Richford, VT 05476	See description for Richford POE above.
OFO	POE	Pinnacle Road Station	Pinnacle Road at the Border, Richford, VT 05476	See description for Richford POE above.
OFO	POE	West Berkshire Station	VT 108 at the Border, Richford, VT 05476	Rural village in Town of Berkshire; no National Register properties in Village; One National Register property in town
OFO	POE	St. Albans	50 S. Main St, Suite 100R St. Albans, VT 05478	Rural town; Nine National Register properties and one National Register district in the vicinity

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Component*	Type*	Name	Address	National, State, and Local Historical Designations and Environment
OBP	BPS	Richford Station	80 Main St Richford, VT 05476	Rural town; farmlands; Five National Register properties and one National Register district in the vicinity
OBP	Air Facility	Swanton Station	62 Airport Rd, Swanton, VT 05488	Rural town; center of Abenaki activity and culture; Six National Register properties in the vicinity
OBP	Sector HQ	Swanton Station	62 Airport Rd, Swanton, VT 05488	See description for Swanton Station Air Facility above.
OAM	BPS	Swanton	62 Airport Rd, Swanton, VT 05488	See description for Swanton Station Air Facility above.

*OFO = CBP Office of Field Operations, USBP = U.S. Border Patrol, OAM = CBP Office of Air and Marine

**POE = Port of Entry, BPS = Border Patrol station

Table 7.11-4. Historic Buildings on CBP Property in Vermont

Building Name	Type	City	Number	Year Finished	Rating Class*
Border Station Immigration Residence	Residence	West Berkshire	VT0852BW	1935	
U.S. Border Station	Border Station	Beebe Plain	VT0601BP	1937	
U.S. Border Station	Border Station	West Berkshire	VT0851BW	1935	
U.S. Border Station	Border Station	North Troy	VT0751BT	1937	
U.S. Border Station	Border Station	Norton	VT0801BN	1934	
U.S. Border Station	Border Station	Alburg Springs	VT0551BS	1937	
U.S. Border Station	Border Station	Beecher Falls	VT0002ZZ	1932	
U.S. Border Station	Border Station	Derby Line	VT0651PD	1932	
U.S. Border Station	Border Station	Canaan	VT0007ZZ	1935	
U.S. Border Station Cattle Inspection	Other	Derby Line	VT0653PD	1932	
U.S. Border Station East Richford	Border Station	East Richford	VT0008ZZ	1931	
U.S. Border Station Garage	Garage	Derby Line	VT0652PD	1931	
U.S. Border Station Garage	Garage	Beebe Plains	VT0602BP	1937	
U.S. Border Station Garage	Garage	Alburg Springs	VT0552BS	1937	
U.S. Border Station	Border Station	Richford	VT0014ZZ	1934	

7.11.2.6 Native American Resources

This section provides information about the potential location of Native American cultural resources, sacred sites, and traditional cultural properties (TCPs) in the New England Region, based on the geographic location of Native Americans both historically and in the present. There are five tribal groups within the New England area (Table 7.11-4). Three of these Tribes have

reservations within the New England Region study area, all of which are in the State of Maine (Figure 7.11-1). No federally recognized Tribes are located in New Hampshire or Vermont

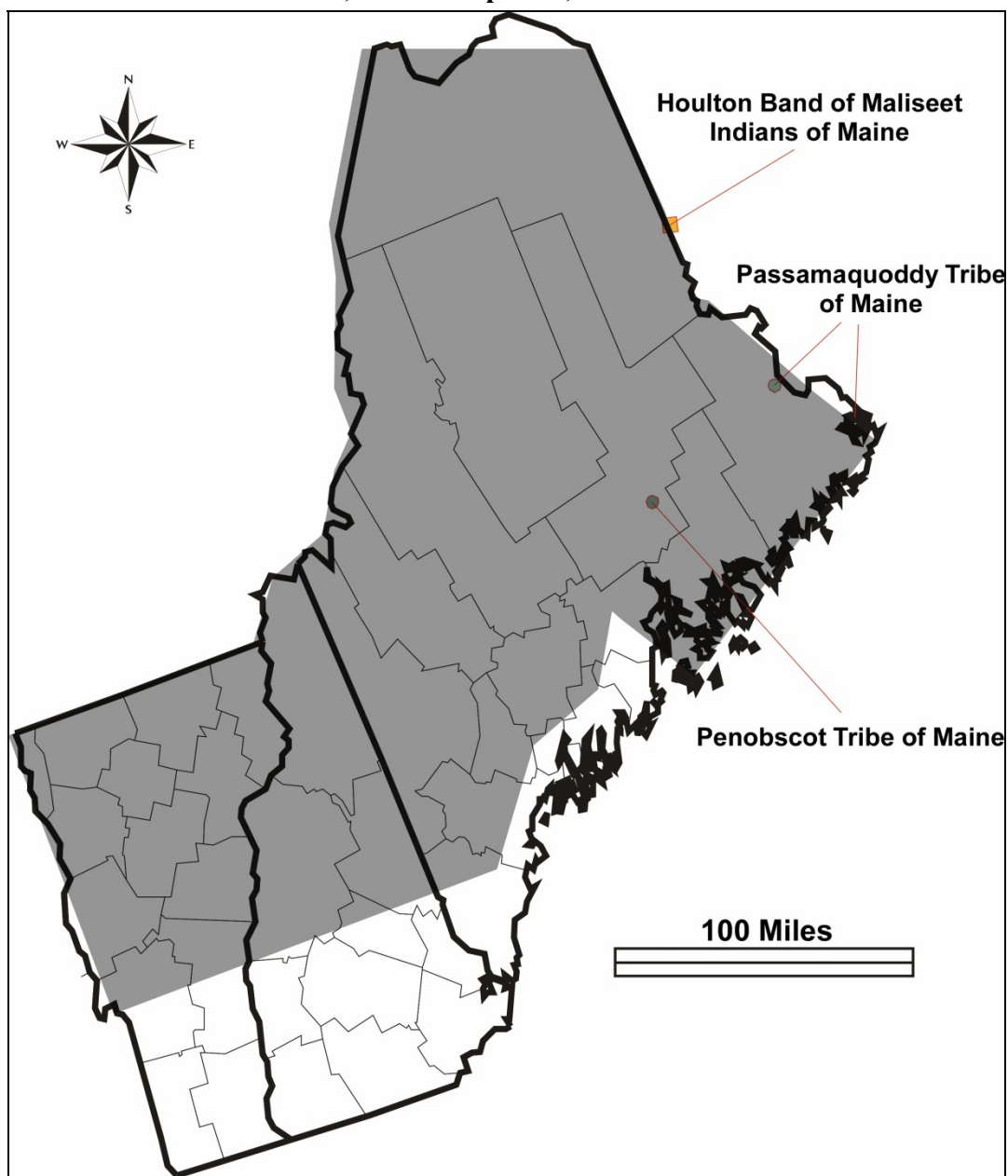
Table 7.11-5. Native American Tribes that have a Reservation, Judicially Established Interest, or Established Traditional Ties to Land within the 100-mile PEIS Corridor

Aroostook Band of Micmac Indians
Houlton Band of Maliseet Indians of Maine
Passamaquoddy Tribe of Maine
Penobscot Tribe of Maine
Wabanaki Nation

The following maps indicate federally recognized Tribes that have a reservation within approximately 100 miles of the Canadian border, have a judicially established connection to land within the 100-mile corridor, or have established traditional ties that may involve traditional cultural properties or archaeological sites. The maps include:

1. A map of Indian reservations located within the 100-mile corridor (Figure 7.11-1);
2. A USGS map showing nineteenth-century cessions, reservations, and portages (Figure 7.11-2). This map was retrieved from ancestry.com; while the sourcing is unclear, the accuracy is corroborated by a 1992 map compiled by the Bureau of Indian Affairs and a 1998 GIS layer created by USGS (not included). The map shows Tribes that had a presence along the northern border 100 years ago and indicates cases where Indian lands were ceded prior to that period;
3. A USGS map showing judicially established Indian land areas as of 1978 (Figure 7.11-3). The map portrays the results of cases before the U.S. Indian Claims Commission or U.S. Court of Claims in which an American-Indian Tribe proved its original tribal occupancy of a tract within the continental United States; and,
4. A USGS map indicating early tribal, cultural, and linguistic areas (Figure 7.11-4). The information was derived from anthropological, archaeological, and linguistic studies. The map generally corroborates the other maps with regard to traditional tribal areas.

Figure 7.11-1. Native American Lands Within the 100-mile PEIS Corridor Crossing Maine, New Hampshire, and Vermont



Source: USDOL, 1991.

Note: A shaded 100-mile corridor has been added.

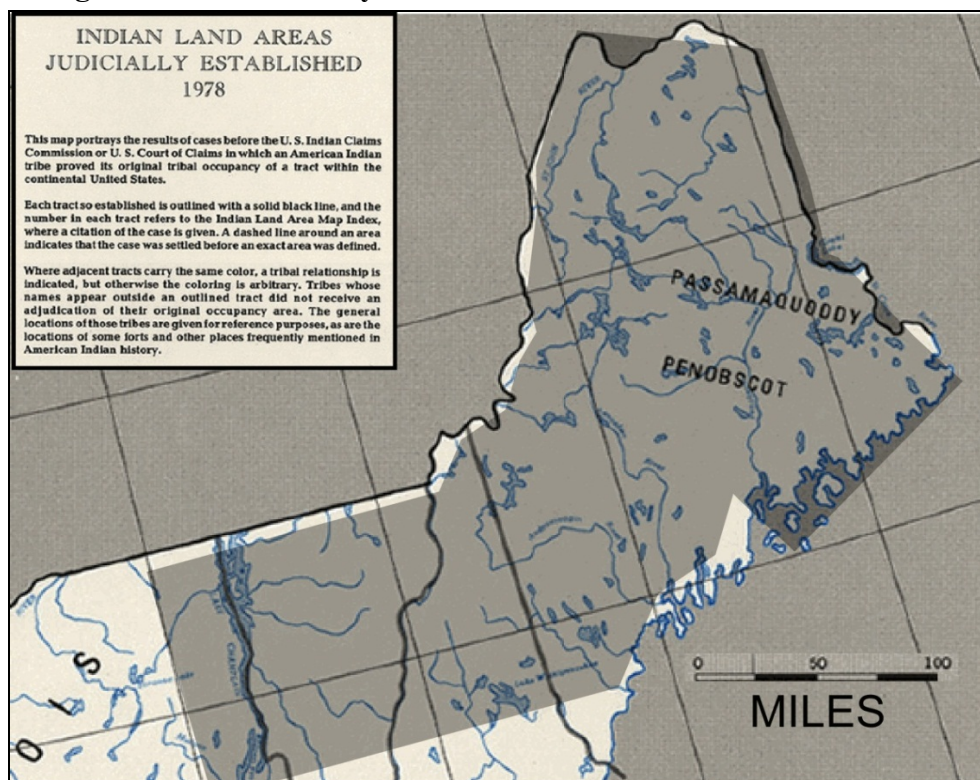
Figure 7.11-2. Nineteenth-Century Cessions, Reservations, and Portages (1907)



Source: (ancestry.com, No Date).

Note: A shaded 100-mile corridor has been added.

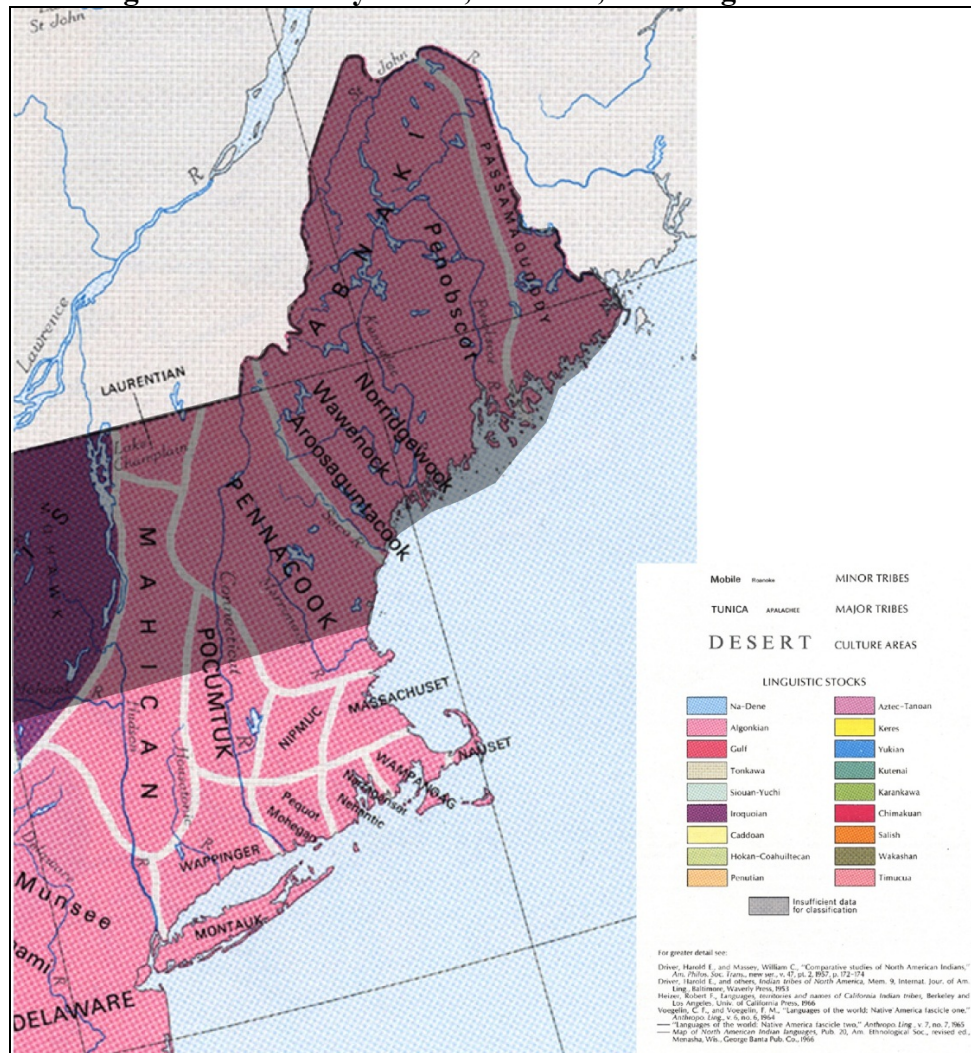
Figure 7.11-3. Judicially Established Indian Land Areas as of 1978



Source: USDOJ, 1978.

Note: A shaded 100-mile corridor has been added.

Figure 7.11-4. Early Tribal, Cultural, and Linguistic Areas



Source:(USDOJ, 1991).

Note: A shaded 100-mile corridor has been added.

7.11.2.7 Paleontological Resources

As with archaeology, paleontologists use a variety of information and techniques to carry out *predictive modeling*, the process of assessing the probability of existence of paleontological sites in a given location. This section provides an overview of the current understanding of paleontological site probability in the New England Region. An expanded discussion of paleontological resources and references can be found in Appendix H.

Within the study area, four major geological groups were identified: sedimentary, volcanic, plutonic, and metamorphic. Of these rock groups, only sedimentary rocks have a high or moderate potential for containing paleontological materials. Both plutonic and volcanic rocks rarely contain fossils because igneous environments are not suitable for living things. Metamorphic rocks rarely contain fossils because the conditions of metamorphism tend to alter the texture of the rocks and destroy any fossils contained within.

Maine

Paleontological-sensitive geological units in Maine include Paleozoic and Cenozoic deposits. Paleozoic deposits containing fossils have been destroyed by metamorphism associated with orogenies (mountain-building events) within the southern portion of the study area only. In all other areas, the Paleozoic deposits are intact. Paleozoic deposits represent sea-level fluctuations and include habitats ranging from nearshore to deepwater. Fossils from these geological units include numerous invertebrates. Cenozoic deposits consist of retreating glacial deposits containing many different plant and large-vertebrate fossils.

New Hampshire

Paleontologically sensitive geological units in New Hampshire include only a very small area in the north of the state. These units are only of Cenozoic age because metamorphism associated with the orogenies destroyed or altered any sediments formed during Paleozoic times. Cenozoic deposits consist of retreating glacial deposits containing many different plant and large-vertebrate fossils.

Vermont

Paleontologically sensitive geological units in Vermont include Paleozoic and Cenozoic deposits. Paleozoic deposits containing fossils are sparse in Vermont, and metamorphism associated with the orogenies destroyed or altered any sediments formed at this time. Paleozoic sediments include sandstone, siltstone, and mudstone and contain bryozoans, brachiopods, cephalopods, gastropods, sponges, and trilobites. Cenozoic deposits consist of Pleistocene glacial deposits containing large-vertebrate fossils.

7.12 ENVIRONMENTAL JUSTICE AND PROTECTION OF CHILDREN

7.12.1 INTRODUCTION

Executive Order (EO) 12898 of February 11, 1994 (EO 12898, 1994), titled “Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations,” requires that each Federal agency identify and address any disproportionately high and adverse effect of its programs, policies, and activities on minority and low-income populations. The USEPA defines *environmental justice* as “the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies” (USEPA, 2010).

EO 13045 of April 21, 1997 (EO 13045), titled “Protection of Children from Environmental Health Risks and Safety Risks,” places a high priority on the identification and assessment of environmental health and safety risks that may disproportionately affect children. The order requires that each agency “ensure that its policies, programs, activities, and standards address disproportionate risks to children that result from environmental health or safety risks.” EO 13045 considers that physiological and social development of children makes them more sensitive than adults to adverse health and safety risks and recognizes that children in minority, low-income, and indigenous populations are more likely to be exposed to, and have increased health risks from, environmental contamination than the general population (USEPA, 2010).

7.12.2 AFFECTED ENVIRONMENT

This section describes the affected environment for the assessment of potential environmental-justice effects that could result from implementation of any of CBP’s program alternatives in the New England Region. The affected environment identifies and describes minority and low-income populations, as well as populations of children that may be present in the defined study area and that may be differentially affected by actions proposed under each of the alternatives considered in this PEIS.

The study area for the evaluation of environmental-justice effects is defined—in accordance with Section 7.10, Socioeconomic Resources—as the border communities in both the United States and Canada within 100 miles of the U.S.-Canada border. The U.S. portion of this study area (New England Region) includes the border communities in the States of Maine, New Hampshire, and Vermont. The study area north of the New England Region in Canada includes the border communities in the Provinces of Quebec, New Brunswick, and Nova Scotia. For comparison purposes, the analysis also includes the populations of the respective border states and Canadian provinces as a whole. Border communities are defined geographically by the administrative boundaries of U.S. counties and Canadian census divisions contained within or overlapping the study area. A detailed demographic analysis of the study area is in Section 7.10.

7.12.2.1 Minority Populations

The most recent USCB data (USDOC, 2000a) for minority populations available for all counties and states in the United States are part of the Decennial Census for the year 2000. Statistical data from this census have been used to characterize the minority populations within the New

England Region. Summary statistics for minority populations in the New England Region, their respective states, and the Nation are presented in Table 7.12.-1.

In general, minority populations are not present in the New England Region at higher levels than in either the respective states or the national population as a whole. Minority populations do not exceed four percent of the population in the border communities of any of the three states in the region or in the combined New England Region as whole.

The individual states of the New England Region are relatively homogeneous by population. Minority percentages for the border communities in each of the individual states and for the larger state populations are relatively consistent, differing by less than one percentage point across all jurisdictions and for the combined New England regional total. Populations of Asian, Native Hawaiian, Pacific Islander, and Others constitute the largest single minority identification in the New England Region, with one percent of the total population. Persons of Hispanic origin represent the second largest group, with 0.8 percent of the population.

**Table 7.12-1. Minority Statistics for the New England Region
(Percent of Population)**

Border State/Region*		White	Black or African American	American Indian and Alaska Native	Asian, Native Hawaiian, Pacific Islander, Other	More Than One Group	Hispanic Origin**
Maine	New England Region	96.9	0.5	0.6	0.9	1.1	0.7
	Statewide	97.0	0.5	0.6	0.9	1.1	0.7
New Hampshire	New England Region	97.1	0.4	0.3	1.0	1.2	0.8
	Statewide	96.0	0.7	0.2	1.9	1.2	1.6
Vermont	New England Region	96.6	0.5	0.5	1.1	1.3	0.8
	Statewide	96.7	0.5	0.4	1.0	1.3	0.9
New England Region Total	New England Region	96.9	0.5	0.5	1.0	1.2	0.8
	Selected States	96.5	0.6	0.4	1.3	1.2	1.1
Total United States		75.1	12.2	0.9	9.2	2.6	12.5

Source:(USDOC, 2000a).

*Statistics presented in the unshaded rows include only those portions of the states that lie within the study area; this includes all counties overlapping the area within 100 miles south of the border.

**Hispanic origin is an ethnicity that may include individuals who are also represented in other categories (such as White or Black). Therefore, Hispanic origin is a separate measure and is calculated separately from the other categories.

The minority populations north of the New England Region in Canada are represented by data from the 2006 Census of Canada (Table 7.12-2). Similar to the U.S. portion of the study area, border communities in the three provinces are relatively homogeneous. The minority segment of the border communities represents 9.2 percent of the total population, approximately 7 percent smaller than the minority component of the national population. There are no segments of the study area north of the New England Region, or of the three provinces containing the study area, in which the minority component of the population exceeds ten percent.

The “Other Visible Minority” classification (including multiple ethnicities) constitutes the largest single minority category in the study area north of the New England Region in Canada. This category consists primarily of the following groups: Chinese, South Asian, Arab, West Asian, Filipino, Southeast Asian, Latin American, Japanese, and Korean. However, with the exception of Quebec, Aboriginal Peoples constitute the largest single identifiable minority within the study area. The percentage of the population represented by Aboriginal Peoples in the study area does not exceed 7 percent in any jurisdiction.

Table 7.12-2. Visible Minority Statistics North of the New England Region in Canada* (Percent of Population)

Border Province/Region**		Not a Visible Minority	Black	Other Visible Minority	Two or More Visible Minorities	Aboriginal Peoples***
New Brunswick	North of New England Region	97.8	0.7	1.4	0.1	2.6
	Province	98.1	0.6	1.2	0.1	2.5
Nova Scotia	North of New England Region	97.6	1.7	0.6	0.1	7.0
	Province	95.8	2.1	1.9	0.1	2.7
Quebec	North of New England Region	90.3	2.7	6.6	0.2	0.8
	Province	91.2	2.5	6.1	0.2	1.5
North of New England Region Total	North of New England Region	90.8	2.6	6.2	0.2	1.0
	Selected Provinces	92.2	2.3	5.3	0.1	1.7
Total Canada		83.8	2.5	13.3	0.4	3.8

Source:(StatCan, 2006a).

*Canada's Employment Equity Act (2005) defines *visible minorities* as "persons, other than Aboriginal peoples, who are non-Caucasian in race or non-white in color."

**Statistics presented in the unshaded rows account only for those portions of the provinces that lie within the study area; this includes all census divisions overlapping the area within 100 miles north of the border.

***The "Other Visible Minority" population consists mainly of the following groups: Chinese, South Asian, Black, Arab, West Asian, Filipino, Southeast Asian, Latin American, Japanese, and Korean.

****Self-identification by Aboriginal Peoples does not preclude self-identification inclusion in one of the other categories. The "Aboriginal Peoples" column of this table is, therefore, not additive with the other columns.

7.12.2.2 Low-Income Populations

Data from the most recently completed USCB (USDOC, 2000b; USDOC, 2000c) were used to characterize low-income minority populations in the New England Region border-community study area. Median household income and poverty rates are in Table 7.12-3.

The median household income for the combined population of the border communities in the New England Region in 2000 is \$50,069. This is \$3,987 lower than the combined median for the three individual states that make up the New England Region and \$2,982 lower than the national median household income. For the individual states of Maine and Vermont, median income for the border communities is slightly higher than for the entire state population as a whole. In New Hampshire, the median household income of the border communities is substantially lower, by \$7,605, than the median for the state population as a whole.

Within the individual states of the region, the border communities of Maine and Vermont have poverty rates substantially the same as that for their respective state as a whole; however, poverty levels among the border communities of Maine were 0.1 percent higher than that for the state as a whole. In the State of New Hampshire, poverty levels for the border communities exceed the level for the state by 0.8 percent.

Table 7.12-3. Income and Poverty Statistics for the New England Region

Border State/Region*		Median Household Income** (\$US)	Percent of Population Below the Poverty Line
Maine	New England Region	47,503	11.0
	Statewide	47,046	10.9
New Hampshire	New England Region	54,887	7.3
	Statewide	62,492	6.5
Vermont	New England Region	52,338	9.4
	Statewide	51,614	9.4
New England Region Total	New England Region	50,069	9.9
	Selected States	54,056	8.9
Total United States		53,051	12.4

Source: (USDOC, 2000b; USDOC, 2000c).

*Statistics presented in the unshaded rows include only those portions of the states that lie within the study area; this includes all counties overlapping the area within 100 miles south of the border.

**Median household income is reported from the 2000 USCB in inflation-adjusted 2009 U.S. dollars.

Median household income and poverty levels for the border communities north of the New England Region in Canada are represented by data from the 2006 Census of Canada. Statistics for these communities and their respective provinces are in Table 7.12-4.

The median income for the combined population of the border communities in the three provinces is \$43,692. This is \$1,016 higher than the median for the total population of the three provinces as a whole, but \$5,701 lower than the national median. Within the individual provinces, the border communities of New Brunswick and Quebec have a higher median household income than their respective provincial populations. The median income for the border communities of Nova Scotia, \$36,138, is substantially lower than the median for the province as a whole.

Poverty levels for the border communities of Nova Scotia are equivalent to that for the provincial population as a whole. For border communities in New Brunswick and Quebec, the percent of low-income families is 0.3 percent higher than that for the population of their respective province.

Table 7.12-4. Income and Poverty Statistics North of the New England Region in Canada

Border Province/Region*		Median Household Income** (\$US)	Percent of Low-Income Economic Families***
New Brunswick	North of New England Region	42,435	10.7
	Province	41,620	10.4
Nova Scotia	North of New England Region	36,138	10.3
	Province	42,920	10.3
Quebec	North of New England Region	43,846	12.6
	Province	42,748	12.3
North of New England Region Total	North of New England Region	43,692	12.5
	Selected Provinces	42,676	11.9
Total Canada		49,393	11.6

Source:(StatCan, 2006b).

*Statistics presented in the unshaded rows include only those portions of the provinces that lie within the study area; this includes all census divisions overlapping the area within 100 miles north of the border.

**Median household income is reported from the 2006 Canadian Census in inflation-adjusted 2009 U.S. dollars.

***The Canadian Census reports statistics for “low-income” economic families. This threshold-based designation is comparable to the poverty statistics reported in the USCB. An *economic family* is a group of two or more persons who live in the same dwelling and are related to each other by blood, marriage, common-law, or adoption. A couple may be of opposite or same sex. Foster children are included.

7.12.2.3 Population of Children under 18 Years of Age

The distribution of population by age for the U.S. border communities of the New England Region is in Table 7.12-5. For the border communities within individual states and for the states that make up the New England Region, the percentage of children under the age of 18 does not exceed the percentage in the national population.

**Table 7.12-5. Age Distribution in the New England Region
(Percent of Population)**

Border State/Region*		Under 18	18-24	25-34	35-44	45-54	55-64	65+
Maine	New England Region	23.7	8.3	12.4	16.8	15.1	9.6	14.2
	Statewide	23.6	8.2	12.3	16.8	15.1	9.7	14.4
New Hampshire	New England Region	23.5	8.4	11.6	16.8	15.4	9.8	14.5
	Statewide	25.0	8.3	12.9	18.0	14.9	8.9	12.0
Vermont	New England Region	24.3	9.7	12.4	16.8	15.3	9.2	12.3
	Statewide	24.2	9.4	12.2	16.8	15.4	9.3	12.7
New England Region Total	New England Region	23.8	8.6	12.2	16.8	15.2	9.5	13.8
	Selected States	24.3	8.5	12.5	17.2	15.1	9.3	13.1
Total United States		25.6	9.6	14.1	16.3	13.4	8.6	12.4

Source:(USDOC, 2000c).

*Statistics presented in the unshaded rows account only for those portions of the states that lie within the study area; this includes all counties overlapping the area within 100 miles south of the border.

The distribution of population by age for the border communities north of the New England Region in Canada is in Table 7.12-6. For the border communities in all three provinces of the region, children under 20 years of age represent 23.1 percent of the total population of the study area. This is comparable to the percentage of children in the combined population of the three provinces but slightly lower than the national percentage. For border communities in each of the individual provinces and for the population of the individual provinces as a whole, the percentage of children in the population does not exceed the national percentage.

**Table 7.12-6. Age Distribution North of the New England Region in Canada
(Percent of Population)**

Border Province/Region*		Under 20	20-24	25-34	35-44	45-54	55-64	65+
New Brunswick	North of New England Region	23.8	6.1	11.9	15.0	16.4	12.7	14.0
	Province	23.1	6.2	12.1	15.1	16.5	13.0	14.1
Nova Scotia	North of New England Region	22.2	5.0	9.7	14.6	16.1	14.8	17.6
	Province	23.0	6.2	11.6	15.1	16.4	13.2	14.5
Quebec	North of New England Region	23.1	6.4	13.0	15.1	16.4	12.6	13.4
	Province	23.2	6.3	12.9	15.0	16.5	12.7	13.5
North of New England Region Total	North of New England Region	23.1	6.3	12.9	15.0	16.4	12.7	13.5
	Selected Provinces	23.2	6.3	12.7	15.0	16.5	12.8	13.6
Total Canada		24.7	6.6	12.8	15.3	15.8	11.7	13.0

Source:(StatCan, 2006c).

*Statistics presented in the unshaded row account only for those portions of the province that lie within the study area; this includes all census divisions overlapping the area within 100 miles north of the border.

7.13 HUMAN HEALTH AND SAFETY

7.13.1 INTRODUCTION

Many of the routine activities conducted by CBP in the New England Region have the potential to affect human health and safety (HH&S). HH&S relates to the health and safety of the general public (including vehicle occupants), CBP and station employees, and maintenance personnel. Safety can also refer to safe operations of aircraft or other equipment. This section considers the potential adverse and beneficial impacts of CBP's alternative actions on HH&S.

7.13.2 AFFECTED ENVIRONMENT

Construction

HH&S concerns during construction and modernizing of facilities involve exposing workers to conditions that pose a health or safety risk. Construction site safety is largely a matter of adherence to regulatory requirements. These regulatory requirements are imposed for the benefit of employees and they implement operational practices that reduce risks of illness, injury, death, and property damage. The U.S. Occupational Safety and Health Administration (OSHA) issues standards that specify the amount and type of safety training and education required for industrial workers, the use of protective equipment and clothing, engineering controls, and maximum exposure limits with respect to workplace stressors (29 CFR 1910). CBP applies and adheres to these standards in policy and practice.

Routine Operations

Trade and Travel Processing at POEs

The affected environment of agricultural inspections is the inspection location. Agricultural inspections are typically conducted onsite at POEs, but officers sometimes escort the shipment to the receiver site for inspection (USDHS, 2011). Inspections can also take place on the vessel or train transporting cargo into the United States. After inspection, many types of shipments are released to the appropriate agency.

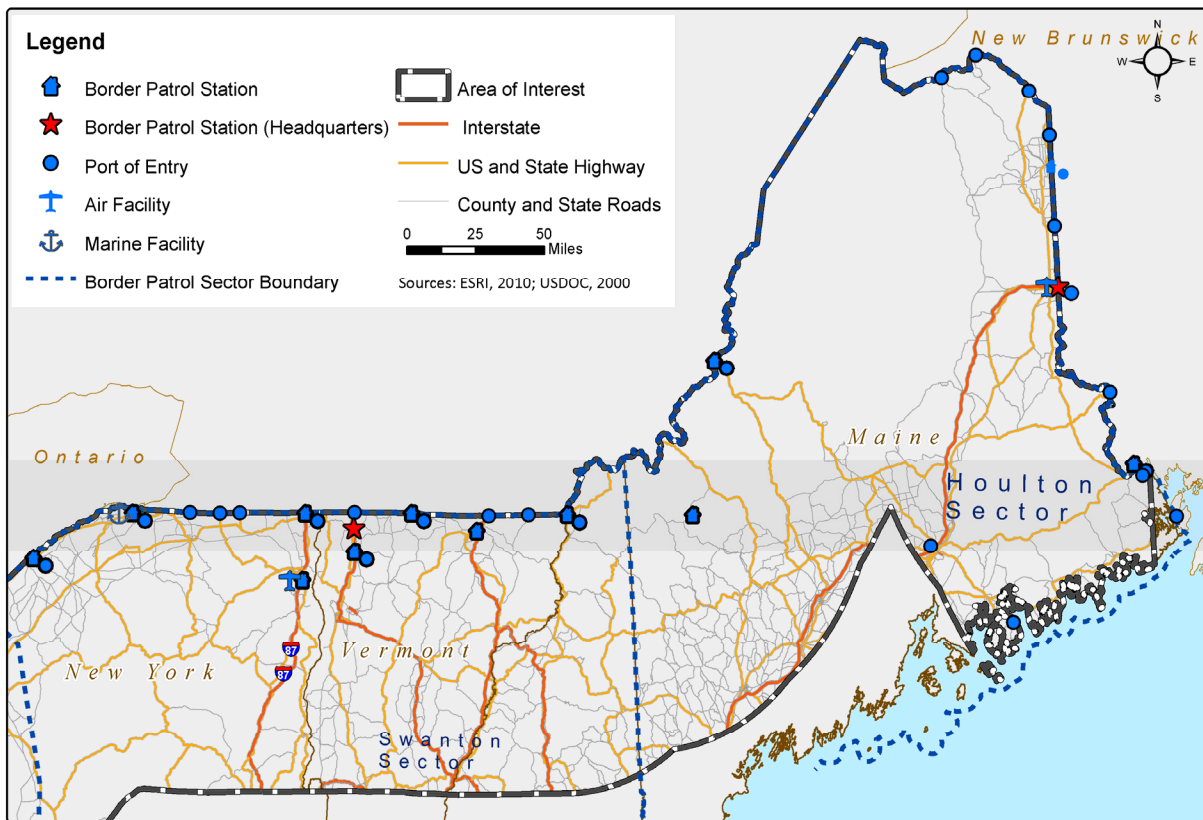
During these interceptions, HH&S effects are possible. Release of nonindigenous diseases into the United States would be harmful to HH&S. To prevent nonindigenous diseases from entering the United States, CBP places bans on certain animals, animal products, and other possible carriers of disease. In 2003, in Canada a positive case of bovine spongiform encephalopathy ("mad cow" disease) touched off an immediate ban on ruminant meat from Canada into the United States. That same year, there was an outbreak of monkey pox in the United States. This outbreak was linked to exotic animals being imported into the United States as pets. A ban was immediately imposed on certain live rodents from Africa, and agricultural specialists still enforce this ban (USDHS, 2004a). Preventing nonindigenous diseases from entering the United States has a beneficial effect on HH&S because it limits the outbreak of disease.

Ground Surveillance and Situational Response Activities

Motorized and Nonmotorized Patrols

Motorized patrols take place on Federal, state, county, and local municipalities' paved roads. Figure 7.13-1 shows U.S. national, state, and county roads that USBP agents can use for motorized patrolling in the New England Region. In rural areas along the border, USBP agents also use dirt roads for motorized and nonmotorized patrols. Dirt roads along the border region were built to be 24-feet wide, but due to vegetation growth the roads are now typically less than 10-feet wide (USDHS, 2011). USBP agents also use other Federal agencies' roads, including roads in national forests and national parks. When possible, the USBP agents remain on existing roads to apprehend cross-border violators but when required they go off road. Off-road vehicles and nonmotorized patrols take place off-road and in remote areas along the border.

Figure 7.13-1. U.S., State, and County Roads in the New England Region



Aircraft Operations

Manned aerial surveillance patrols are operated between 300 feet above ground level (AGL) and flight level (FL) 250. Aircraft patrols are operated at different heights based on different operational and environmental conditions including weather conditions and high traffic environments.

Manned aerial surveillance patrols are conducted along the New England border. The Swanton and Houlton Air and Marine branches possess different equipment and resources for aerial patrols. In order to fly for CBP, OAM agents must have a Federal Aviation Administration

(FAA)-issued license (USDHS, 2010a). Accidents during manned aerial surveillance patrols could potentially injure OAM officers or members of the general public.

Unmanned Aircraft Systems (UAS) are remotely piloted aircrafts, and patrols can occur along the New England Region. UASs are operated at 18,000 feet AGL or higher.

The FAA sets the constraints for where a UAS may operate and how these operations may be conducted safely in the National Airspace System (NAS). Their main focus when evaluating UAS operations in the NAS is to make sure a UAS will not endanger other users of the NAS or compromise the safety of persons or property on the ground.

The FAA recognizes the great potential of UASs in homeland security and strives to accommodate the DHS's needs for UAS operations, without jeopardizing safety. Because airspace is a finite resource, the FAA sets aside Restricted or Prohibited Areas to help mitigate risks. These Restricted or Prohibited Areas are for an operator's exclusive use when needed.

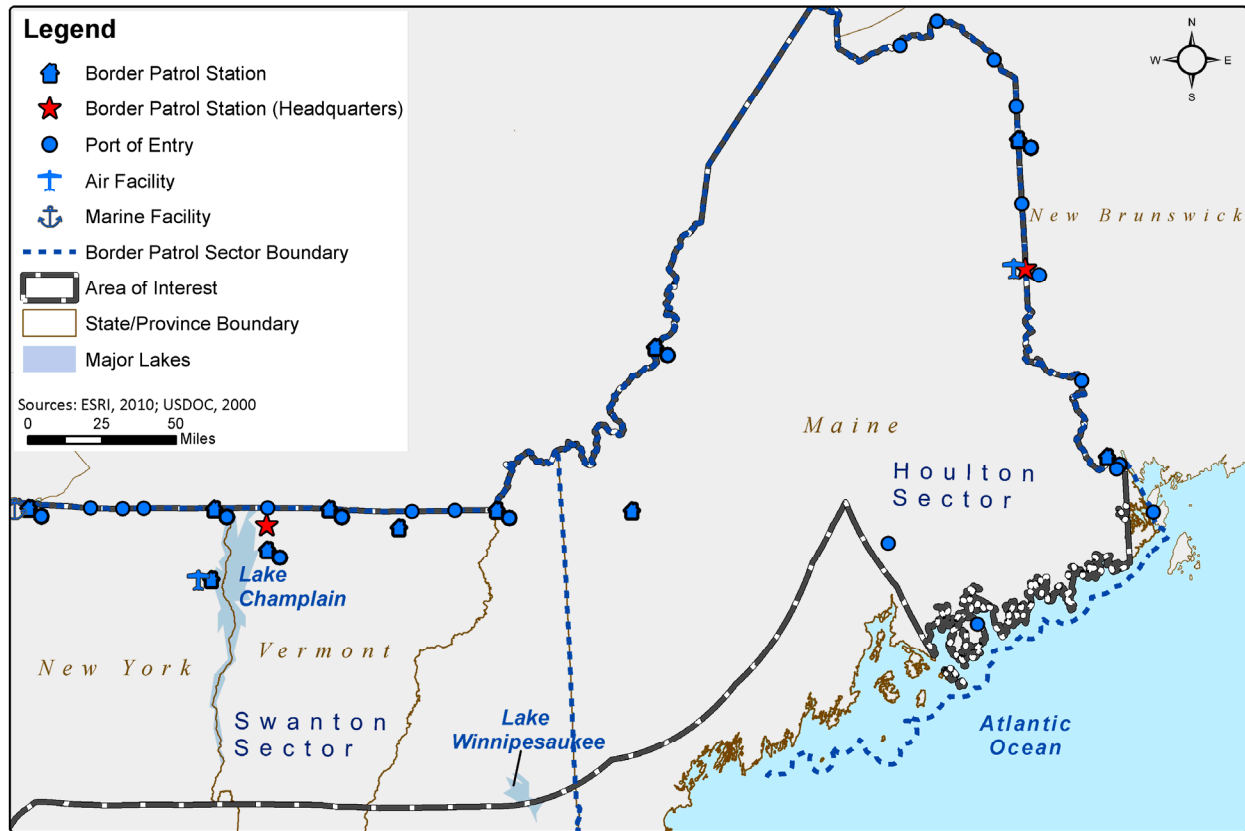
For CBP's UASs to gain access to the civil airspace, CBP must go through the FAA's Certificate of Waiver or Authorization (COA) process. This is the avenue by which public users (Government agencies and Federal, state, and local law enforcement) that wish to fly a UAS can gain access to the NAS, provided that the risks of flying the UAS in the civil airspace can be appropriately mitigated.

To minimize the risk of operating a UAS, the FAA frequently requires risk mitigations before granting a COA. These mitigations include special provisions unique to the requested type of operation. For example, the applicant may be restricted to operating only in a defined airspace or operating only during certain times of the day. The UAS may be required to have a transponder if it is to be flown in a certain type of airspace. Other safety enhancements may be required, depending on the nature of the proposed operation. To ensure safety, the COA application is reviewed for feasibility; airspace experts review and ensure that the operation will not severely impact the efficiency of the NAS. As of April, 2011, CBP has been issued 12 COAs.

Given that there are emergency and disaster situations where the use of UASs has saved lives and otherwise mitigated emergency situations, the FAA has issued three special disaster COAs, one of which was to CBP (Kalinowski& Allen, 2010).

Vessel Operations

There are approximately 563 square miles of navigable waterways in this region (ESRI, 2010), with patrolling occurring mainly on Lake Champlain. Figure 7.13-2 shows the navigable water in this region. To assist in river or lake patrols, OAM provides the USBP agents in this region with a range of watercrafts (USDHS, 2011). Accidents during patrols could take place between CBP, cross-border violators, and the general public.

Figure 7.13-2. Navigable Water in the New England Region

Radiation

CBP uses X-rays and gamma rays to inspect merchandise and conveyances, eliminating the need for an intrusive manual search. These detection systems provide images of material enclosed in cars, trucks, railcars, sea containers, personal luggage, packages, parcels, and mail (USDHS, 2009a). Increasing the efficiency and the number of searches can have a beneficial effect on HH&S. Beneficial effects could result if the number of interdictions increases and the occurrence of intentional destructive acts (IDAs) decreases as a result of using X-ray and gamma rays. The affected environment includes the location of equipment that produces X-rays and gamma rays, as well as the area immediately surrounding the equipment.

X-rays and gamma rays have the potential to expose people to ionizing radiation. The Nuclear Regulatory Commission (NRC) sets regulations and establishes standards for protection against radiation arising from activities conducted under licenses it issues. CBP has adopted the NRC standard because OSHA addresses only

Exposure dose is the dose received by a member of the public from exposure to radiation and to radioactive material released by a licensee, or to another source of radiation either within a licensee's controlled area or in unrestricted areas (USDHS, 2004b).

Occupational dose is the dose received by an individual in a restricted area or in the course of employment in which the individual's assigned duties involve exposure to radiation and to radioactive material from licensed and unlicensed sources of radiation, whether in the possession of the licensee or other person. The individuals subject to the occupational dose classification must closely monitor their degree of radiation exposure using dosimeters (USDHS, 2004b).

occupational dose exposure limits. These requirements are set forth in 10 CFR Part 20 (USDHS, 2004b).

In 10 CFR Part 20, the NRC identifies two classifications of radiation dose: occupational dose and exposure dose (USDHS, 2004b). Neither of these doses includes background radiation, radiation patients receive from medical practices, radiation received from participation in medical research programs, or radiation received as a member of the general public.

As set by the NRC in 10 CFR Part 20, the maximum permissible level of radiation dose to individual members of the general public in unrestricted areas (i.e., exposure dose) is 0.1 rem per year above the typical 0.360 rem per year dose provided by natural and man-made background radiation.

As part of its “as low as is reasonably achievable” (ALARA) program, CBP has determined that the radiation dose received by its personnel shall not exceed the public dose (USDHS, 2004b).

In 10 CFR 20.1003, NRC defines the philosophy of ALARA in relation to exposure:

ALARA (acronym for “as low as is reasonably achievable”) means making every reasonable effort to maintain exposures to radiation as far below the dose limits in this part as is practical consistent with the purpose for which the licensed activity is undertaken, taking into account the state of technology, the economics of improvements in relation to state of technology, the economics of improvements in relation to benefits to the public health and safety, and other societal and socioeconomic considerations, and in relation to utilization of nuclear energy and licensed materials in the public interest.

Exposure to radiation can be harmful to HH&S. Because of the difficulties in determining if the health effects that are demonstrated at high radiation doses are also present at low doses, current radiation protection standards and practices are based on the premise that any radiation dose may result in detrimental health effects, such as cancer and hereditary genetic damage.

When discussing potential impacts caused by radiation exposure, it is important to relate how much exposure is anticipated. In an August 2004 revised position statement on radiation risk, the Health Physics Society recommended against the quantitative estimation of health risks below an individual dose of 0.5 rem in one year or a lifetime dose of 10 rem above that received from natural sources. Doses from natural background radiation in the United States average about 0.360 rem per year (HPS, 2004).

Radio Frequency

The radio frequency (RF) environment refers to the presence of electromagnetic (EM) radiation emitted by radio waves and microwaves on the human and biological environment. RF waves have a frequency or rate of oscillation within the range of approximately 3 Hertz (Hz) to 300 gigahertz (GHz). This energy can interact with matter (USDHS, 2008a).

Uncontrolled exposure occurs when the general public is exposed or when persons employed are not made fully aware of the potential for exposure or cannot exercise control over their exposure (USDHS, 2008a).

Controlled exposure occurs when a person is exposed to RF fields as part of their employment and the person has been made fully aware of the potential exposure and can exercise control over their exposure. (USDHS, 2008a).

OSHA regulates RF and EM emissions for employees under 29 CFR 1910. The Federal Communications Commission (FCC) is responsible for licensing frequencies and ensuring that the approved use does not interfere with television or radio broadcasts, or substantially affect the natural or human environment (USDHS, 2008a). The FCC has adopted a modified version of the American National Standards Institute (ANSI) guidelines and Institute of Electrical and Electronics Engineers (IEEE) standards to evaluate exposure due to RF transmitters licensed and authorized by the FCC. The FCC's guidelines also reflect the National Council of Radiation Protection and Measurements exposure guidelines.

The National Council of Radiation Protection and Measurements and ANSI/IEEE exposure criteria identify the same threshold level at which harmful biological effects may occur. The whole-human-body absorption of RF energy varies with the frequency of the RF signal. The most restrictive limits on exposure are in the frequency range from 30 to 300 megahertz where the human body absorbs RF energy most (USDHS, 2008a).

There are two tiers of exposure limits: occupational or "controlled," and general or "uncontrolled." In order for a transmitting facility or operation to be out of compliance with the FCC's RF guidelines in an area where levels exceed maximum permissible exposure (MPE) limits, it must first be accessible to the public. The MPE limits indicate levels above which people may not be safely exposed regardless of the location where those levels occur (USDHS, 2008a).

Adverse biological effects associated with RF energy are typically related to the heating of tissue by RF energy. This is typically referred to as a thermal effect, where the EM radiation emitted by an RF antenna passes through and rapidly heats biological tissue; similar to the way a microwave oven cooks food. According to the Health Physics Society, numerous studies have shown that environmental levels of RF energy routinely encountered by the general public are typically far below levels necessary to produce significant heating and increased body temperature; RF energy that would produce harmful heating is generally associated only with workplace environments near high-powered RF sources, such as those used for molding plastics or processing food products. In such cases, exposure of human beings to RF energy could exceed MPE and restrictive measures or actions would thus be required to ensure the public's safety (USDHS, 2008a).

There is also some concern that signals from some RF devices could interfere with pacemakers or other implanted medical devices; however, electromagnetic shielding has been incorporated into the design of modern pacemakers to prevent RF signals from interfering with the electronic circuitry in the pacemaker (USDHS, 2008a).

Because RF devices emit RF energy and EM radiation, adverse impacts could occur. The severity of these impacts depends on the equipment used and the elevation of the tower (USDHS, 2008a).

Beneficial impacts from RF devices could also occur. The use of RF could increase the frequency of interdictions along the northern border, improving the HH&S of the United States population.

Firing Ranges

HH&S can be affected by noise levels and exposure to lead from firing ranges on both indoor and outdoor ranges in this region. Humans become exposed to lead associated with shooting ranges through lead-contaminated soil. Another potential pathway is through inhalation of lead dust by shooters during firing when airflow on the firing line is blocked. Range workers may also be exposed to lead dust while performing routine maintenance operations, such as raking or cleaning out bullet traps. Each of these pathways is site specific and may or may not occur at individual ranges (USDA, 2010).

Figure 7.13-3. CBP Officers Train at Firing Range



Source: (USDHS, No Date).

OSHA sets regulations for protecting workers who handle or are exposed to lead, including airborne lead at indoor firing ranges (NSSF, 2001; 29 CFR 1910.1025). The OSHA standard for airborne lead exposure is 30 micrograms per cubic meter of air with an 8-hour time-weighted average (29 CFR 1910.1025).

Spent ammunition on ranges is not regulated as solid/hazardous waste unless it is discarded and left to accumulate for a long period of time. It is not regulated if it is recovered or reclaimed on a regular basis. If the range poses an imminent or substantial danger to human health or the environment, it can be addressed through the Resource Conservation and Recovery Act (RCRA).

USEPA regions also set guidelines and establish best management practices (BMPs) for building new ranges and for remediating outdoor ranges. These guidelines are in place to help minimize lead contamination in soil and water. HH&S would be adversely affected if CBP agents were exposed to lead on firing ranges or if the public's water supply was contaminated with lead (USEPA, 2003). The frequency and severity of response to lead exposure in humans depend on the amount of exposure. Symptoms include neurological, gastrointestinal, reproductive, and renal effects (NYDH, 2009).

In addition to lead exposure, the noise generated on firing ranges may have an adverse effect on the health of CBP agents. Exposure to harmful levels of noise over a long time period can damage sensitive structures in the ear, resulting in noise-induced hearing loss (NIDCD, 2008).

To protect employees from noises at harmful levels, OSHA sets noise standards and guidelines for the work environment. The OSHA noise exposure limit is set at a maximum permissible exposure limit of 90 decibels, A-weighted (dBA), averaged over an 8-hour time period (29 CFR 1910.95).

7.14 HAZARDOUS MATERIALS

7.14.1 INTRODUCTION

Hazardous or regulated materials (HRM) are materials that are capable of posing an unreasonable risk to health, safety, and prosperity. This definition is in accordance to that given in Department of Transportation (DOT) regulations. HRM can be classified into roughly three categories:

- Hazardous or regulated substances;
- Hazardous or regulated waste); and,
- Special hazards.

7.14.1.1 Hazardous Substances

Any substances that are considered severely harmful to human health or the environment may be classified as “hazardous.” Hazardous substances take many forms. Many are commonly used substances that are harmless in their normal uses but are quite dangerous when released. They are defined in terms of those substances either specifically designated as hazardous under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), commonly known as the Superfund Law, or those substances identified under other laws (USEPA, 2011a). A great deal is known about hazardous substances and their effects. This information helps responders act quickly and safely to reduce the risks from emergency situations (USEPA, 2011b).

7.14.1.2 Hazardous Waste

A *hazardous waste* is defined by the Resource Conservation and Recovery Act (RCRA) as a solid waste, or combination of solid wastes, that, because of its quantity; concentration; or physical, chemical, or infectious characteristics may:

- Cause or significantly contribute to an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness; or,
- Pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed.

Hazardous wastes fall into two categories: characteristic wastes and listed wastes. *Characteristic hazardous wastes* are materials that are known or tested to exhibit a hazardous trait such as ignitability (i.e., flammability), reactivity, corrosiveness, and toxicity. *Listed hazardous wastes* are materials specifically listed by USEPA or a state regulation as a hazardous waste. Hazardous wastes listed by the USEPA fall into two categories:

- Process wastes from general activities (F-listed) and from specific industrial processes (K-listed); and,
- Unused or off-specification chemicals, container residues, and spill cleanup residues of acute hazardous-waste chemicals (P-listed) and other chemicals (U-listed).

These wastes may be found in different physical states as gases, liquids, or solids. Furthermore, a waste is deemed hazardous if it cannot be disposed of by common means like other byproducts of our everyday lives. Depending on the physical state of the waste, treatment and solidification processes might be available. In other cases, however, there is not much that can be done to prevent harm (Leonard, 2009).

Certain types of hazardous wastes are subject to special management provisions intended to ease the management burden and facilitate the recycling of such materials. These are called universal wastes; their associated regulatory requirements are specified in 40 CFR 273. Four types of waste are currently covered under the universal waste regulations: hazardous-waste batteries; hazardous-waste pesticides that are either recalled or collected in waste pesticide collection programs; hazardous-waste thermostats; and hazardous-waste lamps.

The RCRA regulates the management and disposal of hazardous waste. One common method of treatment is hazardous combustion, or incineration, which is used to destroy hazardous organic components and reduce the volume of waste (USEPA, 2009a).

7.14.1.3 Special Hazards and Otherwise Regulated Materials

Special hazards are those substances that might pose a risk to human health; they are addressed separately from other hazardous materials. Special hazards include asbestos-containing material, polychlorinated biphenyls (PCBs), and lead-based paint (LBP). The USEPA has the authority to regulate these special-hazard substances under the Toxic Substances Control Act 15 U.S.C. 53. The USEPA has established regulations regarding asbestos abatement and worker safety under 40 CFR 763, with additional regulation concerning emissions (40 CFR 61). Depending on the quantity or concentration, the disposal of LBP waste is potentially regulated by the RCRA at 40 CFR 260. The disposal of PCBs is addressed in 40 CFR Parts 750 and 761.

7.14.2 AFFECTED ENVIRONMENT

7.14.2.1 Hazardous Substances, Hazardous Wastes, Special Hazards, and Otherwise Regulated Materials

Due to the duplicative discussion of hazardous substances, hazardous wastes, special hazards and otherwise regulated materials, complete descriptions of the range of hazards are found in Section 3.14.

7.15 UTILITIES AND INFRASTRUCTURE

7.15.1 INTRODUCTION

Infrastructure consists of the systems and physical structures that enable a population in a specified area to function. Infrastructure is wholly man-made; generally, the more urban and developed an area, the more infrastructure it has (USDHS, 2008a). This section describes ranges of use for each utility resource based on recent CBP site-specific analyses of protection, relocation, construction, and operation of BPSs, and construction, modernization, and operation of POEs. This section then describes the utility resources of most CBP facilities: BPSs, POEs, forward operating bases (FOBs), traffic checkpoints, and communication towers.

7.15.2 AFFECTED ENVIRONMENT

7.15.2.1 Water Supply

Municipal water systems or rural lines, which supply CBP facilities such as the Rangeley, Maine BPS, have the capacity to pump up to 74,000 gallons of water per day from 500,000-gallon-capacity reservoirs, lakes, or systems of groundwater wells (USDHS, 2009k). A substantial reserve capacity remains in these lakes or reservoirs.

For sites with wells present, there are several ways in which water may be provided. Some sites utilize onsite wells by tapping a nearby water main. In more remote locations (where tapping a water main is not feasible), potable water is provided by an onsite well. Generally, wells are within 90 feet of the main building; water is pumped through an inline water filter system and stored in multiple storage tanks. When necessary (and possible), water is filtered, softened, distilled, or treated as required for potable uses. If there is no usable onsite well for potable water, the water may come from a leased, offsite well located several hundred yards away. In a few locations, well water is run through a chlorination or reverse osmosis system for non-drinking usage.

When onsite wells are rendered obsolete, as was the case at the Pittsburg, Morses Line, Pinnacle, and Easton POEs, CBP supplies drinking water in commercial water bottles. At large facilities the delivered potable water is stored in 5-gallon jugs and is sometimes used for cooking. For those few facilities where bottled water is delivered, on average between 50 and 60 gallons are used per month.

7.15.2.2 Electrical and Communications Utilities

Electrical power is provided to most CBP facilities by a commercial grid system. These local or regional utility cooperatives and distribution companies serve from 33,000 to 596,000 customers over a 3,000- to 11,000-square-mile area throughout the New England Region (USDHS, 2009l; USDHS, 2009k; EMEC, 2011). The Maine Public Service Company, the service provider for the Fort Fairfield POE, has a capacity of 154.3 MW (USDHS, 2009l). Central Maine Power, the service provider for the Rangeley POE, had a system peak demand of 1,619 MW in 2010 (CMP, 2011). Primary electrical service is provided by overhead transmission lines to the facilities, and secondary electrical service is provided from a pole-mounted transformer. Many of these facilities have an onsite emergency electric generator with a 275-, 500-, 1,000-, 2,000-, or 6,000-gallon diesel fuel tank (USDHS, 2003h; USDHS, 2003i; USDHS, 2003j).

At seasonal facilities in rural areas, electricity is provided by one or two smaller generators connected to the automatic transfer switches and building power system.

Monopole communication towers do not utilize more than 3,650 kilowatt (kW)-hours per month from commercial grid power (USDHS, 2008b). Primary power is provided to most monopole towers by the commercial power grid, but some in remote locations are powered by solar photovoltaic arrays with battery storage systems. Communication relay towers (CRTs) typically utilize a 17-kW generator. Remote video surveillance systems (RVSS) are connected to the commercial grid where available. If commercial power is not available, the towers are supplied by either a generator of up to 30-kW or a solar photovoltaic generator (USDHS, 2008b). If a commercial power grid is not immediately available when towers are deployed, primary power is supplied by a 30-kW generator with a propane-fueled motor supplied by a 2,000-gallon tank until the commercial power infrastructure is in place. Back-up power for each tower site is provided by a battery back-up system. All power lines are installed overhead from the main trunk power line to the tower site shelter and then on elevated cable trays to the tower if the primary power source is the commercial grid.

At facilities lacking communication towers, antennas are mounted on posts attached to the main building.

Most POEs are provided telephone service by a nearby telephone substation. Existing telephone lines run underground or overhead (or some combination of the two) and, when possible, follow a highway right-of-way. Most telephone lines consist of one or two T-1 lines and one to six dial tone lines. Where T-1 or fiber-optic service is not available, Internet service is accessed through telephone modems.

7.15.2.3 Fuel Supply

Propane, or natural gas, supplies fuel for heating, ventilation, and air conditioning (HVAC) systems. Fuel for emergency power generators can be propane or diesel that is stored in up to three 125-, 150-, 250-, or 500-gallon onsite tanks (USDHS, 2009m; USDHS, 2010a; USDHS, 2010d; USDHS, 2009n). Some, as is the case at the Morses Line POE in Vermont, have additional 330 gallon and 75-gallon fuel oil tanks associated with the boiler (USDHS, 2010d). Heat is generated by solar panels at the Pinnacle Road POE in Vermont, with fuel oil as a back-up. Some facilities are serviced by interconnections with commercial natural gas suppliers through underground natural gas pipelines.

Each tower that normally receives electric power from the commercial grid has a 500-gallon propane tank to fuel a back-up generator in case of power outages (USDHS, 2008b). Each 500-gallon fuel tank would be refueled every two months (USDHS, 2008b), assuming two hours of run time monthly for a generator maintenance check and other operations as needed. When commercial grid power is not immediately available upon tower deployment, primary power would be supplied temporarily by a 30-kW generator using a larger, 2,000-gallon propane tank. These larger propane tanks would be refueled approximately every seven days (USDHS, 2008b).

7.15.2.4 Wastewater Management

Urban CBP facilities such as the Rangeley and Fort Fairfield BPS are connected via municipal piping systems to wastewater treatment plants. The Fort Fairfield Wastewater Treatment Plant,

for example, treats an average of 400,000 gallons per day and serves approximately 800 accounts. It is a secondary system licensed for 600,000 gallons per day of average flow. From June to September, the plant has a monthly average biochemical oxygen demand and total suspended solids of 750 pounds per day; from September to June this average is 1,383 pounds per day (FF, 2010).

In rural locations like the Hamlin and Easton POEs in Maine, sanitary waste is disposed to onsite septic tanks. Types of septic tanks vary; some have a grinder pump, a lift station, or two venting pipes, but all are connected to the appropriate drainage mound and field or leach field. Solid waste is removed from sites by a cleaning contractor or a private disposal company. On average, septic tanks are pumped once every two years and are treated twice a year. However, those approaching capacity may need to be pumped as often as once every three months.

The state department of transportation or appropriate county-level department generally removes snow from state highways, and onsite snow removal service is contracted out to a janitor or maintenance company (USDHS, 2009d). At some POEs, facility staff uses a snow blower or tractor for snow removal (USDHS, 2009n).

7.16 ROADWAYS AND TRAFFIC

7.16.1 INTRODUCTION

The United States relies heavily on a vast transportation network to expedite the flow of goods and people to and from Canada. Providing efficient border crossing, while providing the highest level of security and safety for all motorists, is of utmost importance. Over the past decade, many land ports of entry (LPOEs) have been upgraded for highway safety, as well as technologically for ease of access. States and municipalities maintain the roadways leading to the borders to allow for tourism and trade in their areas. The following provides an overview of traffic and transportation regulations and describes the general traffic conditions for urban, suburban, rural, and remote areas.

7.16.2 AFFECTED ENVIRONMENT

7.16.2.1 Existing Roadway Network and Roadway Effectiveness

The majority of the roadways within 100 miles of the northern border within this region are secondary and tertiary paved roads, although there are some state highways throughout. Many of the areas in the New England Region are rural and remote, and some include travel destinations ranging from national parks and wilderness areas to major tourist attractions like the Maine coast.

The number of motor vehicles in the United States has been steadily increasing, with more than 254 million vehicles registered in 2009 (BTS 2012). Annual travel on U.S. roadways reached an over 2.9 trillion vehicle-miles, over three times the level reported in 1960. Travel grew about 47 percent during the 1960s, another 38 percent in the 1970s, and another 41 percent in the 1980s. Travel in urban areas in 2009 accounted for over 1.9 trillion vehicle-miles in 1996, or 66 percent of the total, compared to 44 percent in 1960 (BTS 2012a). On the rural interstate system, automobiles, light trucks, and buses account for 77 percent of average daily traffic volumes, with heavy trucks representing the remainder. Percent distribution of traffic for commercial and noncommercial vehicles in both rural and urban areas is shown in Table 7.16-1.

Table 7.16-1. Percent Distribution of Traffic by Vehicle Class, Total United States

Type of Roadway	Vehicles (%)	
	Noncommercial	Commercial
Rural		
Interstate	81.6	18.4
Other principal arterials	87.2	12.8
Minor arterial, collector and local	88.5	11.5
Rural average	86.6	13.4
Urban		
Interstate	88.2	11.8
Other freeways and expressways	90.5	9.5

Type of Roadway	Vehicles (%)	
	Noncommercial	Commercial
Other principal arterials	89.5	10.5
Minor arterials	90.4	9.6
Collectors	90.3	9.7
Local	91.0	9.0
Urban average	89.8	10.2

Source: USDOT, 1996.

7.16.2.1 Level of Service

Level of service (LOS) is a qualitative measure of the operating conditions of an intersection or other transportation facility. There are six levels of service (A through F) defined: LOS A represents the best operating conditions with no congestion, and LOS F is the worst with heavy congestion. Roadways and intersections with LOS E or F are those with traffic conditions at or above capacity. Traffic patterns are congested, unstable, and normally unacceptable to individuals attempting to access and use roadways and intersections with LOS E or F (TRB, 2000). LOS has been used to facilitate a general discussion of traffic conditions in urban, suburban, rural, and remote areas. This discussion of typical patterns for different types of roadway networks is not meant to substitute for local studies and analyses that may be required.

7.16.2.2 Variability

Traffic varies by month of the year, day of the week, and hour of the day. Often the capacity of the roadway system can be exceeded by the volume of traffic using it. This can cause breakdown flow (i.e., LOS E or F) and initiate effects that extend far beyond the time during which the demand exceeded capacity, and may take several hours to dissipate. Seasonal peaks in traffic demand are also of importance, particularly for recreational facilities.

Seasonal fluctuations in traffic demand reflect the social and economic activity of the area being served by the highway. These seasonal fluctuations typically exhibit several relevant characteristics:

- Monthly variations are more severe on rural routes than on urban routes;
- Monthly variations are more severe on rural routes serving primarily recreational traffic than on rural routes serving primarily business traffic; and,
- Daily traffic patterns vary by month of year most severely for recreational routes.

Traffic variations by day of the week are related to roadway type. Normally, weekend volumes are lower than weekday volumes for highways serving predominantly business travel, such as urban freeways. In comparison, peak traffic occurs on weekends on main rural and recreational highways. Furthermore, the magnitude of daily variation is highest for recreational access routes and lowest for urban commuter routes.

Typical hourly variation in traffic is related to highway type and day of the week. The typical morning and evening peak hours are evident for urban commuter routes on weekdays. The evening peak is generally somewhat more intense than the morning peak. On weekends, urban routes show a peak travel period that is less intense and more spread out, occurring in early to mid afternoon. Recreational routes also have single daily peaks. Saturday peaks on such routes tend to occur in the late morning or early afternoon (as travelers go to their recreational destination) and in late afternoon or early evening on Sundays (as they return home).

Traffic analysis focuses on the peak hour of traffic volume because it represents the most critical period for operations and has the highest capacity requirements. If the highest hourly volumes for a given location were listed in descending order, a large variation in the data would be observed, depending on the type of roadway.

7.16.2.3 Urban and Suburban Transportation Networks

Traffic in suburban areas is similar to that in urban areas; however, traffic delays are less of an issue unless traffic is being routed through residential areas. As with urban areas, there may be heavy traffic during rush hour, typically 7:00 to 9:00 a.m. and 4:00 to 6:00 p.m. Traffic congestion in suburban areas is normally confined to primary and secondary arterials, not residential areas. Public transportation is often provided, and traffic reports are available for updated roadway conditions.

The ability of urban streets to function well is generally limited by the capacity of signalized intersections, with traffic normally uninterrupted on roadway segments between intersections. Signal timing plays a major role in the capacity of urban streets, limiting the portion of time available for movement between intersections. Traffic conditions may vary greatly, and such factors as curb parking, transit buses, lane widths, upstream intersections, and other factors may substantially affect roadway conditions. In urban areas, LOS at critical intersections would typically be E or F during peak periods, and characterized by very unstable or forced traffic flow.

Urban streets show less variation than other areas. Most users are daily commuters or frequent users, and special event traffic is less common. Furthermore, many urban routes are filled to capacity during each peak hour, and variation is therefore severely constrained.

Traffic in suburban areas is similar to that in urban areas; however, traffic delays are less of an issue unless traffic is being routed through residential areas. As with urban areas, there may be heavy traffic during rush hour, typically 7:00 to 9:00 a.m. and 4:00 to 6:00 p.m. Traffic congestion in suburban areas is normally confined to primary and secondary arterials, not residential areas. Public transportation is often provided, and traffic reports are available for updated roadway conditions.

7.16.2.4 Rural and Remote Transportation Networks

In rural and remote areas, traffic is mainly affected by roadway conditions. Heavy traffic volumes are rare and normally only occur due to road closure and construction activities. Rural highways in the United States and Canada rarely operate at volumes approaching capacity. In addition, rural and recreational routes often show a wide variation in peak-hour volumes. Extremely high volumes occur on a few weekends or in other peak periods, and traffic during the rest of the year is substantially less, even during the peak hour. For example, highways serving

resorts and recreational areas may be virtually unused during much of the year, only to be subject to oversaturated conditions during peak summer periods.

Seasonal weather conditions are the primary cause of inefficient access on rural and remote roadways. Snow, flooding, and mudflows can make roads impassable; these events usually occur between October (when snow accumulations begin) and April (when melting snow and rains can cause flooding and mudslides). Local municipalities are prepared for maintenance of rural roadways, and residents often have alternate means of transportation, such as snowmobiles, ATVs, and horses. Remote areas, by definition, are sparsely populated, but the few residences within these areas normally have alternate transportation sources in case of emergencies. Television, radio, and NPS traffic reports are the primary sources of updates for rural and remote roadway conditions (USDOT, 2010).

7.16.2.5 Federal and State Transportation Regulations

LPOEs across the regions are accessed by a number of highways that are maintained by each state's DOT or municipal highway authority. In remote areas where trails and gravel roadways are used, it is the maintaining agencies responsibility to inform the public of road and trail closures. In the United States, each state has its own regulations and governing agency, although most regulations are similar for the purpose of uniformity. In most states, the roadway design manual is based upon recommendations in the American Association of State Highway and Transportation Officials (AASHTO) Policy on Geometric Design of Highways and Streets, commonly referred to as the "Green Book." The Green Book is not a design manual but rather a series of recommended roadway design parameters (USDOT, 2010). In addition, many Federal departments have also adopted their own traffic code for enforcement on their respective reservations (e.g., national parks and military bases). A list of the state DOTs and regulatory agencies that plan and administer the roadway design regulations is provided in Appendix S.

7.16.2.6 CBP's Activities Affecting Roadways and Traffic

CBP's activities include enforcement of customs, immigration, and agriculture regulations at U.S. borders, and CBP has primary responsibility for preventing unlawful entry into the United States while ensuring the safe and efficient flow of goods and people. For the northern border within this region, these activities are focused around the LPOEs, but construction activities, the operation of other facilities, and patrol activities have some effects to transportation resources. A general description of these activities is provided in Chapter 2. This section outlines these activities from a transportation and traffic standpoint.

Land Ports of Entry

Many different roadways including interstates, U.S. highways, state highways, and rural roadways approach the LPOEs along the northern border within this region. These cross-border access points are often colocated with towns and cities adjacent to the border, and roadways facilitate traffic approaching and departing from the LPOEs.

Vehicles entering LPOEs from Canada proceed across the border and then separate into inspection lanes. Often inspections of commercial vehicles and passenger vehicles are conducted in separate areas. These are normally parking areas for vehicles that are selected for secondary inspection, with dedicated truck lanes to help facilitate flow of larger vehicles. At some of the

larger facilities, there are committed areas for secondary truck inspections that may involve offloading and detailed examination.

As with any other roadway, cross-border traffic varies by month, day of the week, and hour of the day. Seasonal fluctuations in traffic demand reflect the social and economic activity of the area being served by the facility. Canadian traffic reaches a peak in either July or August and ebbs to a low-point in February. Summer peaks are consistently 65 to 75 percent higher than winter lows (BPRI, 2010). Normally, weekend volumes are lower than weekday volumes for LPOEs serving predominantly business travel. Monthly variations are more severe on rural LPOEs than on urban entry points. Vehicle queues are common particularly at urban LPOEs and can last for several minutes to several hours in rare cases. In general, queue length, and wait times determine the overall LOS of a LPOE from a transportation and traffic standpoint. The busiest LPOEs in the New England Region are in Table 7.16-2. A complete list of LPOEs and their level of use by transportation mode is provided in Appendix S.

**Table 7.16-2. Busiest LPOEs for Passenger Vehicles
in the New England Region**

Rank	Port Name	Annual Personal Vehicles	Annual Personal Vehicle Passengers
6	ME: Calais	890,247	1,308,679
12	ME: Madawaska	570,182	912,286
13	VT: Derby Line	552,942	1,201,768
16	VT: Highgate Springs	477,134	1,083,739
19	ME: Houlton	295,055	666,488
22	ME: Van Buren	238,319	362,246
25	ME: Fort Kent	186,552	279,543
28	ME: Eastport	150,307	238,057
29	ME: Fort Fairfield	141,495	227,781
30	ME: Jackman	125,365	325,762
34	VT: Richford	95,909	211,868
37	VT: Beecher Falls	67,181	115,575

Source: USDOT, 2009.

At LPOEs in urban areas, special lanes are used for frequent travelers and commercial vehicles with Nexpress radio frequency units for fewer delays, buses are provided for public transportation, and pedestrian walkways provided for tourists. CBP and other non-government organizations provide real-time traffic information via the internet, twitter and mobile applications (USDHS, 2010). Other technologies used to improve the functionality of LPOE are described in Chapter 2.

Vacation travel and occasional same-day shopping trips are important travel purposes along most of the border. Several Canadian and U.S. near-border cities and towns are common consumer

destinations. Vacation and same-day recreational travel are less frequent and more seasonal than consumer trips in the paired-cities model. In addition, these types of travel are highly discretionary, easily influenced by exchange rates and economic conditions (BPRI, 2010).

All LPOEs facilitate pedestrians and cyclists. However, pedestrian and bicycle circulation is infrequent at most rural LPOEs because of their remote locations and distance from residential areas. Some LPOEs have provisions for bike storage. Many LPOEs have boat and seaplane landing areas.

Transportation Checkpoints

Traffic checkpoints are conducted on roads leading from the border and consist of inspections of interior-bound conveyances, including passenger vehicles (cars, trucks, vans, and buses) and container vehicles and cargo trucks. These checkpoints provide an opportunity to detect and interdict cross-border violators that have thus far avoided apprehension. Vehicle checkpoints are generally traffic lanes temporarily controlled by CBP. Checkpoints may include support buildings to provide temporary office and holding space, as well as lights, signage, and other support equipment.

Checkpoints are established at airports for commercial aircraft and at locations along railroad lines for passenger and freight trains.

Nonroad/Offroad Activities

Traffic surveillance operations offroad can include agents stationed at specific observation points or driving predetermined routes (line watch); detection of any disturbances in natural terrain that could indicate the passage of people, animals, or vehicles (sign cutting); and road patrols. All sectors use a variety of vehicles, including four-wheel drive vehicles, sedans, scope trucks, ATVs, motorcycles, snowmobiles, and bike patrols in urban areas or over rough terrain.

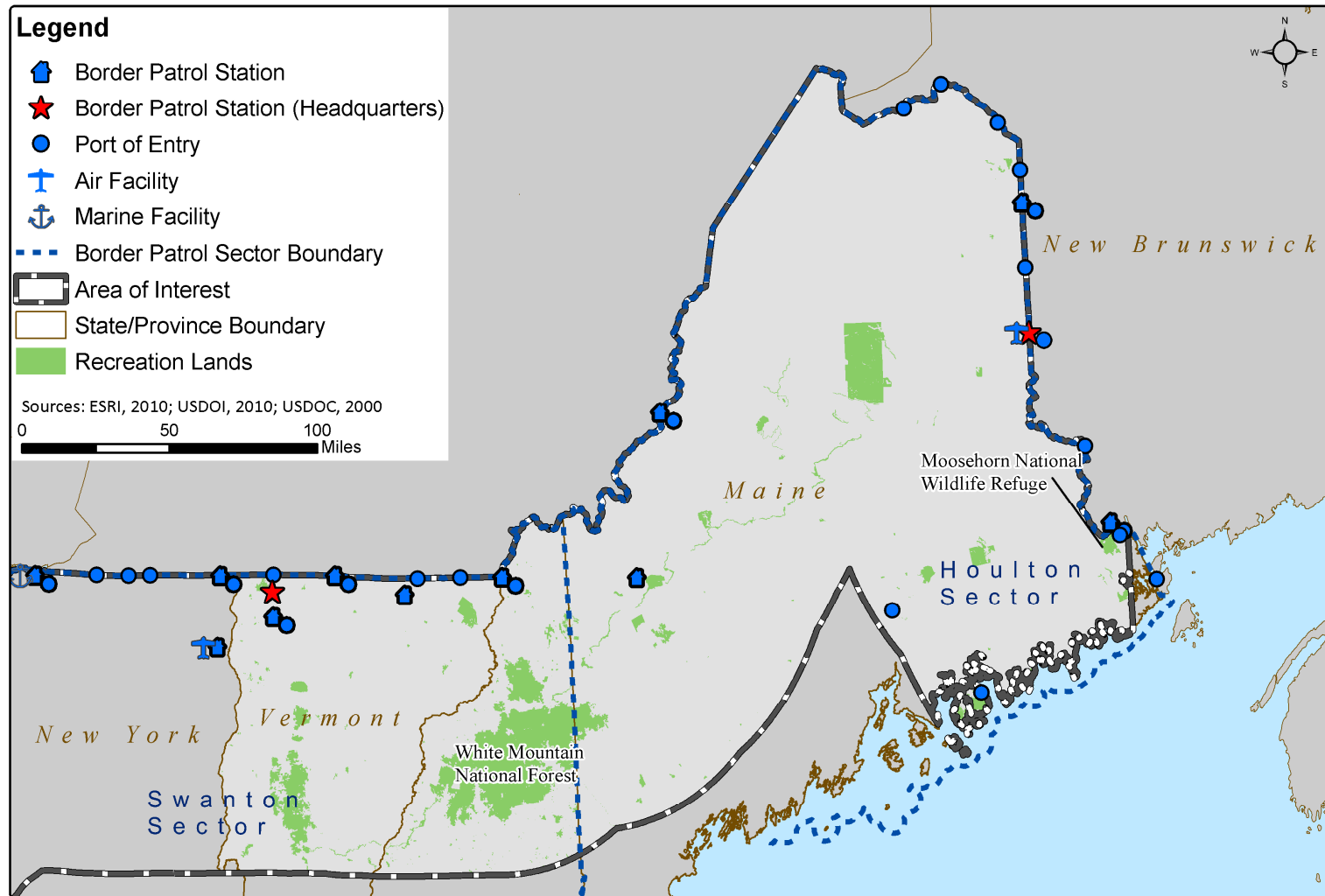
BPSs vary in size and typically include any or all of the following components: administrative and support buildings, vehicle maintenance garages, equine and canine facilities, vehicle wash facilities, fuel tanks, small arms practice ranges, undocumented alien processing and temporary holding facilities, confiscated vehicle storage facilities, and agent and visitor parking. CBP's agents use a variety of offroad transportation modes to patrol border areas. These consist of four-wheel drive vehicles, ATVs, snowmobiles, horses, and, in some sensitive habitats, agents operating on foot. As outlined in Chapter 2, CBP's activities that may affect transportation resources include UAS activities, Manned Aerial Surveillance Patrols, and other patrols.

7.17 RECREATION

7.17.1 INTRODUCTION

A wide variety of recreation areas exist along the northern border on both the U.S. and Canadian sides. On the U.S. side, recreational areas include national parks (NP), national recreation areas (NRA), national forests (NF), lakesides, national wildlife refuges (NWR), and designated wilderness areas. On the Canadian side, recreational areas include national park reserves, provincial parks, protected areas, and natural areas. U.S. recreation categories are described briefly below, since the designation bears on the nature of activities permitted. Figure 7.17-1 shows a map of federally protected recreation areas in the New England Region.

Figure 7.17-1. Federally Protected Recreation Areas, Including National Forests, Parks, Recreation Areas, and Wildlife Refuges in the New England Region



7.17.2 AFFECTED ENVIRONMENT

NPs, NFs, NWAs, NWR, and national recreation areas within the New England Region are profiled below by the impact category they most closely match. In addition to national protected areas, which are the primary focus of this analysis, many state and regional parks and protected areas along the northern border have recreation areas that could be impacted by activities along the border.

The New England Region has the fewest number of national recreation areas. One national forest sits in this area, the White Mountain National Forest, which is a medium-impact use area. The Moosehorn National Wildlife Refuge, a low-impact use area, is also in the region. Popular recreation activities include biking, hiking, skiing, hunting, fishing, and camping.

The following sections provide recreation profiles of U.S. national parks, national recreation areas, national forests, and national wildlife refuges. Appendix I contains profiles of Canadian protected areas.

7.17.2.1 Vermont/New Hampshire

Green Mountain National Forest

The Green Mountain National Forest (GMNF) is more than 400,000 acres in southwestern and central Vermont. Its setting combines rugged mountain peaks with quintessential Vermont villages and offers a variety of recreation choices for visitors. The Forest includes three nationally designated trails as well as 900 miles of multiple-use trails permitting hiking, cross country skiing, snowmobiling, horseback riding, and bicycling. The annual visitation estimate for forest visits is 2,656,000. Much of this area can be categorized as a medium-impact use area (USDA, 2009o).

White Mountain National Forest

The White Mountain NF sits in northern New Hampshire with a small amount of forest extending east into Maine. This national forest includes six Federal wilderness areas: Great Gulf Wilderness (approximately 5,552 acres), Presidential Range-Dry River (29,000 acres), Pemigewasset Wilderness (45,000 acres), Sandwich Range and Sandwich Range Extension Wilderness (25,000 and 10,800 acres), Caribou Speckled Mountain Wilderness (14,000 acres), and the Wild River Wilderness (23,700 acres). It also includes the Wildcat Brook Wild and Scenic River. Three cabins are available for rent, along with 23 developed campgrounds and three group campsites, accessible by car. Backcountry camping is also permitted. Several facilities (campgrounds, trails, etc.) are accessible for people in wheelchairs. Other recreational activities include biking, bird watching, hiking, climbing, fishing, hunting and trapping, geocaching, boating, swimming, skiing, and mountaineering. The annual visitation estimate for forest visits is 1,704,400. Much of this area can be categorized as a medium-impact use area (USDA, 2010k; USDA, 2009n).

Winter in the White Mountain National Forest



Source: USDA, 2010k.

7.17.2.2 Maine

Moosehorn National Wildlife Refuge

The Moosehorn NWR is on the upper northeast corner of Maine, on the Canadian border. The NWR covers 24,400 acres. In the park, over 50 miles of dirt roads and trails allow walking, biking, and skiing. There are also two observation decks. Regulated hunting and fishing are allowed in certain locations at certain times, but no camping or overnight parking, bicycling, or motorized vehicle use is permitted. Most of this area can be categorized as a low-impact use area(USDOI, 2010k).

Moosehorn National Wildlife Refuge contains many scenic views



Source: USDOI, 2010k.

Acadia National Park

Acadia NP is approximately 70 miles from the northern border in the lower eastern half of Maine. Visitors can access mountains, lakes and streams, wetlands, forests, meadows, and beaches along ocean within its 46,800 acres and sea level to 1530 feet range of elevations.

Animal and plant wildlife in the park inhabit a variety of ecosystems and zones ranging from sub-alpine to intertidal. Recreation opportunities include walking and hiking through forests and up mountains on 125 miles of historic trails (with or without rangers), ranger-led boat cruises, bike or horse-drawn carriage tours, and visiting historic features such as the Bass Harbor Head Lighthouse. (USDOI, 2012)

Saint Croix International Historic Site

The historic site looks onto Saint Croix Island which is the location of one of the earliest European settlements in North America. It promotes a quiet and reflective atmosphere of respect for the heroism and suffering of the French colonists in 1604–05. The interpretive trail at the mainland site features bronze figures of the French settlers and Passamaquoddy people, as well as wayside exhibits that discuss historical events and the interaction of the two cultures. A model of the 1604 French settlement sits under a shelter overlooking the island. From mid-June through mid-September, there are participatory talks about the history of the settlement led by park rangers. (USDOI, 2012)