



## Chapter 7: New England Region -Affected Environment



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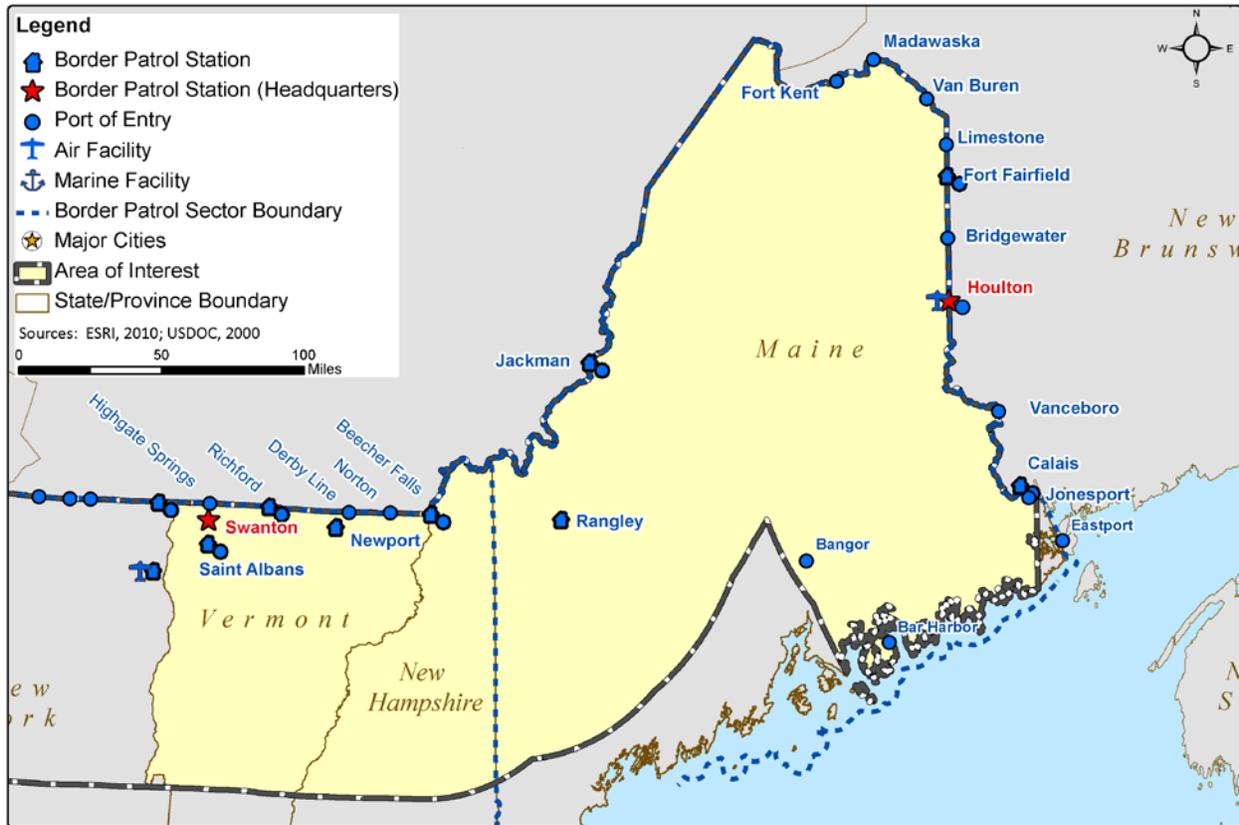
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1 **7 GREAT LAKES REGION**

2 **7.1 INTRODUCTION**

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

9 **Figure 7.1-1. The New England Region and U.S. Customs and Border Protection Facilities**



10 The Northern Border environment in the New England Region has a wide variety of habitats and  
11 terrain types.

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

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

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

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

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

#### 16 **U.S. Border Patrol in the New England Region**

17 The U.S. Border Patrol (USBP) in the New England Region employs several hundred agents  
18 who operate from 10 stations spread over approximately 700 miles of the Northern Border (see  
19 Figure 7.2-1). The border in the New England Region is mainly rural and remote, consisting of  
20 pasture land, forest, and water. The International Boundary Commission maintains a clearcut to  
21 60 feet on the U.S. side of the border (“the slash”), which defines the border wherever it passes  
22 through forest. In some areas, there are roads along the border, none of which is restricted.  
23 There are no vehicle barriers or fencing. Surveillance of the border employs diverse use of on-  
24 and off-road vehicles and snowmobiles as well as pedestrian, aerial, and waterborne patrols.  
25 CBP maintains partnerships with governmental agencies (Federal, state, and local law  
26 enforcement as well as Canadian authorities) and private entities (communities, landowners,  
27 interboundary groups) for both law enforcement and intelligence missions.

28 The region’s 10 Border Patrol stations are divided into two sectors: Houlton in Maine and  
29 Swanton in New Hampshire and Vermont. All stations have canine teams. An average of 1,000-  
30 1,500 interdictions takes place per year. Most interdictions involve people who should not be in  
31 the United States (because of criminal history, failure to leave as required, or presence without  
32 admission from Canada); there is also a small amount of smuggling. About \$2 million in cash is  
33 seized every year, usually from narcotics trafficking. Occasionally weapons and drugs are  
34 seized.

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

#### 39 **Office of Air and Marine in the New England Region**

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

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

7 The USBP manages marine operations in the New England Region.

### 8 **Office of Field Operations in the New England Region**

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

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

## 1    **7.2    A I R    Q U A L I T Y**

### 2    **7.2.1    I N T R O D U C T I O N**

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

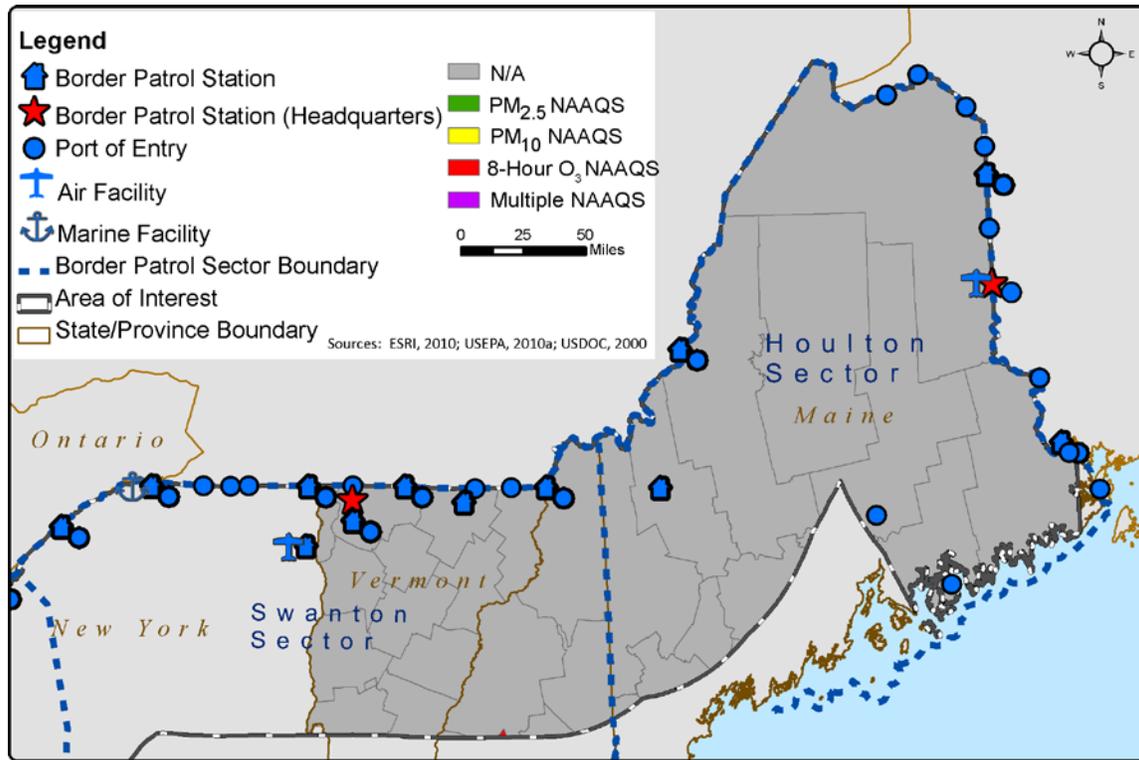
### 12    **7.2.2    A F F E C T E D    E N V I R O N M E N T**

#### 13    **7.2.2.1 National Ambient Air Quality Standards and Attainment Status**

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

1

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



2

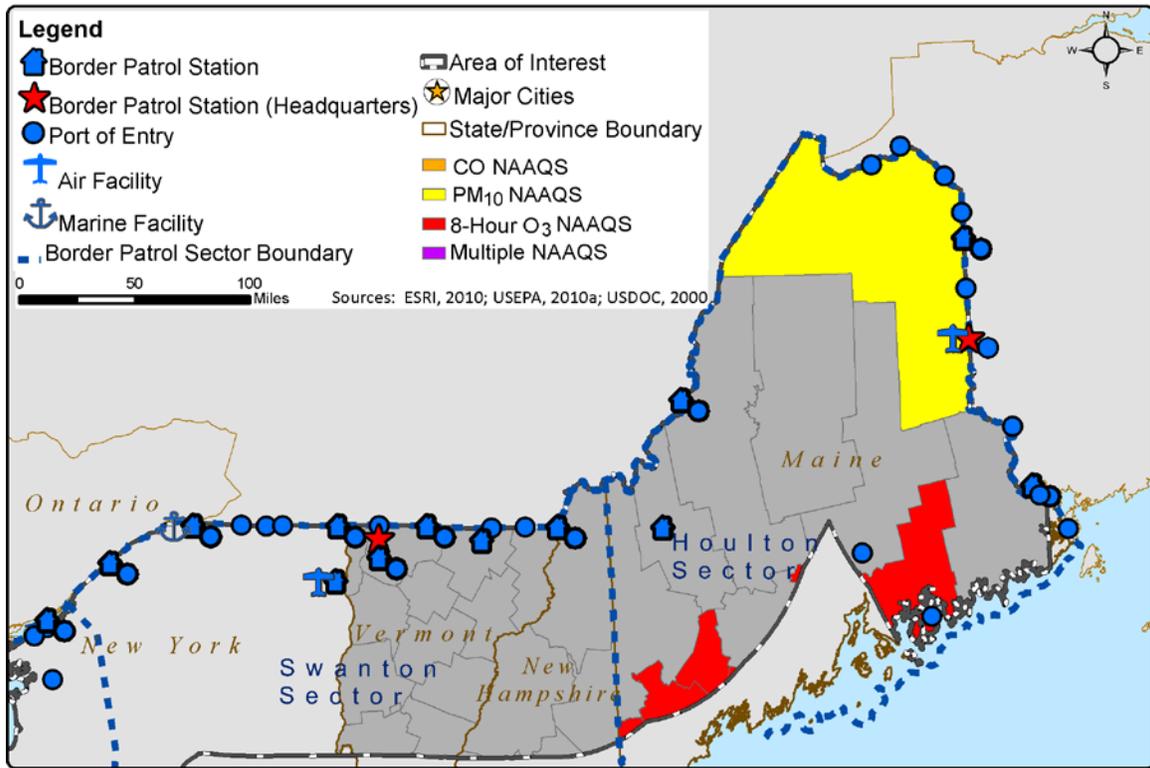
3 Notes:

4 NAAQS: National Ambient Air Quality Standards

5 PM<sub>2.5</sub>: particulate matter that is 2.5 micrometers in diameter and smaller

1

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



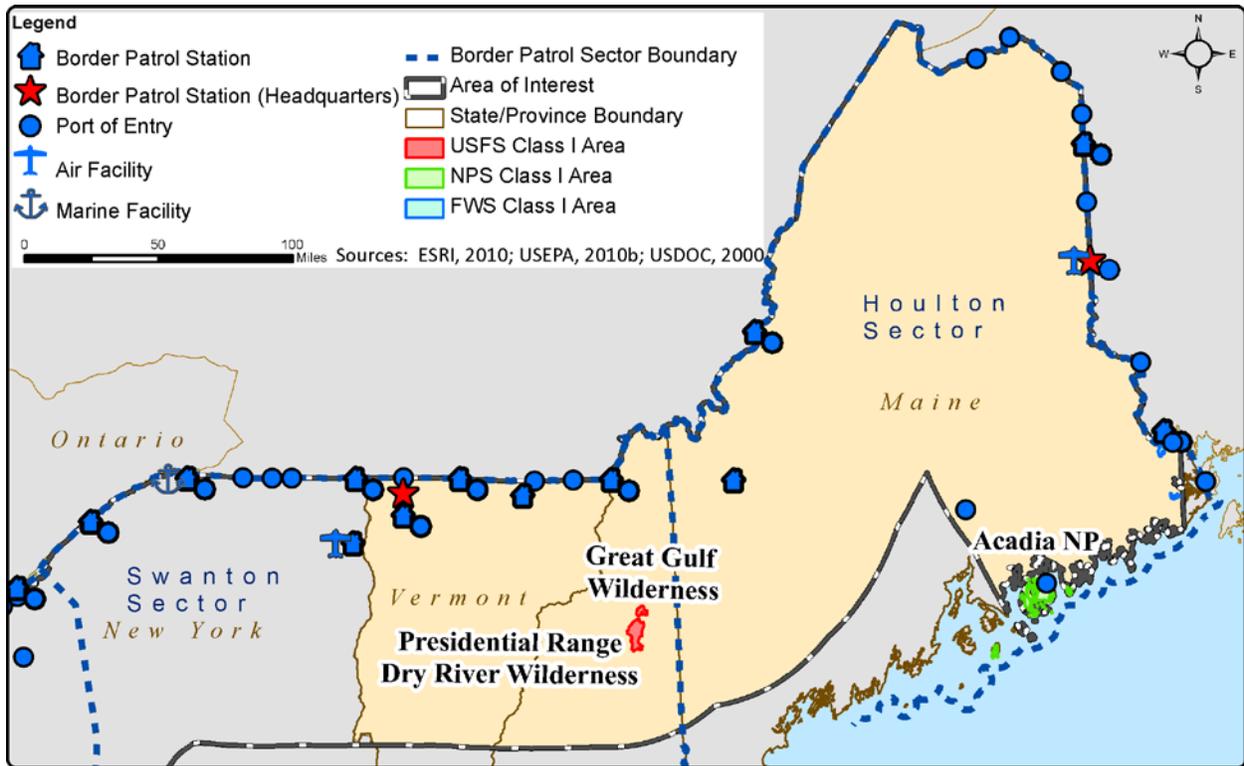
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3 **7.2.2.2 Class I Areas**

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

1

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



2

3

Notes:

4

USFS: United States Forest Service

5

NPS: National Park Service

6

FWS: U.S. Fish and Wildlife Service

7

1 **7.3 B I O L O G I C A L R E S O U R C E S**

2 **7.3.1 INTRODUCTION**

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

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

- 9 • Laurentian Mixed Forest,  
10 • Adirondack-New England Mixed Forest Coniferous Forest-Alpine Meadow, and  
11 • Eastern Broadleaf Forest (Oceanic) ecoregions.

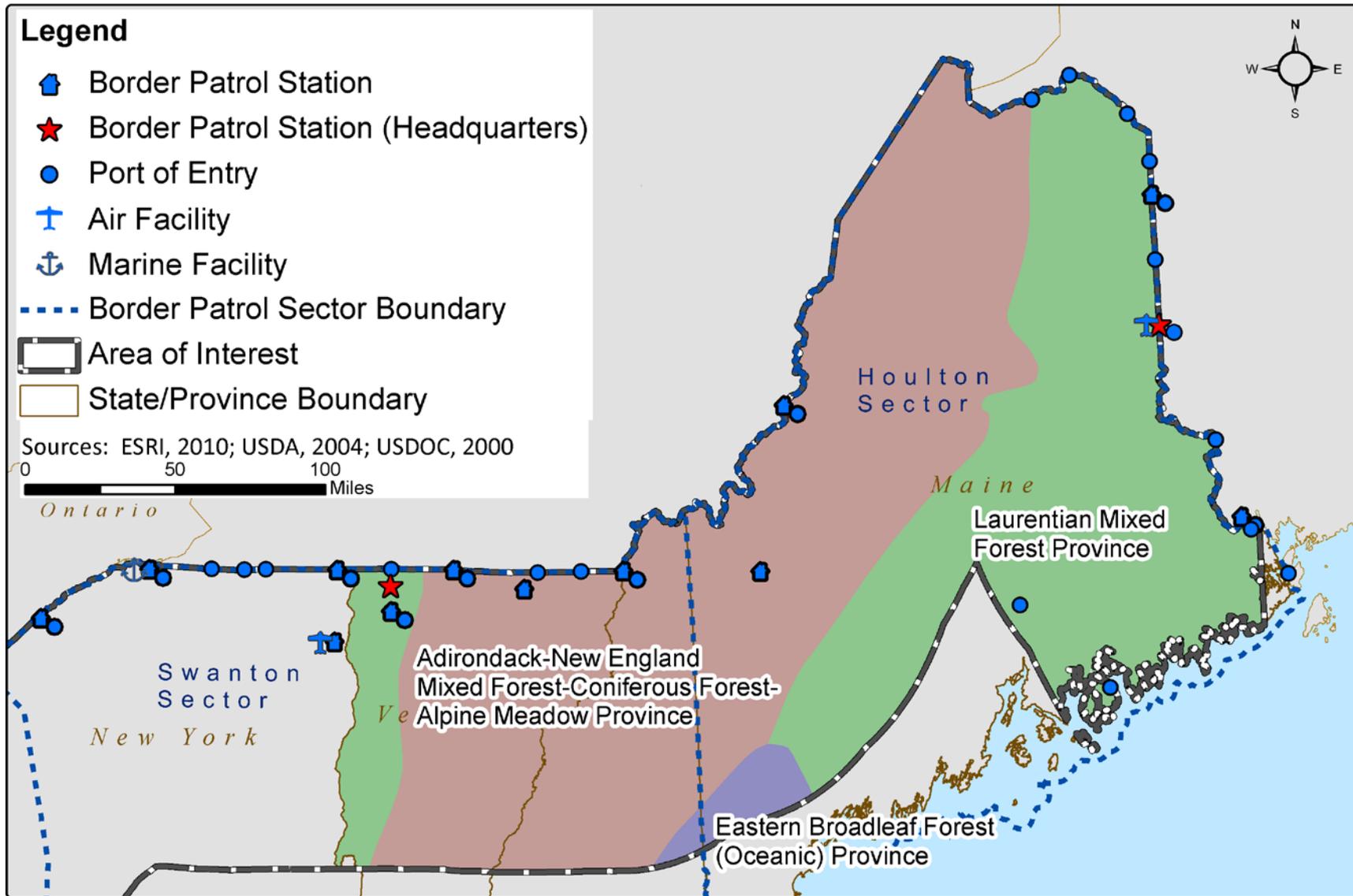
12 Figure 7.3-1 provides a map of these ecoregions. For a complete description of each ecoregion,  
13 refer to Appendix L.

14 Map resources for the ecoregion maps presented in this section were developed from the U.S.  
15 Census Bureau, USGS, and Environmental Systems Research Institute (ESRI) databases.

16 Each ecoregion has a unique set of biological, climatic, and topographical characteristics along  
17 with unique challenges and opportunities for U.S. Customs and Border Protection.

18

Figure 7.3-1. Ecoregions of the New England Region



## 1    **7.3.2   AFFECTED ENVIRONMENT**

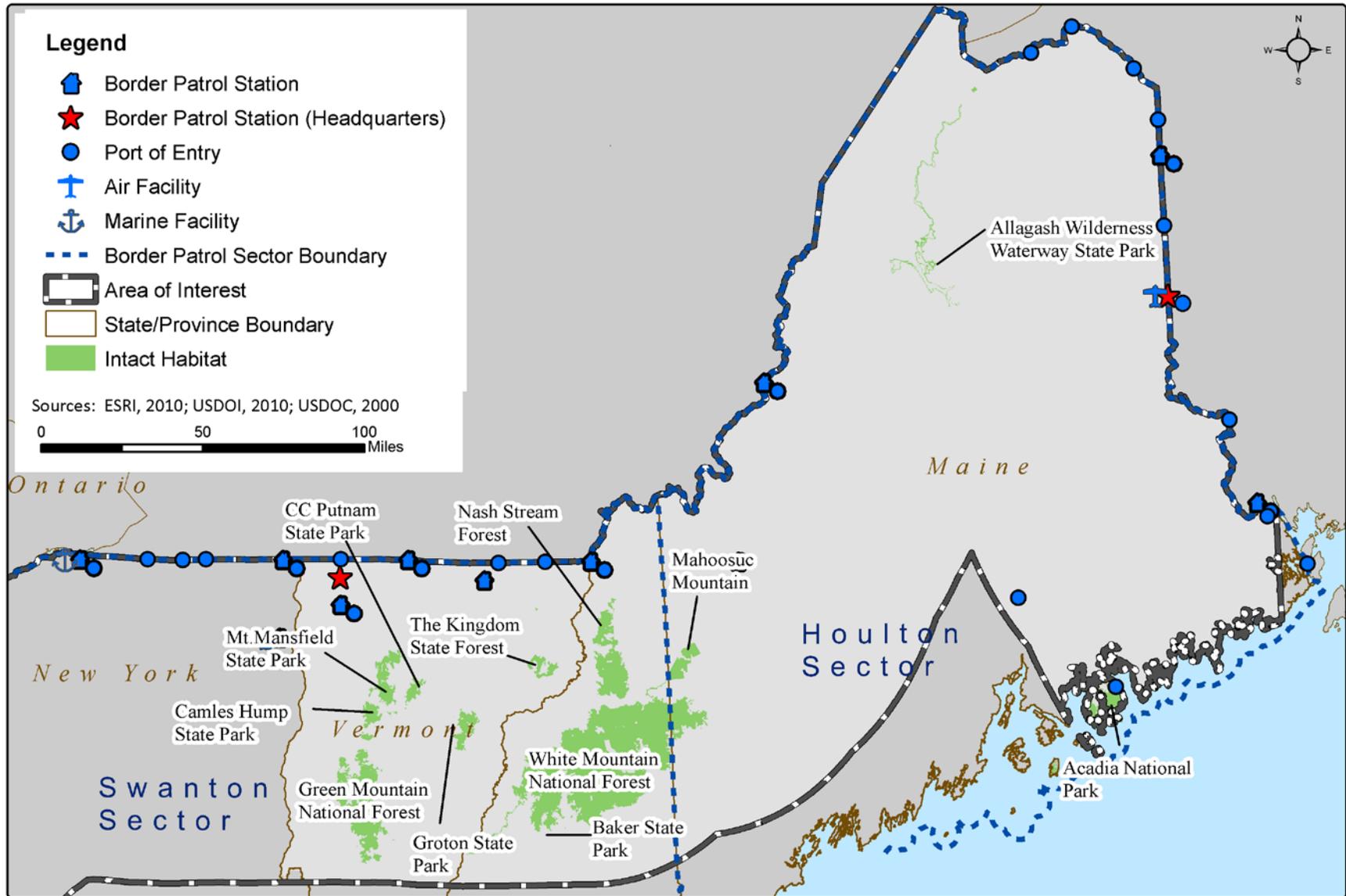
### 2    **7.3.2.1 Blocks of Regionally Significant Habitat**

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

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

- 10       • Acadia National Park (Maine)
- 11       • Allagash Wilderness Waterway State Park (Maine)
- 12       • Baxter State Park (Maine)
- 13       • Big Reed Pond Forest Preserve (Maine)
- 14       • Camels Hump State Park (Vermont)
- 15       • C.C. Putnam State Forest (Vermont)
- 16       • Great Wass Island Preserve (Maine)
- 17       • Green Mountains (Vermont)
- 18       • Groton State Forest (Vermont)
- 19       • Mahoosuc Mountains – northern extension of the White Mountains (Maine)
- 20       • Missisquoi National Wildlife Refuge (Vermont)
- 21       • Mt. Mansfield State Forest (Vermont)
- 22       • Nash Stream Forest (New Hampshire)
- 23       • Roosevelt Campobello International Park (New Brunswick, Canada)
- 24       • Silvio O. Conte National Fish and Wildlife Refuge (Massachusetts)
- 25       • Spednic Lake (New Brunswick, Canada)
- 26       • The Kingdom State Forest (Vermont)
- 27       • White Mountain National Forest (New Hampshire)

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



### 1 7.3.2.2 Sensitive Habitats

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

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

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

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

### 7 **7.3.2.3 Threatened and Endangered Species**

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

11 Appendix M lists the threatened or endangered species by county in the New England Region.  
12 Species are listed as threatened or endangered at either the Federal and/or state level; some non-  
13 threatened or endangered species are categorized as “conservation concern” or “special concern”  
14 species.

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

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

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

25 The Atlantic salmon (*Salmo salar*), is a federally listed endangered species with a range from the  
26 Androscoggin River northward along the Maine coast to the Dennys River. Impassable falls in  
27 the rivers limit the upstream extent of its freshwater range. The Atlantic salmon is an  
28 anadromous fish, typically spending 2 to 3 years in fresh water, migrating to the ocean where it  
29 spends an additional 2 to 3 years, and then returning to its natal river for spawning. Atlantic  
30 salmon in the Gulf of Maine represent the last wild populations of this fish in the United States.  
31 When listed under the ESA in 2000, at least eight rivers in the geographic range of the distinct  
32 population segment still supported wild Atlantic salmon populations (Fay et al. 2006).

1

### Atlantic salmon



2

3

Source: (Steenstra, 2010).

4

The least tern (*Sterna antillarum*) is a state-listed endangered species in this region. The least tern is a beach-nesting species that inhabits the Atlantic Coast. Breeding colonies occur along outer beaches or estuarine shorelines, situated in areas free of human activity and predators.

5

6

7

### Least tern



8

9

Source: (Maslowski, 2008).

10

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.

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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.

16

17

18

The Northern goshawk (*Accipiter gentilis*), black-billed cuckoo (*Coccyzus erythrophthalmus*), and red-headed woodpecker (*Melanerpes erythrocephalus*) are examples of the sensitive or potentially vulnerable avian species in this region, not yet protected by a Federal or state listing.

19

20

### 7.3.2.4 Wildlife Typically Found in the Region

21

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

22

23

24

1 in the New England ecoregions year-round. Other common avian species include the broad-  
2 winged hawk (*Buteo platypterus*), ruffed grouse (*Bonasa umbellus*), hermit thrush (*Catharus*  
3 *guttatus*), and blue jay (*Cyanocitta cristata*). In boreal forest and coniferous forest habitats in the  
4 northernmost portion of the region, many passerine species typical of these forested habitats  
5 occur, including more than 25 warbler species (family Parulidae), rose-breasted grosbeak  
6 (*Pheucticus ludovicianus*), and coniferous forest birds, such as black-backed woodpecker  
7 (*Picoides arcticus*) and gray jay (*Perisoreus canadensis*).

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

16 **Red spotted newt, *Notophthalmus viridescens***



17  
18 Source: (Anonymous, No Date).

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

27 **7.3.2.5 Vegetative Habitat Typically Found in the New England Region**

28 Forested habitats dominate the vegetative cover within the region. The Laurentian Ecoregion is  
29 primarily composed of coniferous and mixed forest with several species of conifers, particularly  
30 white pine (*Pinus strobus*), eastern hemlock (*Tsuga canadensis*), black spruce (*Picea mariana*)  
31 and white spruce (*Picea glauca*), balsam fir (*Abies balsamea*), and tamarack (*Larix laricina*).

1 Deciduous species become increasingly common in the mixed forest. The species assemblages  
2 within the mixed forests are highly dependent on the soils; deciduous species typically favor  
3 nutrient-rich soils, while conifers thrive in poor ones. Pines are common in areas altered by fire.  
4 Shrub and herbaceous layers add to the vegetative diversity within each of these forests (Bailey,  
5 1995; EOE, 2009).

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

14 Vegetative cover within the Eastern Broadleaf Forest (Oceanic) ecoregion includes forested and  
15 wetland habitats. Typical vegetative cover includes oak-hickory and maple-beech forests.  
16 Wetter forests often have a well-developed understory made up of flowering dogwood (*Cornus*  
17 *florida*), sassafras (*Sassafras albidum*), and hop hornbeam (*Ostrya virginiana*), along with  
18 evergreens and wildflowers (Bailey, 1995; EOE, 2009; VTDFG, 2011; NHFGD, 2011; eFloras,  
19 2011).

#### 20 **7.3.2.6 Wetlands and Waterways**

21 Wetland types within this region include:

- 22 • Beaches;
- 23 • Floodplain forests;
- 24 • Hardwood and coniferous swamps;
- 25 • Intertidal flats;
- 26 • Lacustrine wetlands (lakes);
- 27 • Marine and estuarine deepwater habitats;
- 28 • Marine and estuarine marshes;
- 29 • Palustrine emergent wetlands (marshes, fens, wet meadows, sedge meadows, wet  
30 prairies);
- 31 • Palustrine forested/scrub shrub wetlands;
- 32 • Palustrine open water (ponds);
- 33 • Riverine habitat (rivers and streams); and
- 34 • Shallow/open-water communities

35 Wetlands are those portions of the landscape where water saturation influences soil development,  
36 plant communities, and wildlife habitat. The USFWS definition of wetlands encompasses areas  
37 that are periodically inundated or saturated with groundwater or surface water, and function as

1 transition areas between uplands and aquatic habitats. Deepwater habitats, as defined by the  
2 USFWS (Cowardin et al., 1979), are permanently flooded lands below the wetland boundary in  
3 ponds, lakes, or oceans. Wetlands can be very sensitive to disturbance and have a greater  
4 likelihood of slow recovery compared to adjacent uplands. (Sheldon et al., 2003).

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

### 9 **7.3.2.7 Aquatic Resources in the Region**

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

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

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

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

36

1 **7.4 G E O L O G Y A N D S O I L S**

2 **7.4.1 INTRODUCTION**

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

8 This section addresses the geologic conditions in the New England Region and describes the  
9 potential impacts of U.S. Customs and Border Protection (CBP) program alternatives on  
10 geologic resources. The study area contains significantly different topographic features ranging  
11 from glaciated lowlands to high relief in the Appalachian Highlands to the Atlantic seaboard.  
12 Geologic formations include crystalline mountain uplifts, magma intrusions, and depressed  
13 glacial lowlands.

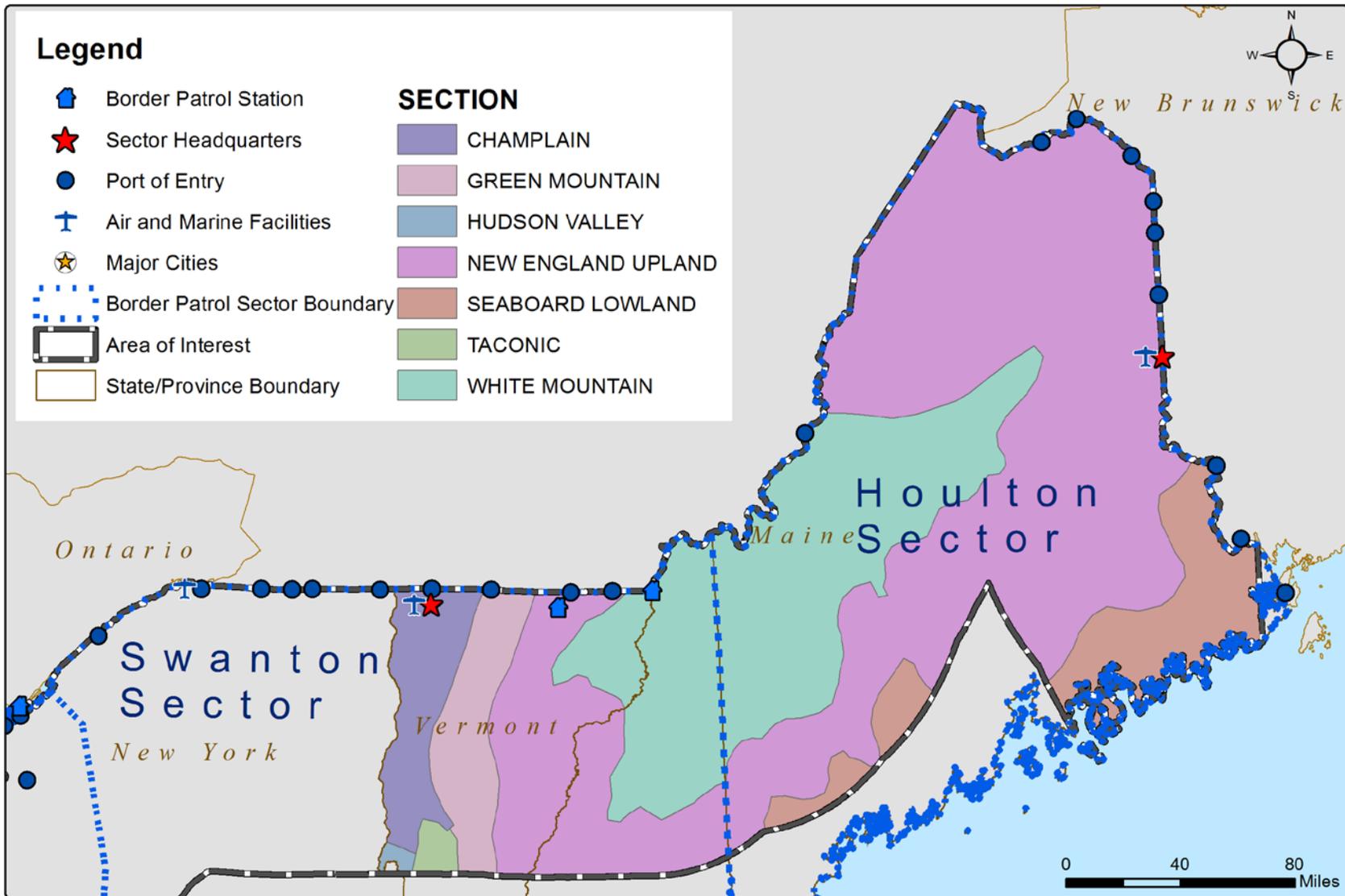
14 **7.4.2 AFFECTED ENVIRONMENT**

15 **7.4.2.1 Physiographic Provinces**

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

18 The Highlands encompass three provinces; these are further divided into sections. The St.  
19 Lawrence Province contains the Champlain section and the Valley and Ridge Province includes  
20 the Hudson Valley. The New England Province is divided into four sections: Taconic, Green  
21 Mountain, New England Upland, and White Mountains. Table 7.4-1 provides details on the  
22 geology of these areas and Appendix N features a geologic time scale showing the ages of the  
23 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.**

<b>Division</b>	<b>Province</b>	<b>Section</b>	<b>Terrain Texture including Topography</b>	<b>Geologic Structure and History</b>	<b>Generalized Rock Types</b>
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.

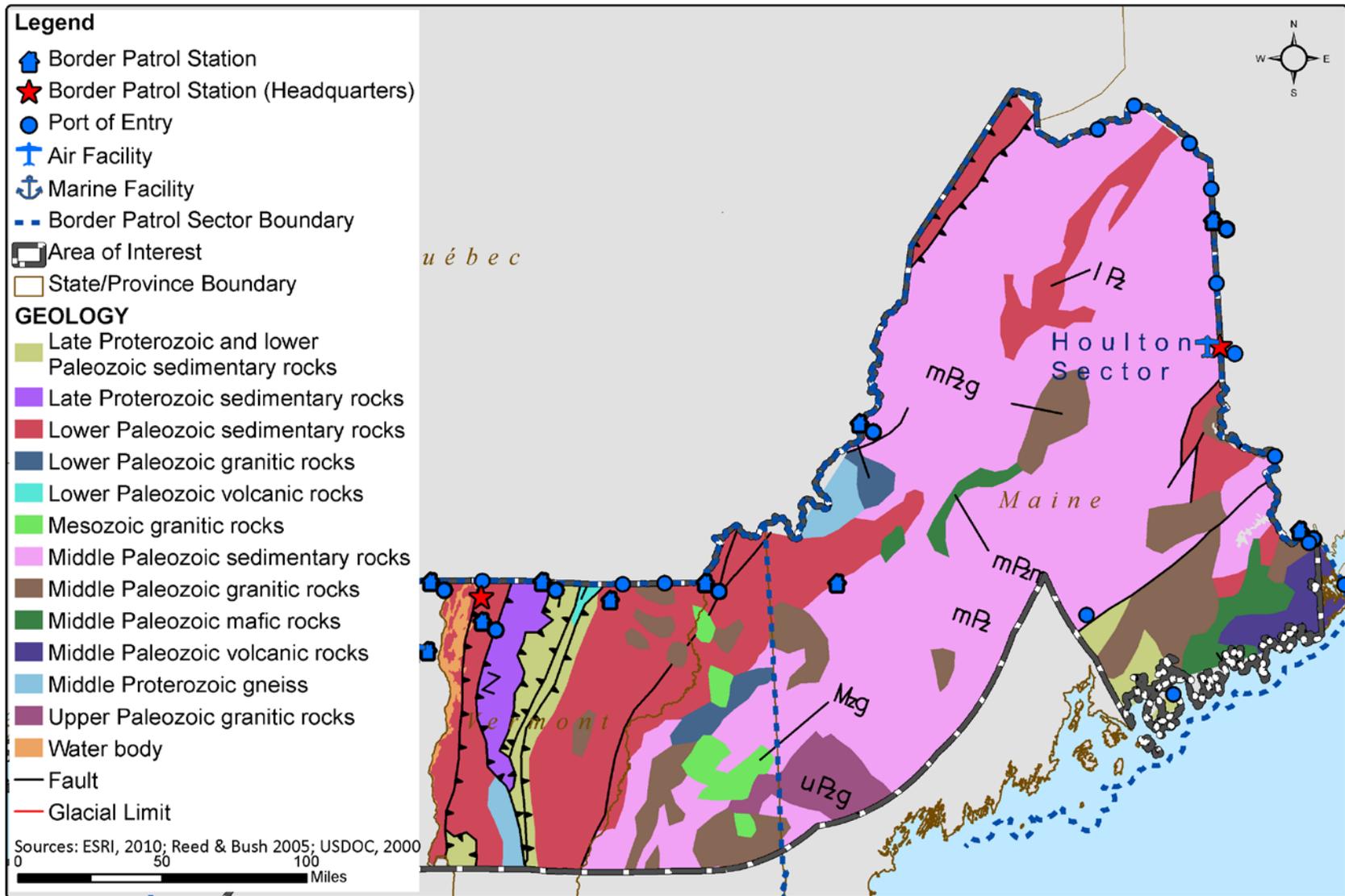
1 **7.4.2.2 Geologic Conditions**

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

9

1

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

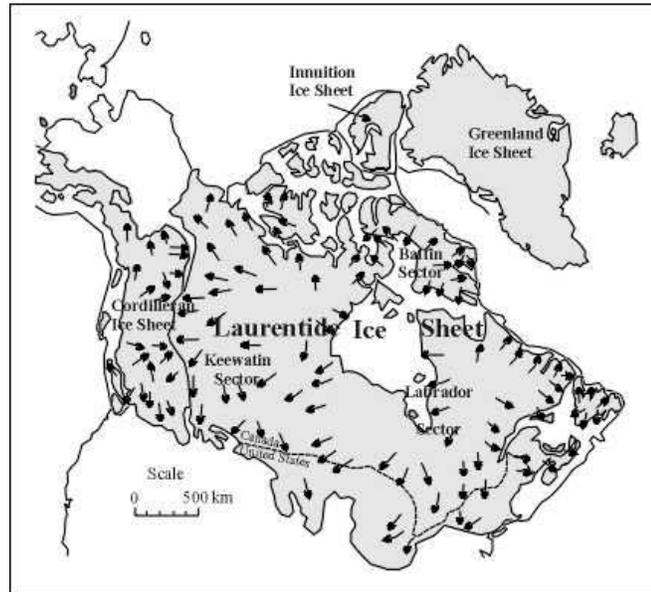


2

1 **Regional Glaciation**

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

5 **Figure 7.4-3. Extent of the Laurentide Ice Sheet**



6  
7 The effects of glacial advances are readily apparent in the northern United States. Polished and  
8 striated outcroppings, rounded hills, moraines, valley fills of glacial till and outwash, and other  
9 typical glacial features are evidence of Pleistocene glaciation. All along the Northern Border, till  
10 deposits, erratics, and moraines are common (Nelson, 2003). Till, a sedimentary deposit derived  
11 from glacial erosion, was deposited throughout the northern United States as the ice sheets  
12 receded.

13 **Seismicity and Tectonics**

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

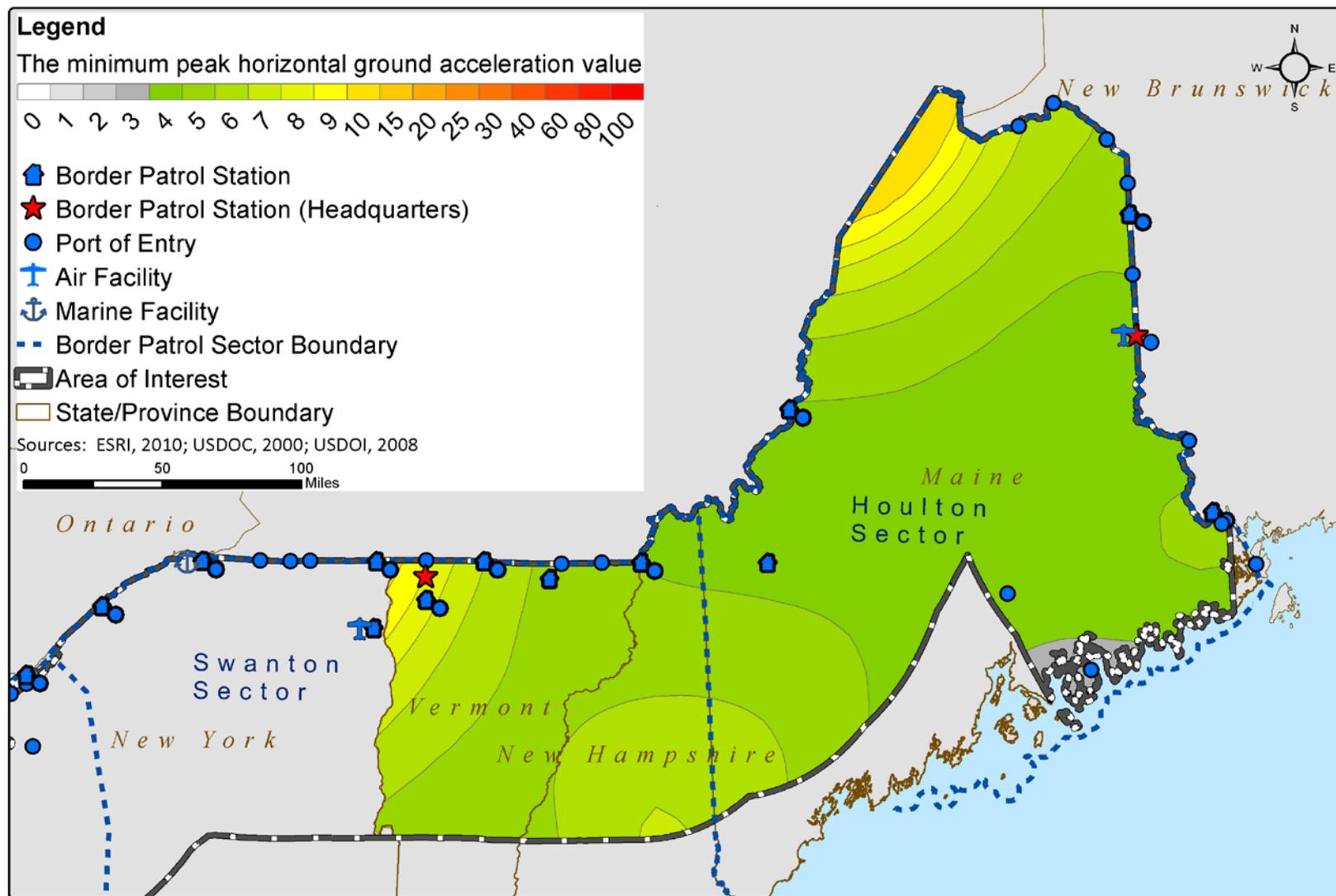
18 **Landslides**

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

21 **Karst Topography**

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

Figure 7.4-4. Seismicity in the New England Region



**Figure 7.4-5. Incidence of Landslides in the New England Region**

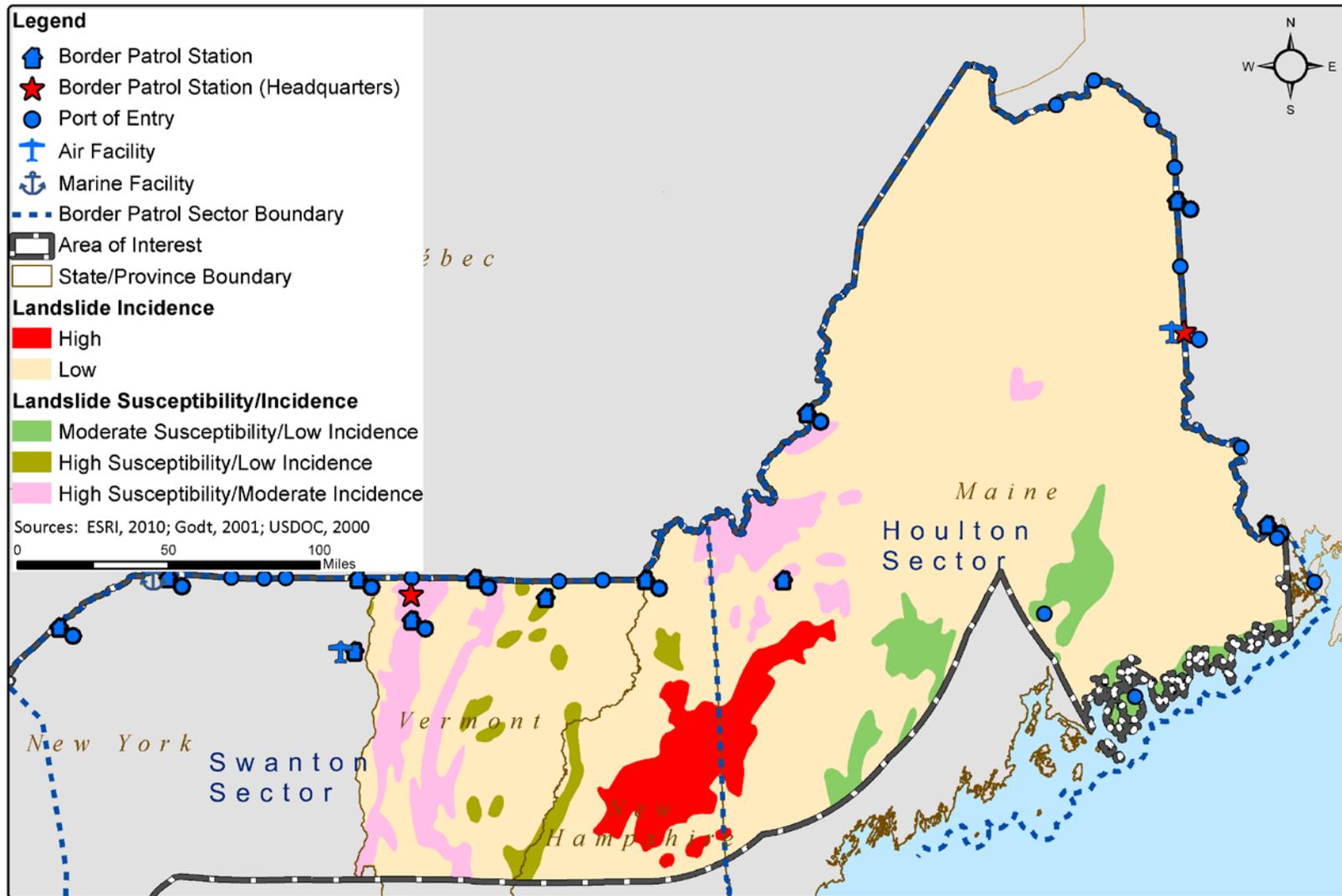
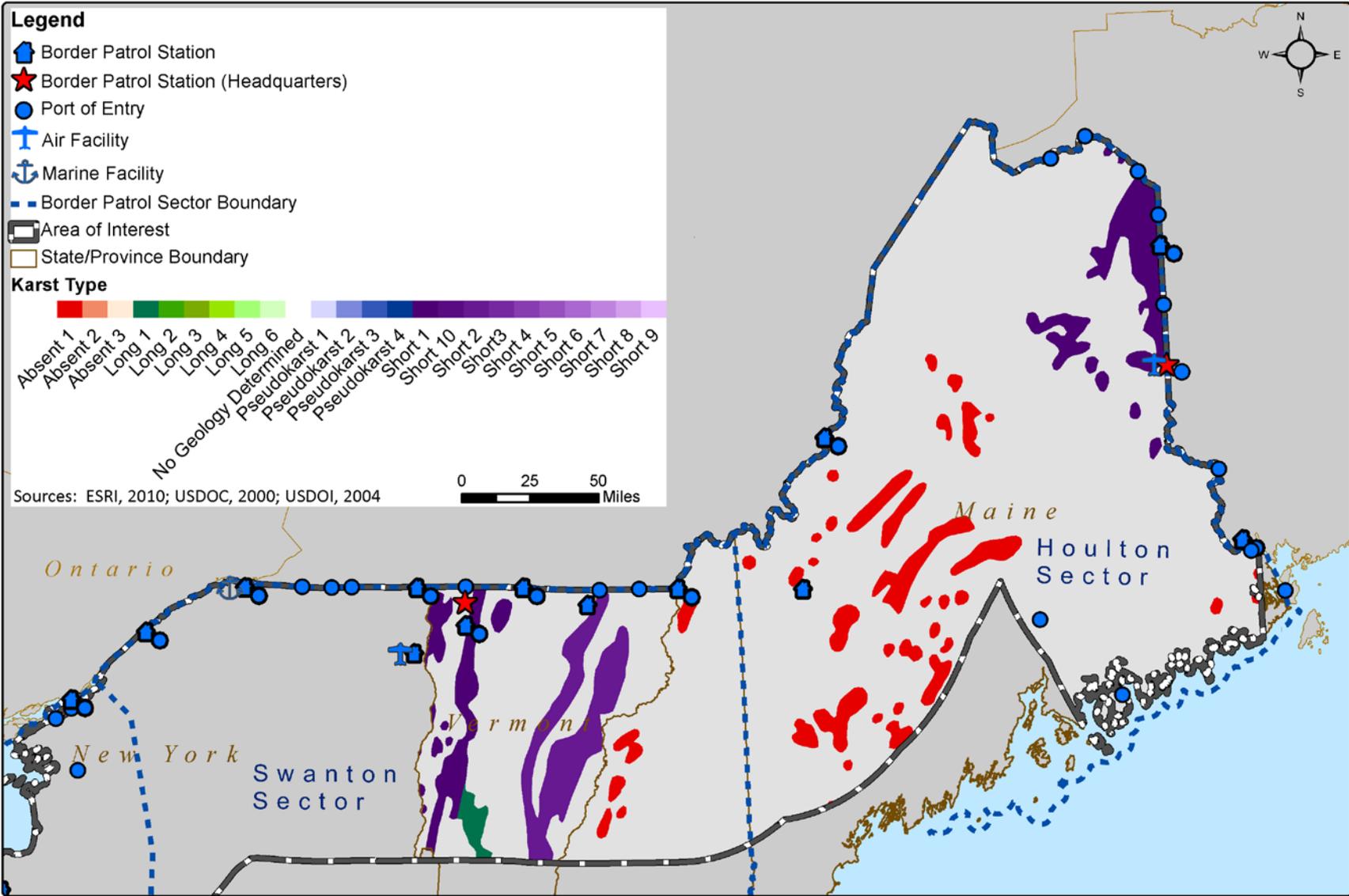


Figure 7.4-6. Karst Topography in the New England Region



1 **7.4.2.3 Soils**

2 In the New England Region, soils contain a range of particle sizes but are mainly sandy to  
3 loamy, sometimes with clay (Figure 7.4-7). Spodosols, one of the most dominant soil types,  
4 span Vermont and Maine and do not have a high erosion potential. They also are fairly acidic,  
5 and as a result are not productive without management (University of Idaho, No Date[b]).  
6 Inceptisols are the second most common soil type in the region. This soil order occurs in  
7 Vermont and Maine and has a high erosion potential. Since inceptisols develop on surfaces that  
8 have not had adequate time to develop soil profiles, they do not have extensive soil horizons.  
9 Both the lack of horizon development and location on steep slopes contribute to the high erosion  
10 potential of inceptisols (University of Idaho, No Date[a]). Alfisols also cover portions of the  
11 region, mainly along the Vermont/New York border. Since alfisols are primarily clay, their  
12 erosion potential is low (University of Wisconsin, 1999).

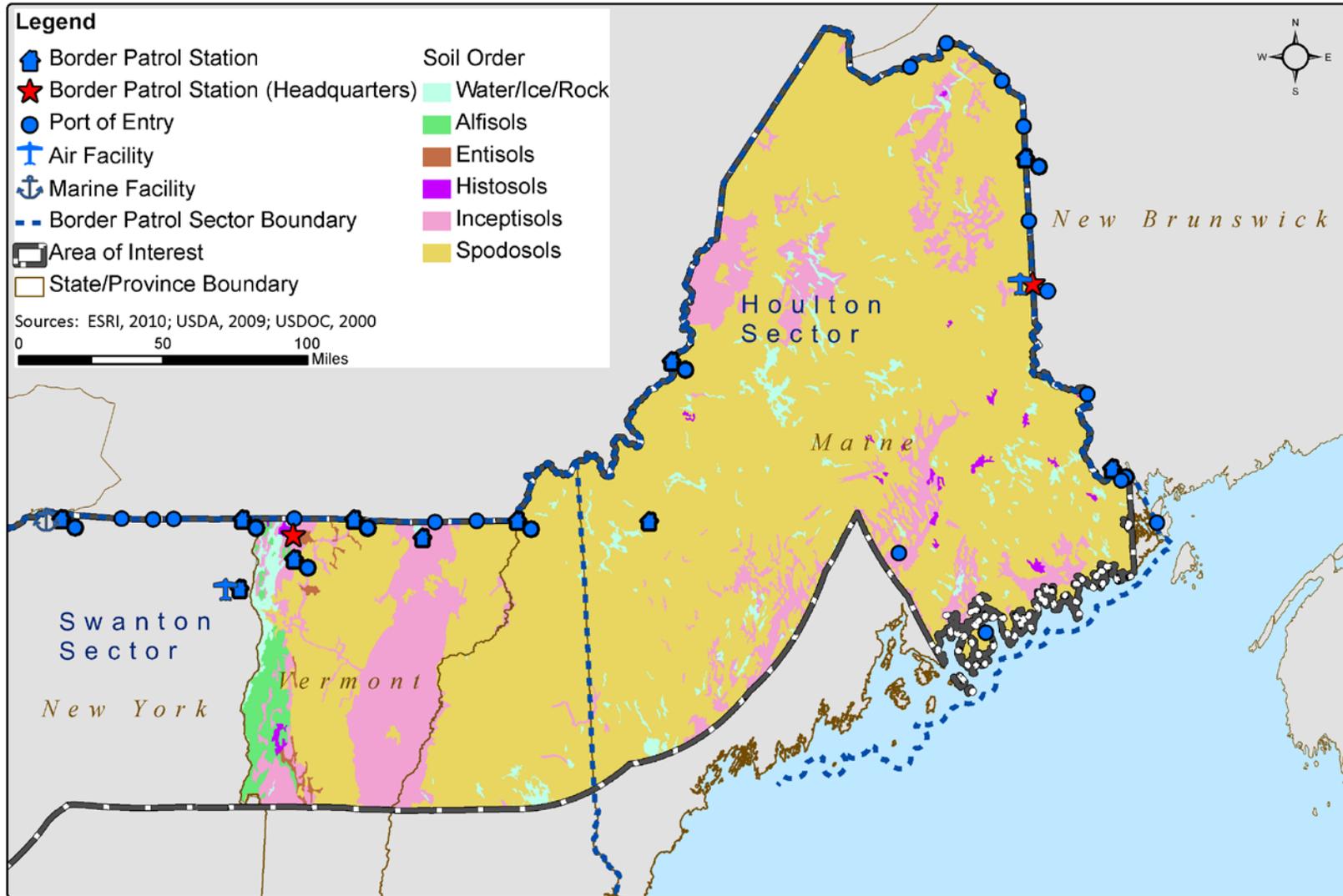
13 Histosols and entisols are the least prevalent soil orders in the New England Region. The  
14 histosols in the region are mainly found in areas of poor drainage. This water accumulation  
15 decomposes organic materials and creates peaty and mucky conditions. Histosols have a low  
16 weight-bearing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

22 **7.4.2.4 Prime and Unique Farmland**

23 In the New England Region, Prime and Unique Farmland has a maximum of 6 percent of land  
24 cover (Figure 7.4-8). Compared to other regions in the United States, the New England Region  
25 has a low percentage of designated Prime and Unique Farmland.

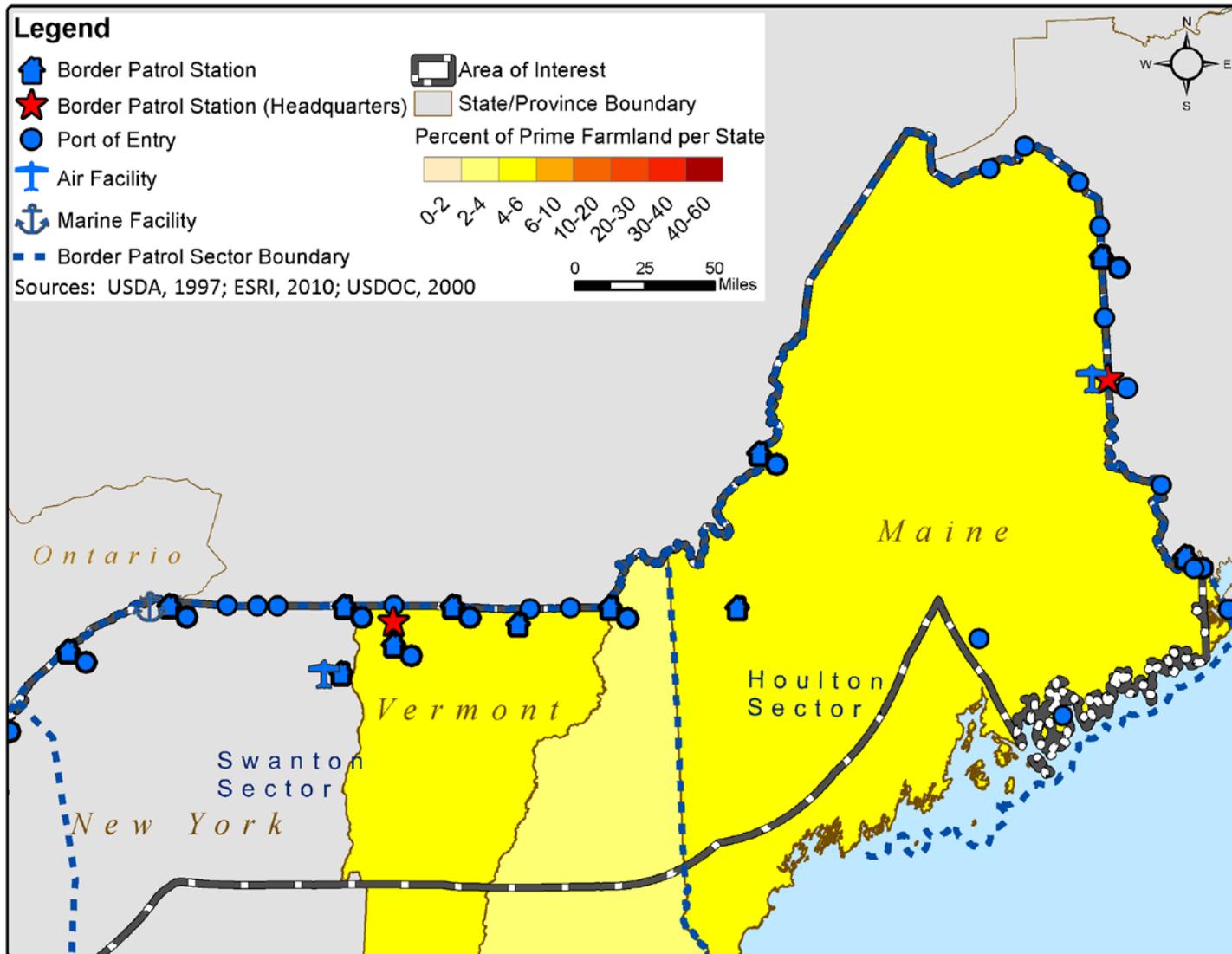
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Figure 7.4-7. Soil Orders in the New England Region



2

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



1 **7.5 WATER RESOURCES**

2 **7.5.1 INTRODUCTION**

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

11 **7.5.2 AFFECTED ENVIRONMENT**

12 **7.5.2.1 Groundwater**

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

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

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

<b>State</b>	<b>Irrigation Use (%)</b>	<b>Public Water Supply (%)</b>	<b>Industrial Use (%)</b>	<b>Rural Domestic, Livestock (%)</b>
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

23 Source: (Kenny et al., 2009).

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

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

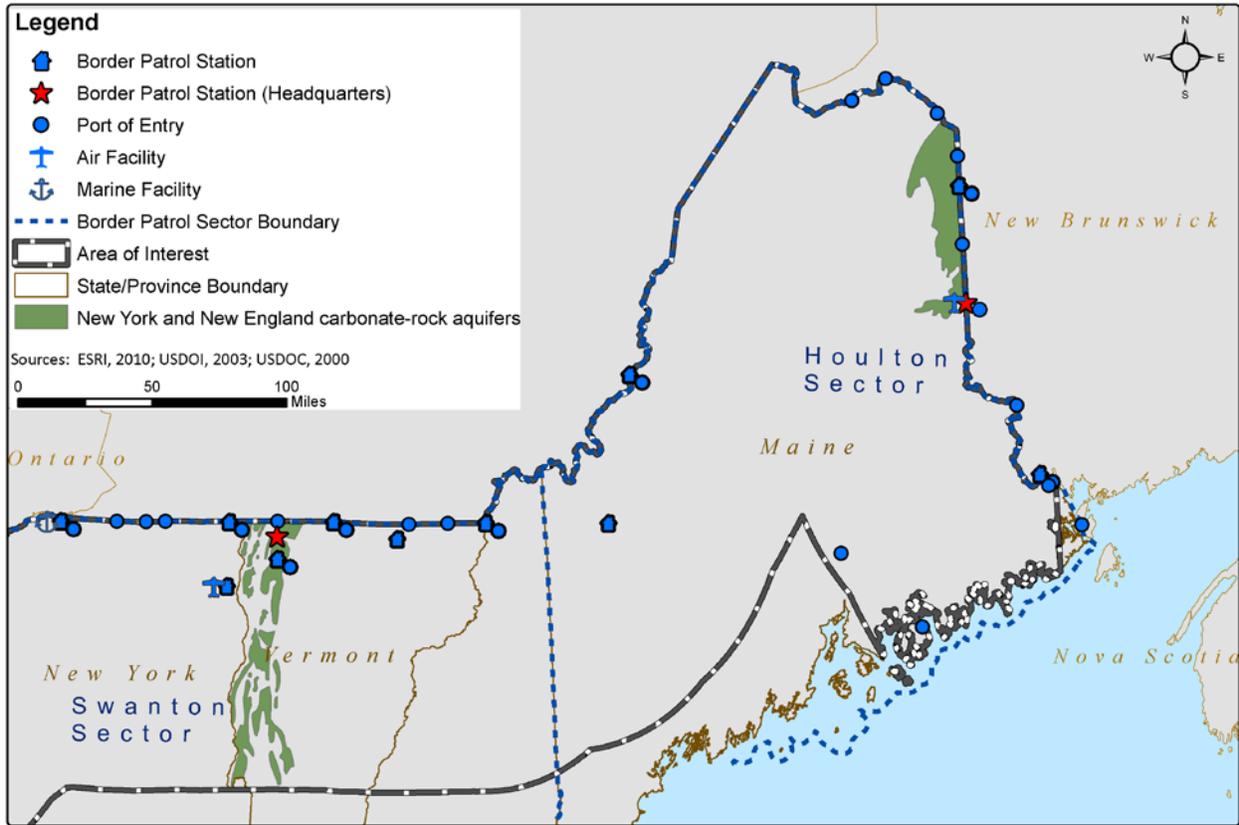
1 everywhere, this bedrock is fractured, which provides the open space through which groundwater  
2 flows (MGS, 2005).

3 Groundwater in New Hampshire is the most important source of drinking water. Approximately  
4 60 percent of New Hampshire residents rely on groundwater for their drinking water.  
5 Community water systems serve an estimated 60 percent of the state's households; over a third  
6 of this water comes from groundwater. Of the 2,177 public water systems in New Hampshire,  
7 98 percent rely on groundwater. Groundwater is also the source for the 40 percent of New  
8 Hampshire residents who rely on private water systems. Groundwater also provides an estimated  
9 40 percent of the total flow in New Hampshire's rivers, which in turn feed the state's lakes,  
10 reservoirs, and estuaries. While 85 percent of private water supply wells tap bedrock aquifers,  
11 most high-yielding public water supply wells tap stratified-drift aquifers (NHDES, 2003).

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

1

**Figure 7.5-1. New England Region Groundwater Aquifers**

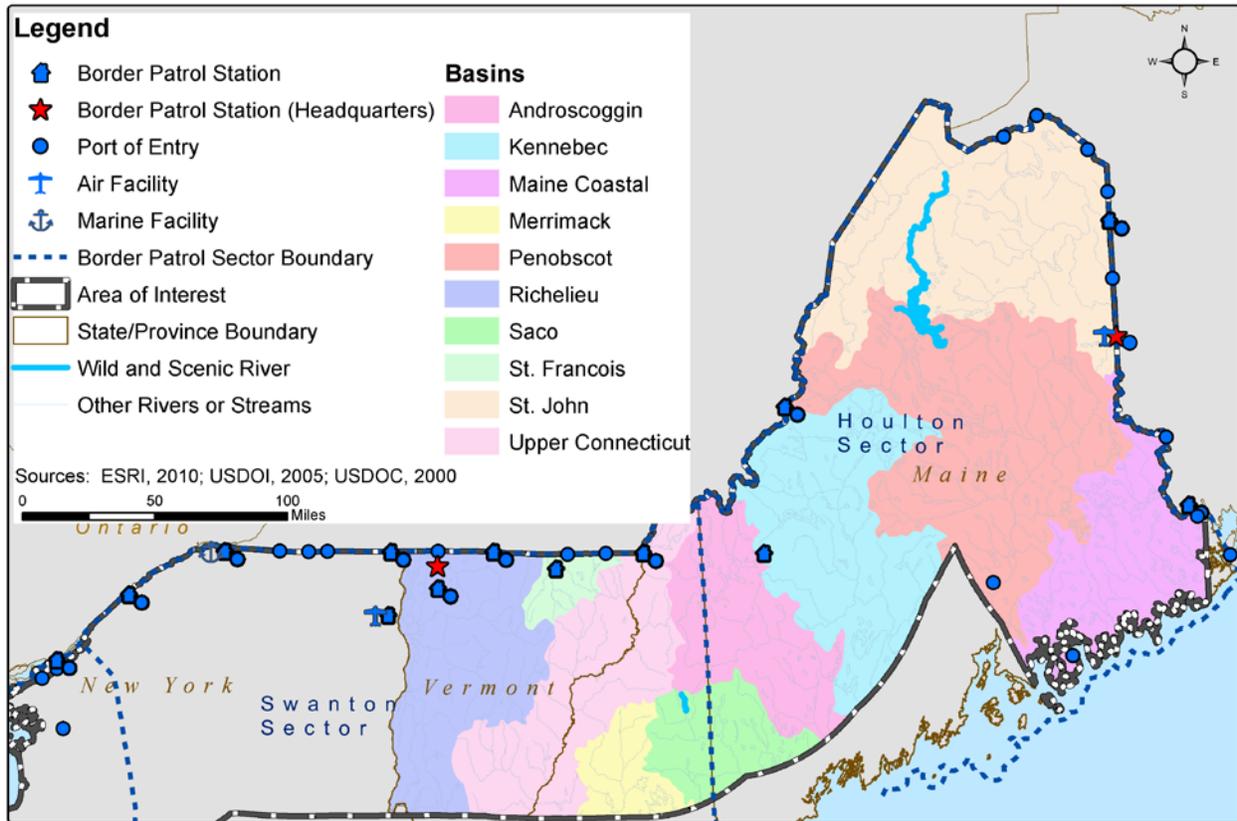


2 **7.5.2.2 Surface Waters and Waters of the United States**

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

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

**Figure 7.5-2. River Basins in New England Region**



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

9 The Penobscot River Basin drains 8,570 square miles in central Maine. The Penobscot River  
 10 flows for 105 miles from the confluence of its east and west Branches in Medway, south to its  
 11 mouth in Penobscot Bay on the Maine coast. The basin is largely undeveloped; approximately  
 12 95 percent is forested. Major communities in this basin include Millinocket, Howland, Lincoln,  
 13 Old Town, Orono, Veazie, Bangor, and Brewer (ENSR, 2007).

14 The Kennebec River Basin drains 5,900 square miles of west central Maine. The river originates  
 15 in the Appalachian Mountains at the border with Canada. The upper two-thirds of the basin are  
 16 hilly and mountainous, and the lower third of the basin has the gentle topography representative  
 17 of a coastal drainage area. Major communities in this basin include Bingham, Anson, Madison,  
 18 Norridgewock, Skowhegan, Waterville, Winslow, Augusta, Hallowell, and Gardiner (ENSR,  
 19 2007).

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

6 **Figure 7.5-3. Middle Falls along the Androscoggin River**



7  
8 The Saco River Basin drains 1,700 square miles of southwestern Maine. The river flows from  
9 the White Mountains of New Hampshire 75 miles to the mouth at Biddeford, Maine. The Saco  
10 River Basin is the largest river basin located within the Western Coastal Drainage Basin, which  
11 includes many smaller rivers draining directly to the Atlantic Ocean. Large communities within  
12 this basin include Fryeburg, Westbrook, and Kennebunk (ENSR, 2007).

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

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

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

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

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

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

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

### 18 **7.5.2.3 Floodplains**

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

### 30 **7.5.2.4 Transboundary Water Agreements**

#### 31 **The International Boundary Waters Treaty Act**

32 This treaty prohibits bulk water removal from boundary basins, requires permitting for water  
33 projects that would affect the level or flow of boundary waters, and provides sanctions and  
34 penalties for violation.

1 **7.6 N O I S E**

2 **7.6.1 INTRODUCTION**

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

11 **7.6.2 AFFECTED ENVIRONMENT**

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

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

26 **Table 7.6-1. Common Sound Levels**

<b>Outdoor</b>	<b>Sound level (dBA)</b>	<b>Indoor</b>
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

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

30 Source: Harris, 1998.

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

8 **7.6.2.1 Regulatory Review**

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

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

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

31 **7.6.2.2 CBP Noise Sources**

32 The CBP operates 24 hours a day and 7 days a week. The level of operation can be determined  
 33 by the measures required to secure the border or necessary for normal facility activities. Table  
 34 7.6-2 lists CBP's operations and describes of the noise levels of these activities.

35 **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.

Operation	Description
Firing ranges and armories	CBP conducts small-arms training at many of its ports of entry (POE) and border patrol stations (BPS). 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.

1 Source: USDHS, 2010.

2 **7.6.2.3 Non-CBP Noise Sources**

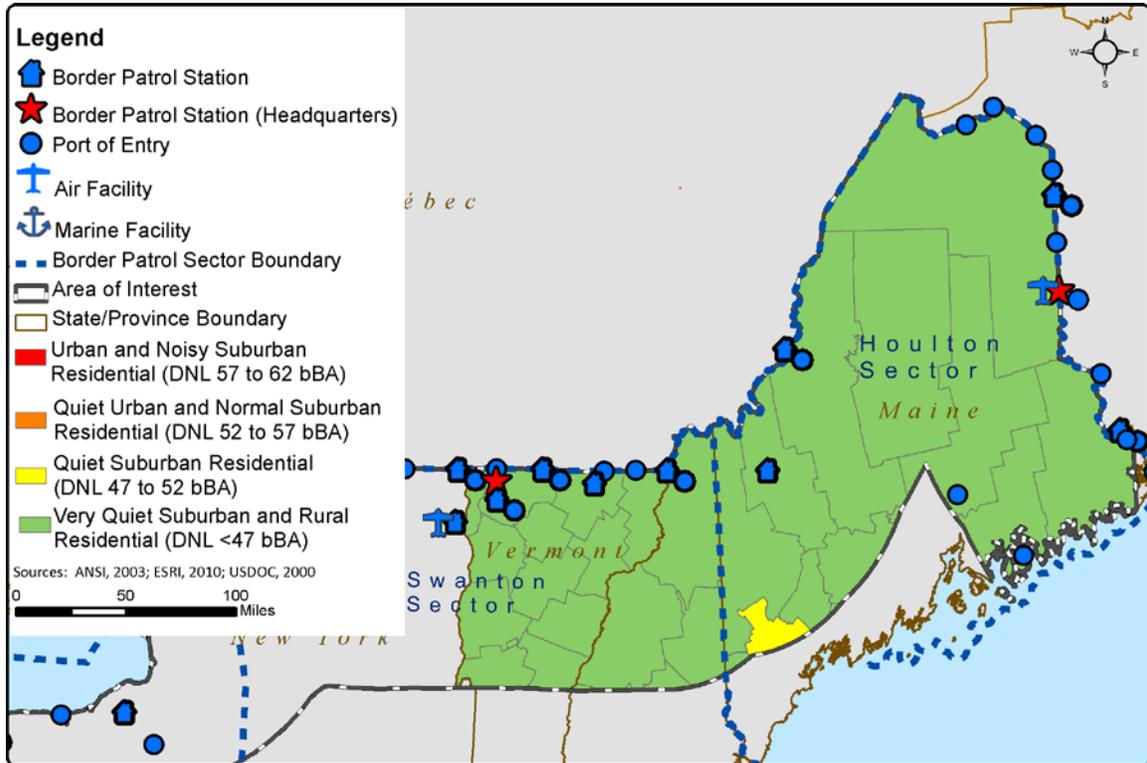
3 The sources of noise along the border in the New England Region vary greatly, although most of  
4 the region is rural or remote. Sounds dominating the rural areas are aircraft overflights, bird and  
5 animal vocalizations, and very light traffic. Farming is a major activity in some of the rural areas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

1 **7.6.2.4 Background Noise Levels**

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

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

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



9  
10

11 **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

12 Source: ANSI, 2003.

1 **7.6.2.5 National Parks**

2 The National Park Service (NPS) recognizes the natural soundscape of each national park unit as  
3 an inherent resource, and manages this resource in order to “restore degraded soundscapes to the  
4 natural conditions wherever possible, and protect natural soundscapes from degradation due to  
5 noise” (USDOJ, 2000). Non-impairment of natural soundscapes is mandated by the Organic Act  
6 of 1916 and is part of the NPS management goals and objectives. Each region of the project area  
7 has locations of special interest such as national parks. The only national park within 100 miles  
8 of the border in the New England Region is Acadia National Park in Maine, and has a total area  
9 of 47,390 acres (USEPA, 2010).

## 1 **7.7 CLIMATE CHANGE AND** 2 **SUSTAINABILITY**

### 3 **7.7.1 INTRODUCTION**

4 According to the 2009 U.S. Global Change Research Program (USGCRP) report, “Global  
5 Climate Change Impacts in the United States,” documented impacts to the Nation from climate  
6 change include increased average temperatures, more frequent heat waves, high-intensity  
7 precipitation events, sea-level rise, more prolonged droughts, and more acidic ocean waters,  
8 among others. Global and national temperature changes are not distributed evenly. Greater  
9 increases occur at the high, northern latitudes (CEQ, 2011). In 2010, the Department of  
10 Homeland Security (DHS) identified global climate change as a long-term trend and global  
11 challenge that threatens America’s national-security interests (USDHS, 2010).

12 Sustainability and smart growth are approaches to human activity that aim to meet the needs of  
13 the present without compromising the ability of future generations to meet their own needs. For  
14 U.S. Customs and Border Protection (CBP), the concepts of sustainability and smart growth  
15 include the ability to adjust to changing geopolitical realities while preserving the environment  
16 and working to improve the quality of life for American residents and visitors.

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

### 24 **7.7.2 AFFECTED ENVIRONMENT**

#### 25 **7.7.2.1 Climate Regions of the Northern Border—Overview**

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

#### 34 **7.7.2.2 Climate in the New England Region**

##### 35 **Humid Continental Climate**

36 The Humid Continental Climate is found in the interior regions of continents within temperate  
37 regions of the midlatitudes. Regions with this climate experience variable weather conditions  
38 due to their location within the midlatitudes and the year-round influence of the polar front.

1 They are located between polar-type and tropical air masses where collisions of these air masses  
2 cause precipitation from the uplift of the moist and less dense tropical air mass.

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

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

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

#### 14 *Humid Continental Climate (Warm Summer Subtype)*

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

#### 17 *Humid Continental Climate (Cool Summer Subtype)*

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

### 21 **7.7.2.3 Climate Change in the United States—New England Regional Assessment**

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

33 New England has among the lowest rates of projected future warming among regions of the  
34 United States. Within these rates, winter minimum temperatures show the greatest change, with  
35 projected increases ranging from 4 degrees Fahrenheit to as much as 9 degrees Fahrenheit (2  
36 degrees Celsius to 5 degrees Celsius) by 2100, with the largest increases in coastal regions.  
37 Maximum temperatures are likely to increase much less than minimums, again, with the largest  
38 changes in winter. The variability in precipitation in the coastal areas of New England is  
39 projected to increase (USGCRP, 2010).