ENVIRONMENTAL ASSESSMENT
FOR
HUNTING PLAN

MISSISQUOI NATIONAL WILDLIFE REFUGE
EAGLE POINT UNIT - DERBY, VERMONT

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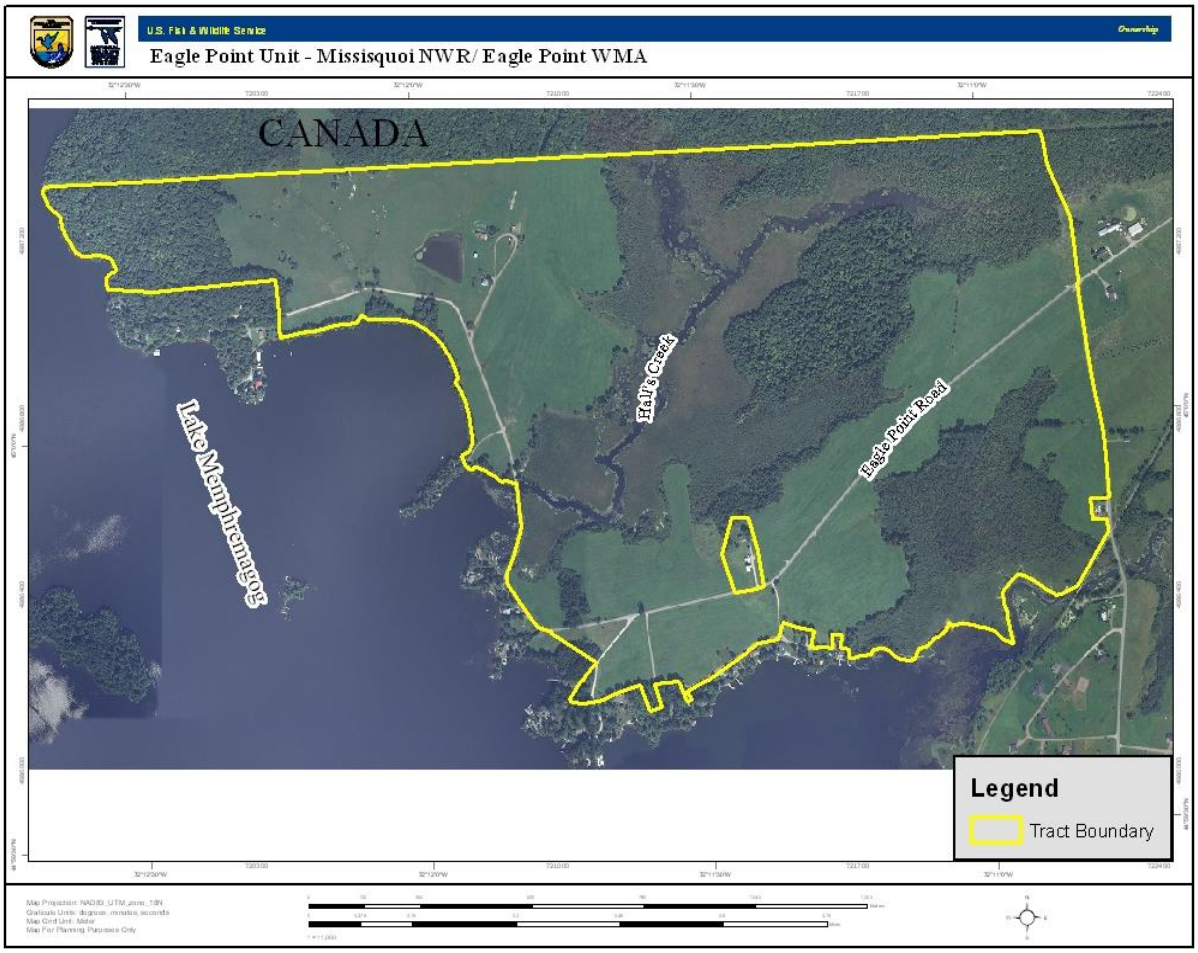
The purpose of this action is to discuss the environmental effects of a public hunting program at the 457-acre Eagle Point Unit of the Missisquoi National Wildlife Refuge (NWR, refuge), in Derby, Orleans County, Vermont. The parcel lies on the eastern shore of Lake Memphremagog at the international boundary with Canada in the Vermont Northern Piedmont Biophysical Region. This unit features lakeshore, wetlands, and uplands surrounding extensive agricultural grasslands.

I. Introduction

At the passing of Mr. Michael Dunn on September 1, 2007, the Michael Dunn Trust offered the U.S. Fish and Wildlife Service (Service) 467 acres of land, four lakefront cottages, and a farmhouse and associated outbuildings as a donation to be held "in an open state" and "available to hikers and campers." Over 420 acres of undeveloped land and lakefront contiguous to the Vermont trust property was offered to the Government of Canada and subsequently the Province of Quebec for similar purposes.

After review under Federal statutes, 457 of the original 467 acres of the property, on the United States side, was accepted on August 27, 2010, as part of the National Wildlife Refuge System (Refuge System) under partnership with the Vermont Fish and Wildlife Department (VTFW) (see Figure 1). The four cottages and associated 10 acres were retained by the Dunn Trust, to be sold separately to private owners. Due to limited resources available to the Service, the partnership with VTFW was codified in a 50-year Cooperative Agreement, so the property could be managed as a State Wildlife Management Area (WMA) (VTFW and USFWS (Draft) 2012).

Figure 1: Eagle Point Unit of Missisquoi NWR



II. Purpose, and Need, for the Proposed Action

A. Proposed Action

The Service proposes to continue hunting at the Eagle Point Unit of the Missisquoi NWR, following the State of Vermont seasons and regulations.

B. Purpose

The purpose of this action is to allow hunting to continue, uninterrupted, at the Eagle Point Unit of the Missisquoi NWR, following the State of Vermont seasons and regulations.

Hunting is a popular recreational activity in northern Vermont with a historical basis at the Eagle Point Unit. For many years, the previous landowner, Michael Dunn, allowed the public access to his property for big game, small game, and migratory bird hunting, as well as hiking and other types of outdoor recreation. Continuing the tradition of regulated hunting honors the provisions of the late Michael Dunn's Trust that requires that the property be held in an "open state" for public recreation.

Acceptance of the donation of 457 acres from Michael Dunn, by the Service, presented a unique partnership opportunity between the Service and the State of Vermont. A Cooperative Agreement between the United States Department of the Interior, U.S. Fish and Wildlife Service, and the VTFW, was signed on December 30, 2010, for wildlife conservation and management of the Eagle Point Unit of Missisquoi NWR. This document states, "Subject to the terms, conditions, limitations, exceptions, and reservations contained herein, the Service hereby authorizes the VTFW, and the VTFW hereby accepts, responsibility for the conservation, management, and administration of fish and wildlife and their habitats including any associated public recreation aspects thereof of the Eagle Point Unit…for the benefit of present and future generations of Americans."

Therefore, although the Service owns the property, the Eagle Point Unit will be managed in a manner similar to a WMA by the VTFW. The decision to accept the property as part of the Refuge System and develop a management agreement with the State was reviewed in an environmental assessment (EA) released in 2010 (USFWS 2010). The VTFW manages 85 WMAs (including the nearby South Bay and Willoughby Falls WMAs) totaling more than 118,000 acres throughout the State. WMAs play an important role in meeting the VTFW's mission for the conservation of all species of fish, wildlife, and plants and their habitats for the people of Vermont, in addition to providing access for wildlife-based activities such as hunting, fishing, trapping, and wildlife observation.

C. Need for the Proposed Action

The Service and the State of Vermont consider hunting an acceptable and desirable form of public use and wildlife-dependent recreation. Hunting is considered an educational and recreational opportunity to increase the public's awareness of wise stewardship and management of wildlife resources in the public's trust. It is one of the six priority public uses (hunting, fishing, wildlife observation, photography, environmental education, and environmental interpretation) established by Executive Order 12996 (March 25, 1996), and legislatively mandated by the Service's Refuge System Improvement Act of 1997 (Public Law 105-57).

Hunting on the Eagle Point Unit will contribute to the goals of the VTFW, "to promote sustainable outdoor recreation," and "to promote the sustainable use of Vermont's natural resources." It also will support the Service's goal to, "foster understanding and instill appreciation of fish, wildlife, and plants, and their conservation, by providing the public with

safe, high quality, and compatible wildlife-dependent public uses including hunting, fishing, wildlife observation, photography, environmental education, and interpretation."

The Service encourages the development of hunting programs on national wildlife refuges when they are compatible with the refuge's legal purpose, biologically sound, affordable, properly coordinated with other refuge programs, and fit the Service's description of a quality hunt. "Quality hunts" are defined as those which are planned, supervised, conducted, and evaluated to promote positive hunting values and ethics such as fair chase and sportsmanship. The Service strives to provide hunting opportunities on refuges which are superior to those available on other public or private lands, and to provide participants with reasonable harvest opportunities, less crowded conditions, fewer conflicts among hunters, relatively undisturbed wildlife, and limited interference from, or dependence on, mechanized aspects of the sport (USFWS 1996).

Additionally, hunting can be a valuable wildlife management tool to maintain species population levels within limits that can be supported by available habitats. In 2009, the VTFW developed a 10-year Big Game Management Plan to set specific population goals for white-tailed deer, moose, black bear, and wild turkey on the 24 Wildlife Management Units (WMU) located throughout the State of Vermont. The Eagle Point Unit represents a very small portion of WMU D1, but the harvest of species there contributes to the State's long-term wildlife population objectives.

III. Proposed Action and Its Alternatives

A. Summary of the Alternatives

The Service analyzed the impacts of two alternatives for addressing the need of a hunting program at the Eagle Point Unit of the Missisquoi NWR:

Alternative 1: (Proposed Action): Continue to hunt the Eagle Point Unit of the Missisquoi NWR, following the State of Vermont seasons and regulations.

Alternative 2: Continue to hunt the Eagle Point Unit of the Missisquoi NWR, following the State of Vermont seasons and regulations, with the exceptions of: (a) no spring turkey hunting, and (b) rifle deer hunting from a tree stand only.

The "No Action Alternative: Close the Eagle Point Unit to Hunting," was rejected (see "Section B, "Alternatives Dismissed from Consideration") since it does not honor the conditions set forth in the Cooperative Agreement signed by the Service and the VTFW. Alternatives 1 and 2 reflect management approaches based on existing wildlife populations, existing State and Federal regulations, endangered species concerns, safety considerations, and Service policies and guidance. The two alternatives represent a reasonable range as required by the National Environmental Policy Act (NEPA) of 1969.

B. Alternatives Dismissed from Consideration

Several alternatives were considered unreasonable to implement for varying reasons. These included, but are not limited to, the following:

1) Close the Eagle Point Unit to hunting (No Action Alternative). The No Action Alternative was rejected since it does not honor the conditions set forth in the Cooperative Agreement signed by the Service and the VTFW. The Cooperative Agreement allows the VTFW to manage the property similarly to a State WMA with public hunting following State of Vermont seasons and regulations. The agreement states, "Subject to the terms, conditions, limitations, exceptions, and reservations contained herein, the Service hereby authorizes the VTFW, and the VTFW hereby accepts, responsibility for the conservation, management, and administration of fish and wildlife and their habitats including any associated public recreation aspects thereof of the Eagle Point Unit…for the benefit of present and future generations of Americans." In addition, the Service and the State of Vermont consider hunting an acceptable and desirable form of public use and wildlife-dependent recreation. Hunting is an educational and recreational opportunity to increase the public's awareness of wise stewardship and management of wildlife resources in the public's trust. In addition, hunting on the Eagle Point Unit will contribute to the goals of the VTFW, "to promote sustainable outdoor recreation," and "to promote the sustainable use of Vermont's natural resources." It also will support the Service's goal to, "foster understanding and instill appreciation of fish, wildlife, and plants, and their conservation, by providing the public with safe, high quality, and compatible wildlife-dependent public uses including hunting, fishing, wildlife observation and photography, and environmental education and interpretation."

2) Open the Eagle Point Unit to hunting under regulations more conservative than those of the State of Vermont, such as restricting species that could be hunted and shorter hunting seasons for some species. This alternative was rejected since it does not honor the conditions set forth in the Cooperative Agreement signed by the Service and the VTFW. The Cooperative Agreement allows the VTFW to manage the property similarly to a State WMA with public hunting following the State of Vermont seasons and regulations. The agreement states, "Subject to the terms, conditions, limitations, exceptions, and reservations contained herein, the Service hereby authorizes the VTFW, and the VTFW hereby accepts, responsibility for the conservation, management, and administration of fish and wildlife and their habitats including any associated public recreation aspects thereof of the Eagle Point Unit…for the benefit of present and future generations of Americans." Having a different set of hunting regulations for the Eagle Point Unit would be a more expensive alternative to implement, due to the increased law enforcement personnel required to oversee and enforce them. Also, it would be confusing to the hunting public considering the area is advertised as a WMA managed by the State.

3) Open the Eagle Point Unit to hunting, with the exceptions of not allowing dogs for bear or small game furbearer hunting. Again, this alternative was rejected since it does not honor the conditions set forth in the Cooperative Agreement signed by the Service and the VTFW. The Cooperative Agreement allows the VTFW to manage the property similarly to a State WMA with public hunting following State of Vermont seasons and regulations. It states, "Subject to the terms, conditions, limitations, exceptions, and reservations contained herein, the Service hereby authorizes the VTFW, and the VTFW hereby accepts, responsibility for the conservation, management, and administration of fish and wildlife and their habitats including any associated public recreation aspects thereof of the Eagle Point Unit…for the benefit of present and future generations of Americans." Having a different set of hunting regulations for the Eagle Point Unit would be a more expensive alternative to implement, due to the increased law enforcement personnel required to oversee and enforce them.

C. Description of Alternatives

1. Regulations Common for Hunting Alternatives

Both proposed hunting alternatives for the Eagle Point Unit would follow the State of Vermont seasons, hunting regulations, and safety regulations.

The following provisions shall apply to each person while engaged in public hunting on areas of the Refuge System:

(a) Each person shall secure and possess the required State license.

(b) Each person 16 years of age and older shall secure and possess a Migratory Bird Hunting Stamp while hunting migratory waterfowl.

(c) Each person shall comply with the applicable provisions of Federal law and regulations including this subchapter and the current Federal Migratory Bird Regulations.

(d) Each person shall comply with the applicable provisions of the laws and regulations of the State wherein any area is located unless further restricted by Federal law or regulation.

(e) Each person shall comply with the terms and conditions authorizing access or use of wildlife refuges, including the terms and conditions under which hunting permits are issued.

(f) Each person must comply with the provisions of any refuge-specific regulations governing hunting on the wildlife refuge area. Regulations, special conditions, and maps of the hunting areas for a particular wildlife refuge are available at that area's headquarters. In addition, refuge-specific hunting regulations for migratory game bird, upland game, and big game hunting appear in § 32.20 through 32.72.

(g) The use of any drug on any arrow for bow hunting on national wildlife refuges is prohibited. Archers may not have arrows employing such drugs in their possession on any national wildlife refuge.

(h) The unauthorized distribution of bait and the hunting over bait is prohibited on wildlife refuge areas.

(i) The use of nails, wire, screws, or bolts to attach a stand to a tree, or hunting from a tree into which a metal object has been driven to support a hunter is prohibited on national wildlife refuge areas.

(j) The use or possession of alcoholic beverages while hunting is prohibited.

(k) You may possess only approved nontoxic shot while in the field, which we identify in 50 CFR 20.21(j), while on a WPA (*note*: Eagle Point is not a WPA) or on certain other areas of the Refuge System as delineated on maps, leaflets, and/or signs available at each refuge headquarters or posted at each refuge or as stated in refuge-specific regulations. Where we allow turkey and deer hunting, you may use slugs and shot containing lead to hunt these species unless prohibited by refuge-specific regulations and/or State law.

(l) The refuge-specific regulations (§ 32.20 through § 32.72) may include the items discussed in § 32.3(b). Refuge permits and brochures should also include those items and any special conditions allowed by paragraph (f) of this section.

Refuge-Specific Regulations:

A. Unarmed hunters may scout open hunting areas before a particular season opens but in no case before September 1. We do not require a hunting permit for scouting.

B. The following activities are prohibited on the Eagle Point Unit of the Missisquoi NWR:

- Littering.
- Spotlighting of using artificial light to locate wildlife.
- Shooting for target practice.
- Using or possessing alcoholic beverages while hunting.
- Driving or screwing a nail, spike, or other metal object into a tree or hunting from any tree into which such an object has been driven.
- Taking wildlife or plants, including cutting trees or brush, other than as specified in 10 V.S.A. App. § 15 (Rule governing public use of Vermont Fish and Wildlife Department Lands).
- Searching for or removing any object of antiquity, including arrowheads, pottery, or other artifacts.
- Using motorized vehicles in hunting areas, except for access by mobility impaired hunters as permitted.

- Fires.
- Camping, except for use of the designated campsite while paddling the Northern Forest Canoe Trail.
- Permanent blinds and tree stands. Refer to 10 V.S.A. App. § 15 and10 V.S.A. § 4907.
- Unattended decoys.

2. Alternative 1. (Proposed Action): Continue to hunt the Eagle Point Unit of the Missisquoi NWR, following State of Vermont seasons and regulations.

Under this alternative, the Eagle Point Unit would continue to be open to hunting according to the State of Vermont's seasons and regulations. General exceptions to the State's regulations are discussed below:

- All dog training activities which fall outside the regular State hunting seasons (June 1 to August 1 and during rifle deer season annually) will be allowed only through the Special Use Permit (SUP) process. Permits must be requested in writing to the refuge manager at the Missisquoi NWR.

3. Alternative 2. Continue to hunt the Eagle Point Unit of the Missisquoi NWR, following State of Vermont seasons and regulations, with the exceptions of: (1) no spring turkey hunting, and (2) deer hunting from a tree stand only.

Under this alternative, the Eagle Point Unit would continue to be open to hunting according to the State of Vermont's seasons and regulations. General exceptions to the State's regulations are discussed below:

- Spring turkey season will be closed on the Eagle Point Unit. This exception addresses concerns raised by the public regarding safety during periods of higher use for other forms of recreation on the refuge.

- All dog training activities which fall outside the regular State hunting seasons (June 1 – August 1 and during regular deer season annually) will be allowed only through the Special Use Permit process. Permits must be requested in writing to the refuge manager at the Missisquoi NWR.

- Hunting with a rifle will be permitted from a portable tree stand only. This exception is designed to address public safety due to the small tract size of the Eagle Point Unit and the abundance of open fields and wet meadows where hunting will be permitted.

IV. Affected Environment

The physical environment of the Eagle Point Unit of the Missisquoi NWR has been fully described in the *Eagle Point WMA at Missisquoi National Wildlife Refuge Long Range Management Plan* (LRMP) (VTFW and USFWS (Draft) 2012) and the *Final Environmental Assessment, Missisquoi National Wildlife Refuge Eagle Point Unit (Proposed Donation of the Dunn Property)* issued by the Service in 2010 (USFWS 2010). These descriptions are incorporated by reference, with the affected resource areas summarized here. The scope of the analyses and discussion is limited to vegetation, wildlife populations, local economy, and cultural resources which were determined to be the resources impacted by a hunting program.

A. Vegetation

The Eagle Point Unit of the Missisquoi NWR is located in the Northern Vermont Piedmont biophysical region that extends into Canada, and is located between the northern Green Mountains to the west and the northeastern highlands to the east. The region is characterized by rich soils derived from calcium-rich bedrock, and is known for its rolling hills, forest and fen communities, scattered ponds, wetlands, and lakes, as well as its agricultural land. Despite the high latitude, the broad valleys in the Northern Vermont Piedmont have a relatively mild climate with a growing season of about 130 days near Lake Memphremagog. Annual precipitation is around 40 inches, which is below average for Vermont, but fairly typical for a larger valley in the State (USFWS 2010).

A long history of agricultural use continues to influence the distribution of natural communities at Eagle Point. Although a hemlock-northern hardwood forest was likely the dominant historical community there, the unit now contains a varied landscape with agricultural lands, small remnant forest patches, and diverse wetlands. Eleven natural community types were identified on the 457-acre unit, and are fully described in the LRMP (VTFW and USFWS (Draft) 2012).

Five forested upland community types on the property include: hemlock forest, along the shoreline of Lake Memphremagog; hemlock-northern hardwood forest containing a mix of hemlock, yellow birch, sugar maple, and white ash; lakeside floodplain forest that experiences inundation when the lake level rises each spring; northern hardwood forest having large sugar maples, with yellow birch, paper birch, white ash, and quaking aspen as the secondary understory; and northern white cedar sloping seepage forest. Approximately 150 acres of wetlands, consisting of alder swamp, red maple-northern white and cedar swamp, sweet gale shoreline swamp, seep, deep broadleaf marsh, and a 30-acre intermediate fen of Statewide significance, also occurs there. All water on the Eagle Point property drains into Lake Memphremagog (VTFW and USFWS (Draft) 2012).

B. Hydrology, Water Quality, and the Lake Memphremagog Shoreline

The Eagle Point Property includes over 1 mile of frontage on Lake Memphremagog. The lake and its watershed sustain a diversity of fish and wildlife species and habitats, and support significant summer and winter recreational use which add to the economies of northeastern Vermont and the Eastern Townships of Quebec. A cooperative effort between Vermont and Quebec seeks to address lake and watershed management issues with the goal of improving and protecting this spectacular natural resource.

Lake Memphremagog is 25 miles long with 73 percent of the lake's surface area in Quebec. Three-quarters of its watershed, however, is in Vermont. The watershed in Vermont is largely agricultural and forest land, with residential development increasing in recent years in both Vermont and Quebec. Like many other lakes, Memphremagog is impacted by accumulating phosphorus, sediments, and other pollutants from a variety of sources. In addition, exotic species infestations are a concern, with an existing Eurasian water milfoil population and the potential for a zebra mussel infestation.

In 1989, the Quebec/Vermont Working Group on Managing Lake Memphremagog and its Environment was formed to study the principal problems related to the management of the lake's water quality. The Working Group issued its final report in 1993, and an international committee, the Quebec/Vermont Steering Committee, has pursued implementation of the report's recommendations.

To help prevent the introduction of zebra mussels, eight boat washing stations have been installed around the lake. A water quality monitoring effort has been initiated to record long-term conditions in the lake and to guide future discussions about compatible water quality standards. Increased funding has enabled farmers to install best management practices on their farms. The Environmental Protection Agency (EPA) and U.S. Department of Agriculture (USDA) have authorized $260,000 to supplement existing cost-share programs. In 1994, the Lake Memphremagog Watershed Association was formed to bring together citizens interested in lake and river issues in the basin.

The Eagle Point property includes over 1 mile of shoreline on Lake Memphremagog, in three main areas: a densely forested patch approximately 1,148' (0.2 mi.) long in an undisturbed condition northwest of Eagle Point and extending to the Canadian border; approximately 2,660' (0.5 mi.) of shoreline comprised of hayfields with a narrow buffer of trees between the mouth of Hall's Creek and Eagle Point; and 1,494' (0.28 mi.) of forested wetland near the mouth of the Johns River (essentially inaccessible except by boat). This property also includes 1,059' (0.2 mi) of forested frontage on the John's River.

C. Wildlife

Although the Eagle Point Unit is relatively small (457 acres) in size, its interspersed grassland, wetland, and forest habitats can support a diverse assemblage of wildlife. More than 60 species of birds, including 6 that are listed as Vermont species of greatest conservation need, were identified there during breeding bird surveys. Game birds such as waterfowl, turkey, and ruffed grouse, occur on the property as well. Three species of amphibians, including two frogs and a salamander were observed there, in addition to two species of reptiles (both turtles). The most frequently observed large mammal is the white-tailed deer, but black bears, and moose may be found there too; smaller mammals include muskrat, beaver, raccoon, red fox, eastern coyote, mink, and red squirrel (VTFW and USFWS (Draft) 2012).

1. Small Game

Upland small game and furbearer populations that are hunted in Vermont include: ruffed grouse (partridge), rabbit and hare, gray squirrel, crow, red and gray foxes, raccoon, bobcat, muskrat, and coyote. American woodcock, Wilson's snipe, and waterfowl are also considered small game species, but will be discussed in the "Migratory Game Birds" section below. Additionally a small population of ring-necked pheasant has become established on the Unit. Although this species is non-native and not "managed" by the State, they have been noted to attract some hunting activity in recent years. Upland small game and furbearer species are an important component of the diversity of wildlife within Vermont, as well as the Eagle Point Unit.

Ruffed Grouse: The ruffed grouse, or partridge, is the most widely available upland game species in Vermont. Grouse are typically associated with early successional habitat and can be found wherever brushy forest stands provide nesting cover, protection from predators, and food in the form of berries or buds. Overgrown apple orchards, abandoned hillside farms, and regenerating clear cuts covered with hardwood thickets are all grouse hot spots. Although grouse are found Statewide, the Northeast Kingdom, comprising Essex, Caledonia, and Orleans County, where the Eagle Point Unit is located, probably offers the best grouse hunting in Vermont (VTFW 2007a).

The population of ruffed grouse in Vermont is not known, but it is thought to be relatively stable. Attempts to qualify annual ruffed grouse production cannot be done since drumming surveys and grouse brood count surveys are not conducted, and no hunting information is collected. In order to gain information about grouse populations in the State, the VTFW relies on field observations from staff (biologists, wardens, etc.) or anecdotal reports from sportsmen (Hamelin 2012, personal communication).

In 2010, the VTFW sent an informal request to 10 State foresters and biologists regarding their views on how the ruffed grouse population was doing. Their comments suggested that ruffed grouse broods were not particularly large with about 4 to 6 young per hen, given that hens

typically lay between 9 and 13 eggs. In 2011, the VTFW requested information on grouse numbers from the State's woodcock hunters since they opportunistically take grouse while in the woods woodcock hunting. Responses varied, but most hunters thought that grouse numbers were low and were comparable to the past 2 to 3 years (Crenshaw 2012, personal communication).

Rabbits and Hare: Today, two species of lagomorphs, the eastern cottontail and the snowshoe hare, are known to inhabit Vermont. Eastern cottontails were introduced into New England in the late 1800s by wildlife agencies and private hunting clubs, and are most common in the southern regions of the State. They favor agricultural areas with varied habitats, like brushy hedgerows, overgrown fields, and briar thickets, and can be found in areas of the Champlain Valley, though they are less common in Addison, Chittenden, and Grand Isle Counties. The highest concentrations of cottontails in Vermont are found in the lower Connecticut River Valley and the southwestern portion of the State (Rutland and Bennington Counties). Due to forest maturation, clean farming, and a lack of brushy fencerows in agricultural fields, there has been a decline of eastern cottontail rabbits in Vermont since the 1940s. (VTFW 2007b)

Historically, the native New England cottontail occurred in the central and southern portions of Vermont. Competition from the eastern cottontail and the loss of early successional thicket habitat caused their decline. Today, New England cottontails are extremely rare, and, if present at all in Vermont, are confined to the southern part of the State (VTFW 2007b).

Snowshoe hares are native to Vermont and are found throughout the State, though they are most abundant in the Green Mountains and the Northeast Kingdom. The greatest concentrations are found in dense, low-growing softwood areas, such as cedar swamps, spruce bogs, and cut-over areas with thickets of young spruce and fir (VTFW 2007c). They are a favorite of hunters with hounds because they run a hard race instead of holing up like cottontails (VTFW 2010a).

Although the exact population of eastern cottontails and snowshoe hares in Vermont is not known, both populations are thought to be relatively stable. The State of Vermont does not study small game populations, nor does it gather hunting information about these species. Most of the information regarding the State's small game is anecdotal and is gleaned from talking with other knowledgeable wildlife biologists or foresters in the State (Gobeille 2012, personal communication).

Gray Squirrels: Historically, the gray squirrel has always been present in Vermont. Prior to European settlement, the mature forests preferred by the gray squirrel were more abundant. As the forests were cleared for lumber and agriculture, the availability of this type of habitat decreased. As the abandoned farms have reverted back to forests in Vermont, the quality of gray squirrel habitat has slowly improved. Although the gray squirrel can be found throughout much of Vermont, the best habitat and highest populations occur in the oak dominated hardwood forests of the ChamplainValley, Connecticut River Valley, and southern Vermont (VTFW 2007d).

The exact population of gray squirrels in Vermont is unknown, but is thought to be relatively stable. The State of Vermont does not study small game populations, nor does it gather hunting information about these species. Most of the information regarding the State's small game is anecdotal and is gleaned from talking with other knowledgeable wildlife biologists or foresters in the State (Gobeille 2012, personal communication). The VTFW considers gray squirrels a species that is lightly hunted and calls them "the most overlooked small game species" in Vermont (VTFW 2010a).

Crows: Vermont is within the core range of habitat for crows, which are widespread across the State. Crows can adapt to almost any environment, including hardwood forest, riparian areas, wetlands, and coniferous forests, though they reach their highest numbers in a mix of farmland and mature woodlands. In Vermont, these areas include the Champlain Valley, the Connecticut River Valley, and scattered hill farms within the Green Mountains. Crows are less abundant in the Northeast Kingdom (VTFW 2007e).

Considered year-round residents of Vermont, crows undergo some short migrations to neighboring states to the south. They leave the higher elevations of the Green Mountains in winter to reside in the Valleys, areas with a higher human population and a wider variety of food sources.

The exact population of crows in Vermont is unknown, but the species is thought to be stable (VTFW 2007e). The State of Vermont does not study small game populations, nor does it gather hunting information about these species. Most of the information regarding the State's small game is anecdotal and is gleaned from talking with other knowledgeable wildlife biologists or foresters in the State or from anecdotal reports from sportsmen (Gobeille 2012, personal communication).

Furbearer Small Game: Each year the VTFW's Furbearer Program collects a variety of data related to the harvesting of furbearers. Three sources of data—Fur Dealer Reports, the tagging and collection of bobcat, fisher, and other carcasses, and the Trapper Mail Survey—are collected and analyzed annually in order to monitor population trends and make informed management decisions about individual species.

Fur Dealer Reports, required by all licensed Vermont fur dealers, provide an index of yearly fluctuations in pelt sales of pelts purchased from Vermont furbearer trappers and hunters. Information gathered from the tagging and collection of bobcat, fisher, and other carcasses, includes the species, town, watershed/wildlife management unit, date of harvest, and type of take (hunted, trapped, road-killed, etc.). In addition, the collected carcasses are examined to determine the sex, age, and physical condition of each specimen. Trapper Mail Surveys are designed to collect data on a per species basis related to the magnitude and distribution of harvest, the effort expended, the average price received, and the markets into which pelts were

sold including out-of-state dealers. Catch-per-unit (# traps x # nights) effort measured over time can show whether the population of a furbearer species is increasing, decreasing, or remaining stable. Historically, trapping effort has been closely related to harvest size, an indicator that furbearers are not being overharvested in Vermont (VTFW 2012a).

Raccoons: Raccoons are found throughout Vermont, but are more common in mixed woodlands or agricultural fields near water. Although they are vulnerable to disease outbreaks and other population-limiting factors, raccoon numbers have remained fairly steady throughout the Northeast (VTFW 2007f). Since 1996, an aerial rabies vaccine bait drop has been done in six counties of rural Vermont to help slow the spread of the disease. The bait drop program is designed to increase the level of rabies antibodies in the raccoon population. According to the Vermont Veterinary Medical Association (VVMA), the number of raccoon rabies cases in the State peaked with 165 cases in 2007; there were 75 cases in 2008 and only 37 cases in 2009 (VVMA 2012).

The exact number of raccoons in Vermont is unknown, but the population is thought to be healthy and stable. Raccoon densities of 7 to 8 animals per square kilometer were found during surveys by USDA Wildlife Services in 1999 in Coventry, Vermont, which is approximately 12 miles away from Eagle Point. No further density surveys have been conducted by USDA as information from other sites was found to be similar to the Coventry location and adequate for managing the Statewide rabies control program (Dunbar 2012, personal communication).

The State of Vermont does not do surveys to qualify the populations of raccoons or other small game furbearer species. No hunting information is collected on raccoons since all small game falls under the general Vermont State hunting license (Bernier 2012, personal communication). Trapper Mail Surveys, that track trapper catch-per-unit-effort (# traps x # nights), indicate that raccoon trapping effort has been closely related to raccoon harvest. This strong relationship is an indicator that raccoons are not being overharvested in Vermont (VTFW 2012a).

Foxes (Red and Gray): Both red and gray foxes are found in Vermont. Prior to European settlement, the native gray fox roamed the abundant dense hardwoods and mixed forests in the State. Its secretive nature led the settlers to believe that there were no foxes, so they introduced the non-native red fox for hunting. This introduction and the clearing of land for agriculture caused a decline in gray fox population in the early 1800s (VTFW 2007g).

Gray foxes can be found throughout Vermont, but are more common in areas where their preferred habitat is abundant. Dense hardwood or mixed hardwood/softwood forests, along streams or rivers, with nearby overgrown fields for foraging are favored. A hollow log or tree, rock crevice, or brush pile also is needed for a den site. Gray fox can be found in higher densities at lower elevations and in the southern two-thirds of Vermont (VTFW 2007g).

The red fox utilizes a wide variety of habitats in the State, though it prefers a mixture of forest and open areas and uses the transition areas (edge) between them. It also requires a suitable den site, with pathways connecting to resting and feeding grounds that can be used from year to year. In comparison, the red fox is slightly larger than the gray fox and it occupies a wider range of habitats (VTFW 2007h).

The exact number of red and gray foxes in Vermont is unknown, but both populations are thought to be healthy and stable. The State of Vermont does not do surveys to qualify the populations of red or gray foxes or other small game furbearer species. No hunting information is collected on fox since all small game falls under the general Vermont State hunting license (Bernier 2012, personal communication). Trapper Mail Surveys, that track trapper catch-per-unit-effort (# traps x # nights), indicate that both red fox and gray fox trapping effort has been closely related to their harvest. This strong relationship is an indicator that red and gray foxes are not being overharvested in Vermont (VTFW 2012a).

Bobcats: Vermont's bobcat population is stable and well distributed throughout the State. In recent years, higher bobcat densities are found in the Champlain and the Taconic Valleys, instead of the mountains. This is most likely due to a shift in prey; although bobcats are opportunistic and eat a wide variety of species, small mammals and birds make up a large part of their diet. The valleys now support turkey populations, as well as higher densities of small mammals and deer (Pyne 2010).

It is unknown what the status of the bobcat population was in Vermont prior to European settlement, but throughout the 1500s, 1600s, and 1700s, bobcats had to compete with wolves, mountain lions, fishers and marten, in a more severe New England climate. Being at the northern edge of its range in Vermont, the bobcat probably was unable to effectively compete with lynx and mountain lions where deep, fluffy snow conditions existed (VTFW 2007i).

Fewer bobcats may have existed in Vermont before the settlers arrived than are here today. Fluctuations in bobcat populations, and other wildlife populations, occurred as European settlers brought changes to Vermont's landscape. By the late 1800s, unregulated hunting and land clearing for agriculture drove many competitors, like the wolf and mountain lion, to the point of extirpation, and bobcat numbers increased.

The bobcat population peaked from the 1930s through the 1950s, mirroring the high deer population that existed in Vermont at this time. As the deer population declined in the 1970s, and other predators such as the coyote and fisher arrived in Vermont, the bobcat population began to decline to the relatively stable level that exists today (VTFW 2007i).

Bobcats are the only hunted furbearer species in Vermont that have county-specific data collected. Vermont's hunting law dictates that "A person who takes bobcats during the shooting season shall present the pelts and carcasses to a State Game Warden for tagging within 10 days

of the close of the season." It also states that, "Bobcat, fisher, and otter taken in defense of property will be tagged by a State Game Warden, and, at the time of tagging, carcasses will be turned over to the State Game Warden" (VTFW 2010a).

The VTFW also monitors the harvest of bobcats through the annual Trapper Mail Survey that tracks trapper catch-per-unit-effort (# traps x # nights). Historically, bobcat trapping effort has been closely related to bobcat harvest size. This strong relationship is an indicator that bobcats are not being overharvested in the State of Vermont (VTFW 2012a). Bobcats are listed in Appendix II of the Convention on International Trade in Endangered Species (CITES) of Wild Flora and Fauna, so their biological status is closely monitored by the Service as well.

Coyotes: Coyotes were first documented in Vermont in 1948. As European settlers moved westward, clearing the forests and eliminating the wolf, coyotes moved eastward through Ontario and Quebec. They hybridized with eastern wolves and attained a larger size than their western counterparts. Reports of coyote sightings in Vermont increased in the 1960s and early 1970s. Vermont's population since has become well-established and relatively stable. Coyotes are very adaptable and exist in all habitats in Vermont though the highest densities are found in agricultural areas where prey populations are high and varied (VTFW 2007j).

The exact number of coyotes in Vermont is unknown, but populations are thought to be healthy and stable. The State of Vermont does not do surveys to qualify the populations of coyotes or other small game furbearer species. No hunting information is collected on coyotes since all small game falls under the general Vermont State hunting license (Bernier 2012, personal communication). Trapper Mail Surveys, that track trapper catch-per-unit-effort (# traps x # nights), indicate that coyote trapping effort has been closely related to coyote harvest. This strong relationship is an indicator that coyotes are not being overharvested in Vermont (VTFW 2012a).

Muskrats: Muskrats can be found in almost any fresh water in Vermont, but the largest densities are found in the extensive cattail marshes of the Champlain Valley and Connecticut River Valley. In 1853, Zadock Thompson wrote in *Natural History of Vermont* that, "…Muskrats were very numerous in Vermont…four to five thousand skins were exported, to Great Britain annually" to help satisfy the demand for fur. This trend continued in Vermont into the 1980s with as many as 20,000 to 30,000 pelts sold in a year (VTFW 2007k).

Today, the muskrat is a Vermont species of greatest conservation need because its population is in decline nationally for unknown reasons. Muskrat declines began in the mid-Atlantic (West Virginia, Virginia, New Jersey, etc.) in the late 1970s and early 1980s and progressed northward into Ontario and Quebec in the late 1980s. In the late 1990s, muskrat trappers in the Northeastern United States started seeing and harvesting fewer muskrats. No one is sure what is causing this decline, but there are many theories including contaminants, disease, predators, exotic plants, forest succession, etc. (VTFW 2006).

Data taken in Vermont from Trapper Mail Surveys indicate muskrat harvest effort from 1990 to 2008 continued to be closely related to muskrat trapping effort. This strong relationship indicated that the muskrat population was stable and that muskrats were not being overharvested in Vermont (VTFW 2010b).

2. Big Game

White-tailed Deer: In 2011, Vermont's white-tailed deer population was estimated at 123,000 animals. VTFW reported that the 2010 deer population was more vigorous than it has ever been in modern times, resulting in less overall winter mortality (VTFW 2011a). The greatest concentrations of deer in Vermont are found in optimum deer habitat—lower elevation agricultural areas of the State, with a mix of field and forest. Less deer occur in aging forests and high elevation forests, where there is lower quality and diversity of food plants and deep snow. The differences in both the habitat quality, and the density of deer in different areas of the State, are the reason and basis for Vermont being divided into, and managed by, WMUs (VTFW 2009).

Boom and bust cycles have historically characterized Vermont's deer population. Catastrophic conditions in both the deer population and habitat had already developed by the time Vermont's modern-day management program began in 1963. Buck-only deer hunting had been the tradition since 1897, allowed the deer population to grow rapidly and eventually reach the biological carrying capacity. During the 1940s, the deer herd had reached an overabundant and unhealthy state of 250,000 animals (VTFW 2009).

Compromised by years of chronic overpopulation, the deer herd's health and abundance declined in response to harsh winter conditions during 1969 and 1970, and continued to fluctuate throughout the 1970s. Reduced to about 120,000 animals by then, Vermont's deer herd lacked the vigor and supporting habitats that it needed to rebound. In response, the VTFW began a recovery effort by holding the deer population at a low level to allow the habitat to regenerate. When the deer population grew again during the 1990s, some forest habitats were negatively impacted in various parts of the State. Deer densities today in Vermont are believed to be half of what they were during the 1960s, 1970s, and even in the late 1990s (VTFW 2009).

Black Bear: Vermont's black bear population is healthy and estimated at 6,300 animals. The State has one of the densest black bear populations in the country, with approximately one bear for every 3 square miles. The number of bears has slowly increased over the past two decades in response to goals set forth in the past two State bear management plans. Through improvements in habitat, hunting restrictions, and bear management, Vermont's black bears have made a strong comeback. Their numbers are higher today than they have been in 200 years (VTFW 2011e).

In Vermont, the best bear habitat contains a mixture of coniferous trees for protection and escape cover, hardwoods, especially beech and oak, for food, and wetlands that provide a reliable water

supply. Black bears require large tracts of undisturbed forests and are most abundant in the Green Mountains and Northeast Kingdom regions of the State. The dense forestland of Vermont was ideal bear habitat prior to European settlement. By the 1850s, with 75 percent of the land cleared for farmland, the bear population reached an all-time low. The slow reversion of farmland back to woodland over the years has resulted in improved bear habitat (VTFW 2011e).

It was not until 1941 that the black bear was given big game status and received protection under Vermont's laws. Restrictions to black bear harvesting techniques were enacted during the 1960s and 1970s that banned trapping, controlled the use of hunting dogs, outlawed baiting, and prohibited the shooting of bears at dumps. Since 1990, a reduction in the length of the hunting season has helped the bear population grow in size. Bears may be hunted during a 2 ½ month season that opens September 1 and closes the second Sunday of the firearm deer season in November (VTFW 2014).

Wild Turkey: In the fall of 2011, Vermont's wild turkey population was estimated at 45,000 to 50,000 birds. Wild turkeys have thrived in Vermont for the past 30 years, with record numbers occurring during 1996 to 2008. In just 8 years (1995 to 2001), the population increased almost four-fold from approximately 12,000 birds to 45,000 birds (VTFW 2012d). Wild turkeys live in Vermont year-round and have a home range of about 1,000 acres (VTFW 2009).

The wild turkey that inhabits Vermont also occurs throughout the eastern half of the country. Although it requires a varied landscape, it is the most widely distributed, abundant, and hunted turkey subspecies in the United States. Forests are important, especially when they contain oak, beech, and pine stands that produce hard mast crops (acorns, beechnuts, and other seeds) that they consume in the fall and winter months. Forests also provide the large, dominant trees that turkeys use for roosting and the conifers that provide winter protection from deep snow. These types of forests are common in the Champlain Valley, Connecticut River Valley, and the foothills of the Green Mountains and Taconic Mountains of Vermont (VTFW 2009).

Clearings and openings in the forest are also a vital habitat component. Since turkeys are ground nesters, shrubs, and herbaceous plants, like grasses and clover, provide quality habitat for hen turkeys and broods. This habitat offers concealment, as well as abundant insects, which young turkeys rely on for food. The most beneficial clearings are old pastures, dominated by a mix of forbs, weeds, and fruit-bearing shrubs. Trends in agriculture may affect the future distribution and abundance of turkeys in Vermont; as the number of farms and open land continues to decline and the amount of forest habitat increases and ages, wild turkey production may become limited (VTFW 2009).

In order to estimate the population of wild turkeys in Vermont and determine trends, the VTFW collects and assesses turkey harvest data, conducts brood surveys during August and September, and hosts a public web site for citizen brood surveys in August. In addition, turkey sighting surveys are done during the summer and fall. Long-term harvest trends and hunter effort

information indicate that Vermont's turkey population is secure. Given the consistently high number of turkey sightings and the increasing harvest rates, the turkey population is considered stable, at near-peak historic levels (VTFW 2012d).

Historically, wild turkeys were present in southern Vermont, along the Taconic Mountain Range and the Connecticut River Valley. By the mid-1800s, however, wild turkeys had disappeared from Vermont altogether due to deforestation and unregulated market hunting. Private fish and game clubs attempted to re-establish turkey populations during the late 1950s by releasing game farm birds, but this effort failed.

In 1969, the VTFW, in cooperation with the New York Department of Environmental Conservation (NYDEC) , live-trapped and re-located 17 of New York's wild turkeys to the town of Pawlet. A second release of 14 wild birds in Hubbarton, Vermont, took place in 1970. Throughout the 1970s and 1980s, live-trap and transfer techniques were used to move wild turkeys from the original release area in Rutland County to other parts of the State. The effort was a success, and 30 years later, wild turkeys (all descended from the original stock of 31 New York birds) ranged throughout the entire State of Vermont (VTFW 2009).

In the spring of 1973, Vermont's first regulated wild turkey hunting season was held for 12 days in May, in parts of Addison, Bennington, and Rutland Counties. During this season, a total of 23 turkeys were harvested by 579 permitted hunters. The first fall hunt occurred in a limited area of southwestern Vermont in 1975. Hunting opportunities have expanded to other areas of the State as the turkey population has grown. In 2004, for the first time, the entire State of Vermont was opened to spring turkey hunting. In addition, fall turkey hunting opportunities are now afforded in most areas of the State (VTFW 2009).

Moose: Vermont's current moose population is relatively stable at around 3,000 animals, which is within the VTFW's goal of a Statewide fall post-hunt population of between 3,000 and 5,000 animals (VTFW 2009). Moose occur throughout much of Vermont, but are most numerous in the Northeast Kingdom (Orleans, Essex, and Caledonia Counties) and the Green Mountains, where large expanses of thick, brushy, forests occur (VTFW 2012f).

When colonists first arrived in New England, moose outnumbered deer. Unregulated hunting and land clearing changed that; by the late 1800s, moose had disappeared from nearly all of the Northeastern United States, including Vermont. In 1896, the Vermont Legislature closed the moose hunting season. Moose continued to be scarce in Vermont, with only 25 animals known in Essex County during the 1960s. By the late 1970s, however, things began to slowly change. Many decades of moose hunting bans, along with favorable habitat changes (i.e. farms reverting back to forests, improved forestry practices, and a resurging beaver population that created moose-friendly bogs and ponds) all led to increases in Vermont's moose population (VTFW 2010c).

In 1992, the State of Vermont adopted its first moose management plan, and in 1993, the first modern hunt occurred in WMU E (Essex County). In 1995, WMU D2 was opened to moose hunting, and in 1997, WMU D1, where the Eagle Point Unit is located, was opened. Today, moose hunting in Vermont is regulated by a special license that limits the permit holder to a specific WMU. A moose harvest objective is determined each year for each WMU, and a specific number of licenses are issued to achieve target harvests. Licenses are either-sex or limited to cows and calves, as necessary, to achieve area-specific population goals. Continued growth of the moose herd has resulted in expansion of moose hunting into a total of 17 WMUs with 78 percent of the State open to regulated moose hunting (VTFW 2009).

To estimate moose populations in Vermont, the VTFW conducts aerial censuses and examines annual hunter surveys and moose mortality data. Deer hunter and moose hunter surveys provide a measure of relative moose density by WMU, across the entire State of Vermont. Observations and knowledge provided by State game wardens, foresters, biologists, and landowners are also used. Non-hunting mortality and moose hunter success rates provide the basis for the number of moose permits in a given year. Calculated for each WMU that is open to hunting in a given year, hunter success rates are compared to those in previous years to assess changes at the WMU level (VTFW 2009).

3. Migratory Game Birds

Ducks, Coots, and Mergansers: Vermont is an important area for spring and fall migrating ducks in the Atlantic Flyway. More than 30 species of waterfowl have been observed in the State, but only 15 species are known to nest in Vermont. Some species, like the mallard are commonly seen and abundant in almost any wetland environment (VTFW 2007l).

The Eagle Point Unit has the potential to provide breeding, feeding, and/or resting habitat for American black ducks, blue-winged teal, mallards, wood ducks, green-winged teal, common goldeneyes, hooded mergansers, and other species that migrate along Lake Memphremagog and its tributary rivers. Historically, American black ducks were very abundant in the wetlands of the Memphremagog Basin. During 9 years of banding conducted between 1955 and 1970, 1,803 black ducks were banded on nearby South Bay WMA, accounting for 61 percent of all ducks captured on the WMA. Recent observations of black duck broods and hunter harvests indicate that the area continues to provide essential habitat for the species, which is found in numbers much lower than historically observed (USFWS 2010).

Vermont Center for Ecostudies' Breeding Bird Atlas indicated that from the time of the first atlas (1976 to 1981) to the second breeding bird atlas (2003 to 2007), nesting mallard, wood duck, and hooded merganser were shown to increase across all biophysical regions of Vermont, by 121 percent, 73 percent, and 188 percent, respectively. American coots, at the northeastern corner of their range in Vermont, experienced no change with one confirmed breeding record during the first atlas and none during the second (VCE 2012).

Canada Goose, Snow Goose, and Brant: Canada geese are frequently encountered during the spring, summer, and fall, especially in areas with farm fields that provide waste grains and green grasses as food. In Vermont, as in the most of the Atlantic Flyway, there are two different populations of Canada geese: the "Atlantic Population" (AP) Canada geese migrate through Vermont and nest on the Ungava Peninsula of northern Quebec; whereas the "resident" population of Canada geese nest in Vermont and only migrate as far south as they have to during winter. There are no distinguishing features between a resident and migratory Canada goose except for the timing of when they occur in the State. Therefore, in Vermont, the September hunting season specifically targets resident Canada geese, while the October-November season is intended more for the migratory population.

The resident Canada goose population was first introduced to Dead Creek WMA in Addison County, Vermont, in 1956. Their breeding range in Vermont has expanded ever since. Vermont's Breeding Bird Atlas indicated that from the time of the first atlas (1976 to 1981) to the second breeding bird atlas (2003 to 2007), breeding Canada geese were shown to increase across all biophysical regions of Vermont by 1,600 percent, respectively (VCE 2012).

In the early 1900s, only a few thousand snow geese migrated along the Atlantic Flyway from their nesting grounds in the eastern Arctic through northern Quebec and the Eastern United States. Snow geese migrate through Vermont from March through May, and October through December. The Champlain Valley hosts the bulk of the migrating snow geese, though large numbers may be seen at the Dead Creek WMA in Addison County, as well. Snow goose seasons (October to December) are liberal throughout the Atlantic Flyway, due to the devastating negative impacts the ever-increasing population of snow geese has had on its arctic breeding habitat (VTFW 2010a). A spring snow goose season is also permitted in Vermont as a result of flyway concerns for the burgeoning snow goose population; however, results of liberal hunting regulations have failed to increase the harvest as intended to protect nesting habitats (USFWS 2012a)

The abundance and presence of migratory brant in Vermont is erratic and can vary widely from year to year. Brant are most often seen in October or November flying southbound over Lake Champlain, but they can occur in the Connecticut River Valley as well (Murin and Pfeiffer 2002).

American Woodcock: The American woodcock, a Service focal species of management concern and a Vermont species of greatest conservation need, is a popular game species in Vermont and throughout its range. In the Northeastern United States, as well as Vermont, the woodcock population has steadily declined from its peak, more than a century ago, when abandoned farmland provided large amounts of quality, early successional habitat that the species needs for survival (VTFW 2007m).

The American woodcock's range encompasses the eastern half of the United States, roughly from the Mississippi River eastward. Woodcock are migratory birds, breeding mostly in the northern two tiers of states and southern Canada and wintering in the south. The species is managed on the basis of two regions or populations—the Eastern and Central—based on band recovery data which indicated that there was little crossover of birds between the regions. The boundary between these two regions also conforms to the boundary between the Atlantic and Mississippi Flyways. Vermont is in the Eastern management region.

The Service, with cooperation from State wildlife agencies, conducts annual counts of displaying male woodcock during the peak of the breeding season. Data from these "singing-ground surveys" are used to monitor population trends in each management region. Vermont is one of 13 states in the eastern management region participating in the annual surveys; the other states are Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Virginia, and West Virginia.

The singing ground surveys have been conducted on designated routes in Vermont annually since 1968. From 1968 to 2011, the number of woodcock heard on Vermont routes has declined by an average of 0.42 percent per year, which is less than the 0.88 percent per year average decline in the Eastern management region during the same period. Results from the singing ground surveys show a continental decline per year of 0.82 percent during this same 43-year period (Cooper and Rau 2012). The State of Vermont does not do any formal production surveys other than the spring singing ground survey for woodcock.

Wilson's Snipe: Although considered uncommon in the State in the past, the Wilson's snipe is currently a widespread breeder in Vermont, particularly in the Northern Vermont Piedmont Region and the Champlain Valley. It is found in a variety of wet open habitats including bogs, fens, sedge meadows, wet fields, and alder and willow swamps, and can be expected to breed wherever suitable open wetlands can be found.

Wilson's snipe was one of the most intensively hunted birds by 19th century market hunters. The species survival has been attributed to its secretive nature and the fact that it does not travel in large flocks. Hunting of the species was banned in the United States from 1941 to 1953. Although the continental population of Wilson's snipe may never reach historic levels, the Northeastern United States population remained at a stable level from 1966 to 2005 (Sauer et al, 2005).

4. Endangered, Threatened, and other Non-game Species

The State of Vermont has five federally threatened or endangered species that receive legal protected under the Endangered Species Act of 1973 (ESA; 7 U.S.C. § 136, 16 U.S.C. § 1531 et seq.), as administered by the Service and the National Oceanic and Atmospheric Administration (NOAA). However, no federally threatened or endangered species are known from Orleans

County where Eagle Point is located. A letter of no effect from the Service's New England Field Office was obtained in 2013.

There are, however, two State-endangered species legally protected under the Vermont endangered species statute {10 V.S.A. Chap. 123 section 5401}, as administered by the Agency of Natural Resources (ANR). The bald eagle is a Vermont State-endangered species. Due to a 3-year "eagle hacking" program and immigration of adult eagles from surrounding states and Quebec, the bald eagle has gradually established territories in Vermont. During 2008, in the upper Connecticut River Valley of Vermont, young fledged from the first successful bald eagle nest in over 60 years; in 2009 a second upper Connecticut pair was successful.

Bald eagle sightings on South Bay WMA, near the Eagle Point Unit, are increasing as birds from both the Connecticut River Valley and the Champlain Valley move inland, though little natural shoreline still occurs there. At the Eagle Point Unit, over a mile of undeveloped shoreline and mature pine trees have the potential to play a role in bald eagle recovery in the north central part of Vermont (VTFW and USFWS (Draft) 2012). Most bald eagle use of the Eagle Point Unit would occur during the spring, summer, and early fall. It is unlikely that the level of hunter use on the refuge during those seasons would create significant impacts or change the behavior of bald eagles using the area. The amount of land owned by the Service is small enough to only be a small part of an Eagle's required habitat; Lake Memphremagog will likely constitute the main foraging area for eagles.

Six species of uncommon plants, as well as four species of rare or very rare plants, one of which is listed as a State-endangered species, have been located within the Eagle Point Unit. A list of these species can be found in the LRMP (VTFW and USFWS (Draft) 2012). The State-endangered plant species, however, is not identified in this report or the Eagle Point LRMP due to data sensitivity concerns. Land managers are aware of this species and the threats to it including changes in water quality, vegetative succession, and competition from emergent vegetation. No potential threats to the species would occur by allowing hunting on the Eagle Point Unit. Spring and summer hunting seasons would have no impact on this species due to the fact that its habitat does not overlap in areas where game would be pursed at this time. By the time fall hunting seasons occur on the unit, the plants would have already died back and become dormant (Hamelin 2012, personal communication).

In summary, continuing to hunt the Eagle Point Unit according to State seasons and regulations would not adversely impact populations of threatened or endangered species that occur there. Other uncommon or rare non-game species listed in the draft VTFW Eagle Point Long Range Management Plan (LRMP) include: common loon, great blue heron, American bittern, osprey, red-tailed hawk, northern harrier, great-horned owl, mink frog, and river otter. Hunting various game species on the Eagle Point Unit is unlikely to affect any uncommon or rare species as well.

D. Cultural Resources

The National Historic Preservation Act (NHPA) requires that any actions by a Federal agency, that may impact archaeological or historical resources, be reviewed by the State Historic Preservation Office (SHPO), and that identified impacts be avoided or mitigated. Service policy is to preserve these resources in the public trust, avoiding impacts wherever possible.

Consultation with the Vermont Division of Historic Preservation (DHP) indicates that there are no recorded archaeological sites on the Eagle Point Property. DHP staff and several local archaeology consultants note that although the area is widely considered to be highly sensitive archaeologically, very little systematic survey work has been done in the area. Therefore, given the lake/wetlands/streams/promontory-bluffs association on the Eagle Point property, it is likely that prehistoric or historic archaeological sites may be located within the area.

E. Land Use and Economy

Eagle Point is in the town of Derby, located in the northern part of Orleans County, Vermont, with the entire northern boundary of the town being the international border with Canada. The local economy is based primarily on agriculture, forestry, and local services. The town includes the villages of Derby Center and Derby Line each of which includes commercial districts. Significant bodies of water within the town include Lake Memphremagog, Derby Pond, and Salem Lake as well as the Clyde River and Johns River. The town has a total area of 36,877 acres with the northern boundary being Canada, the eastern boundary being Holland, Morgan, and Charleston, the southern boundary being Coventry and Brownington, and the western boundary being Newport. The population of the town of Derby is 4,604 and there are 2,258 housing units. According to the Vermont Indicators On-line, a collaborative data centralization and clearinghouse of information managed by the University of Vermont, Center for Rural Studies and Vermont Center for Geographic Information, the per capita income of Derby is $17,192, the median home value is $166,789, and the average annual wage is $32,970. According to real estate appraiser Daniel Berna, single family dwelling prices range from $50,000 to $1,000,000. The Eagle Point Property's immediate neighborhood is rural residential and lakefront in nature and consists of a mix of open space and residential use with a trend of gradual conversion from open space to residential use.

Lake Memphremagog and this region of Vermont are noted for hunting and fishing experiences. The existing character of the Eagle Point Property is well suited for nature and wildlife-based activities. In 2006, a National Survey by the Service found that hunting, fishing, trapping, and wildlife viewing generated over $376 million annually in direct expenditures in Vermont. Hunting and fishing contributed more than $253 million of this amount. These dollars are spent throughout the State, but often are spent in rural communities where these activities occur more often. A 2000 National Survey of the Vermont Visitor by University of Vermont's School of

Business Administration and the Vermont Tourism Data Center found that tourists coming to Vermont for the primary purpose of fishing or hunting spent an average of $2,096 in Vermont on their trips during the year. This was higher than average expenditures for all the other types of recreation in the survey.

V. Environmental Consequences of the Proposed Action and Its Alternatives

The scope of analysis for the environmental consequences is limited to those resources that could be impacted by the proposed action and its alternatives–specifically, the natural environment, both vegetation and wildlife populations, and the local economy. No construction or earth-moving activities would occur. Therefore, implementation of a hunting program on the Eagle Point Unit of the Missisquoi NWR would have no impact on water quality, cultural or visual resources, or land use.

Public hunting is an existing use of the Eagle Point Unit; it was permitted and occurred when the property was privately owned by Michael Dunn. Although some small game, big game, and migratory bird hunting will occur on the property, the fact that it is a relatively small acreage, near residential dwellings, and adjacent to the Canadian border, most likely will limit the use. A negligible to no increase in traffic is anticipated, and no negative impacts to air quality, from vehicular emissions, is expected. The impacts of transferring land from private to public ownership to create the Eagle Point Unit of the Missisquoi NWR was thoroughly analyzed in the Final Environmental Assessment issued by the Service in 2010, and, therefore, is not at issue here.

1. Direct/Indirect Impact Analysis

A. Alternative 1 (Proposed Action): Continue to hunt the Eagle Point Unit of the Missisquoi NWR, following State of Vermont seasons and regulations.

1. Vegetation

The physical effects of hunting various game species on the vegetation of the refuge are expected to be minimal. Vehicles usually cause the greatest negative impact on vegetation, however, this would not be the case on the Eagle Point Unit, since all-terrain vehicles are not allowed and other vehicles are restricted to designated roadways. The physical impact of hunters and their dogs on the vegetation is also expected to be small, since they would be dispersed throughout the unit, instead of being concentrated in specific areas.

Little if any significant negative impacts of this alternative to the vegetation of the unit are expected. In fact, indirect positive effects on the vegetation may result from hunting white-tailed deer, due to better regeneration of forest canopy species and an increase in the diversity of the herbaceous understory.

2. Wildlife

a. Small Game

Upland small game and furbearer populations that are hunted include: ruffed grouse (partridge), rabbit and hare, gray squirrel, crow, red and gray foxes, raccoon, bobcat, muskrat, and coyote. Additionally a small population of ring-necked pheasant has become established on the Unit. Although this species is non-native and not "managed" by the State, they have been noted to attract some hunting activity in recent years. Although the VTFW considers American woodcock, Wilson's snipe, and waterfowl, small game species, these will be discussed in the "Migratory Game Birds" section below.

Upland small game and furbearer species are an important component of the diversity of wildlife within Vermont, as well as the Eagle Point Unit. Anticipated direct, indirect, and cumulative impacts to the upland game populations of the refuge are further described below.

Ruffed Grouse: Ruffed grouse are found throughout much of the Eastern United States, yet are common only where extensive tracts of forest dominate the landscape. Although ruffed grouse can be found in many different types of forest, they are typically associated with early successional habitat, and prefer aspen and white birch in three age classes (0-10, 10-25, and 25+ years) all located within a 40-acre area. In New England, ruffed grouse are year-round residents, occurring more commonly inland and at elevations below 3,000 feet (VTFW 2007a). Vermont is within the core range of ruffed grouse habitat. Native to Vermont, the ruffed grouse is considered the most abundant upland game bird in the State.

Vermont's Breeding Bird Atlas indicated that ruffed grouse occurred in 93 percent of the Northern Vermont Piedmont region, where the Eagle Point Unit is located. From the time of the first atlas (1976 to 1981) to the second breeding bird atlas (2003 to 2007), ruffed grouse populations were shown to decline 1 percent in the Champlain Valley and the Southern Vermont Piedmont, but experienced no change in the Northern Vermont Piedmont region (VCE 2012).

Ruffed grouse abundance often fluctuates from year to year, throughout their range, as well as throughout a particular region. Across their northern range, ruffed grouse numbers have risen and fallen in a somewhat predictable pattern for most of this century, in what is often called an "8- to 10-year cycle." During the cycle, local populations increase for 4 to 5 years, peak, and then steadily decline for 4 to 5 years. The factors responsible for these periodic fluctuations remain poorly understood, but appear to involve a number of different factors interacting with one another in different ways at different times (VTFW 2007a). Both the number of ruffed grouse hunters and the number of ruffed grouse harvested increase during years when populations are at or near the peak of their cycle (Dessecker et al. 2007).

Causes for short-term fluctuations in ruffed grouse abundance may be related to weather trends, and variations in the quantity and quality of food resource, which are largely interrelated. Superimposed upon those factors is predation—if grouse spend the winter feeding on poor quality food, or use excessive amounts of energy to keep warm, they are more susceptible to predators. This combination of factors also affects annual production, since hens may not have sufficient reserves to produce a clutch of viable eggs, or vigorous, healthy chicks in the spring (Ruffed Grouse Society 2013). Long-term decreases in ruffed grouse populations, however, are more related to the decline, fragmentation, and isolation of early successional forest habitats. Hunting is considered a compensatory mortality factor with habitat availability, predation, and weather having the most effect on grouse population dynamics (Dessecker and McAuley 2001).

According to the Vermont Breeding Bird Atlas, ruffed grouse populations seem be fairly stable throughout the State. Although some suitable habitat for ruffed grouse is found in the forested areas of the Eagle Point Unit, due to the small size of the tract, and the even smaller amount of preferred grouse habitat, hunting there is expected to have no impact on the local or regional grouse population.

Rabbits and Hares: Cottontails do not distribute themselves evenly across the landscape, but tend to concentrate in favorable habitat, around farmland, where fields and pastures are interspersed with hedgerows and low dense brush. A combination of habitats in close proximity to one another is important, since the average home range for eastern cottontails is 10 acres, though they rarely travel more than a half-mile per day (NRCS 1999).

In Vermont, snow cover limits the distribution and densities of the eastern cottontail rabbit population. Dense vegetation can provide adequate summer cover, but in order for the rabbit to survive the Vermont winters, dense woody vegetation is critical. Because of this species' need for cover throughout their life cycle, cover availability is the most important limiting factor for cottontails (VTFW 2007b).

Cottontail populations fluctuate widely from place to place and from year to year. Factors such as weather, disease, and predators can influence rabbit abundance; though healthy populations can usually be maintained as long as there is suitable habitat. Densities of one to three cottontails per 2 acres can be expected under optimum conditions (VTFW 2007b). Distribution and interspersion of food and cover within an area determines whether or not the area can support a rabbit population, though cottontails will select areas of better cover over areas with abundant food if both are not found together (NRCS 1999).

Cover is also the single most important habitat need for the snowshoe hare. Two types of cover are necessary: dense coniferous cover (average tree height of 11 feet) for daily activities, and softwood cover (tree height ranges from 15 to 45 feet and best described as small pole timber, 6

to10 inches in diameter) to act as travel corridors. All of the habitat needs of a snowshoe hare should be met within a 20-acre home range.

Snowshoe hare populations fluctuate in a cyclic fashion with peaks occurring every 8 to 11 years. An Alberta study has found population densities ranging from 0.1/acre in low years to 4/acre in high years during a 16-year period (VTFW 2007c).

The Eagle Point Unit contains little to no habitat for cottontail rabbits or snowshoe hares, and neither have been observed there (Hamelin 2012, personal communication). Although rabbit and snowshoe hare hunting is a popular sport in the Northeast Kingdom, we anticipate little to no hunting on the Eagle Point Unit. The small size of the tract and lack of quality habitat limit hare populations and the close proximity to the Canadian border make it unlikely that rabbit hunters would use their dogs to hunt there. Nearby WMAs offer larger hunting areas with less risk of having hunters and their dogs trespass into Canada unintentionally. No impact on the local or regional eastern cottontail or snowshoe hare populations, from hunting on the Eagle Point Unit is expected.

Squirrels: In Vermont, the best gray squirrel habitat consists of mature hardwood forest with a high component of oak, hickory, and beech. A closed canopy is usually preferred so that the squirrel can travel above ground and avoid predation. The availability of alternate food producing trees such as ash, maple, butternut, hophornbeam, and black cherry can buffer against years of poor mast crops. Good habitat should have two or more primary hard mast tree species plus several alternate food producing trees. A permanent source of water, such as a pond or a stream, is also important (VTFW 2007d).

A minimum of 150 pounds of acorns and nuts per acre is required to maintain good gray squirrel populations. To provide this amount, hard mast producing trees must be 15 inches in diameter at chest height and be a major component of the forest. When no food can be found, mortality will be high and populations can drop up to 25 percent. Populations usually recover to former levels after a couple of good mast years.

The home range of a gray squirrel varies from 1 to 25 acres depending upon habitat quality; normal daily movements average only 160 feet. A gray squirrel density of 1/acre is a reasonable goal in good habitat, with 2 to 5/acre possible in the very best habitats (VTFW 2007d).

Gray squirrels have not been observed at the Eagle Point Unit, which lacks a substantial stand of mast producing trees, however, they are found in the nearby town of Derby, Vermont, in Orleans County (Hamelin 2012, personal communication). Since food supplies are inadequate to sustain a population of gray squirrels, the occurrence of squirrels on the Unit will be uncommon. Any take of squirrels is expected to be incidental to hunting other upland game species and would have little to no impact on the local or regional populations of gray squirrels.

Crows: Vermont's Breeding Bird Atlas indicated that crows occurred in 100 percent of the Northern Vermont Piedmont region, where the Eagle Point Unit is located. From the time of the first atlas (1976 to 1981), to the second breeding bird atlas (2003 to 2007), crow populations remained stable throughout most of the State, except for increases by 3 percent in the Northern Vermont Piedmont region, 4 percent in the Southern Green Mountain region, and 6 percent in the Northern Green Mountain region. West Nile Virus has the potential to reduce local crow populations, but the highest mortality is expected to result from hunting (VCE 2012).

Since 1980, the VTFW has been required by Federal law to establish formal crow seasons under frameworks established by the Service. These guidelines state that a crow season cannot exceed 124 days in length and must occur outside the peak nesting period (50CFR 20.133). At that time, the VTFW Board established a split crow season that ran from March 14 to April 30 and from August 14 to October 29. This season has been in place ever since, though the VTFW has received a number of requests to change the season dates to allow days during the fall and winter months (Crenshaw 2012, personal communication).

In April 2012, the VTFW, interested in seeking the opinions of crow hunters regarding potential changes to the dates of the crow season, gave a crow hunting survey to 32 Vermont crow hunters. Of these, 27 surveys were filled out and returned. Responses varied (range of 1 to 45 days), but the average number of days that these hunters spent crow hunting was 15. Spring hunting (89 percent of hunters that responded) was most popular, followed by summer (44 percent), and then fall (29 percent), when some hunters reported that they hunted crow while out scouting for deer or hunting grouse (Crenshaw 2012, personal communication).

Due to the small size of the Eagle Point Unit, crow hunting there is expected to be mainly opportunistic, when hunters are on the property scouting for or hunting other species. The State crow season as permitted by the Service (50 CFR 20.133) has been in place for over 30 years and is restricted to prevent harvest during peak nesting season to prevent statewide impacts to the population. No impact on the local or regional crow population is expected from hunting on the Eagle Point Unit.

Furbearer Small Game

Raccoons: No raccoon population data is available for individual counties, or the State of Vermont as a whole, though estimates that 15 to 20 times as many raccoons occur in North America today than during the 1930s seem to be true for Vermont as well (VTFW 2007n). Historically, raccoon trapping effort has been closely related to harvest levels in Vermont. More recent data (1990-2008) from Trapper Mail Surveys indicates that this is still true (VTFW 2010b).

Raccoons and bobcats are the most pursued furbearers by hunters in the State of Vermont, especially by those that hunt with dogs (Bernier 2012, personal communication). Although the

Eagle Point Unit contains habitat for raccoons, the small size of the tract and its close proximity to the Canadian border, make it unlikely that raccoon hunters would use their dogs to hunt there. No impact on the local or regional raccoon population from hunting on the Eagle Point Unit is expected.

Foxes (Red and Gray: There are no population data for red fox in Vermont, though it is thought to be fairly common throughout its range and abundant in its preferred habitat. Red fox can experience dramatic declines in number when hit by diseases, such as rabies, but it can recover quickly (VTFW 2007h). Currently, the red fox population in Vermont is experiencing one of these decreases (Bernier 2012, personal communication).

Trapper Mail Surveys from 1990-2008 indicate that the red fox population in Vermont is stable, since trapping effort mostly relates to harvest levels. Catch-per-unit-effort, however, decreased in 1993, and from 1995 to 1997, in response to a disease outbreak (VTFW 2010b).

No data are collected for gray fox in the State of Vermont, though the species is thought to be fairly common throughout its range and abundant in its preferred habitat (VTFW 2007g). Based on Trapper Mail Surveys from 1994 to 2000, fewer gray fox (8 to 38 per year) were trapped than red fox (87 to 190 per year) each year. Gray fox trapping effort mostly relates to harvest levels, though canine diseases and parasitic infections, such as heartworm and distemper, can occur in a population that has grown too large. More recent Trapper Mail Surveys indicate that Vermont's gray fox catch-per-unit-effort remains stable. Vermont's changing landscape has benefited the gray fox; as farms were abandoned in the 1850s, and fields slowly reverted back to forests, habitat for the gray fox has improved (Bernier 2012, personal communication).

Due to the small size of the Eagle Point Unit, fox hunting there is expected to be mainly opportunistic, when hunters are on the property scouting for or hunting other species, like deer. Only negligible effects on the local or regional red fox or gray fox population are expected from hunting on the Eagle Point Unit.

Bobcats: The bobcat was the last mammal in Vermont to have a bounty on its head. In 1856, bobcats were added to the bounty law by the legislature and remained there until 1971. Between 1955 and 1970, approximately 265 bobcats were taken per year, as a result of the bounty. The first regulated season on bobcats began in 1976 (VTFW 2007i).

Today, an estimated 2,500 to 3,500 bobcats live in Vermont, where they are considered a species of greatest conservation need (Pyne 2010). Bobcats are mobile predators requiring large home ranges. A study in Vermont found that bobcat home ranges varied from 70.9 km^2 for males to 22.9 km^2 for females (Donovan et al. 2011). Although they have adapted to a wide variety of habitats throughout the State, bobcats rely on forested areas with rocky cliffs and ledges, and scattered swamps, and seem to be most successful in large tracts of undeveloped land connected by vegetated linkages. The focus of current bobcat management in Vermont is to collect harvest

and biological data to better monitor and protect the species, and to identify and conserve important bobcat habitats (VTFW 2007i).

Bobcats and raccoons are the most pursued furbearers by hunters in the State of Vermont, especially by those that hunt with dogs (Bernier 2012, personal communication). The annual bobcat take, including incidental losses, has climbed from about 20 in the 1990s to more than 70 in recent years, which is believed to reflect the increase in its population (Pyne 2010). Of the 52 bobcat taken during 2004-2005 and the 65 bobcat taken from the 2005-2006 season, two each year (or only 3 percent of the State's total) were taken from WMU D1, where the Eagle Point Unit is located. Sixty-one bobcats were reported and tagged by Vermont's wardens during 2007-2008 season. Trapper Mail Survey data show that bobcat trapping effort closely relates to bobcat harvest levels during 1991 through 2007, meaning that bobcats are not being overharvested in the State (VTFW 2008).

The 2010-2011 season bobcat harvest was well distributed throughout the State with the heaviest harvests recorded in the northeast, south-central, west, and southwest portions of the State. Although the distribution of the harvest is heavily influenced by where hunting and trapping effort is applied, these harvest records minimally show that bobcats exist in each of the State's 24 WMU's and that the effort for and harvest of bobcats have remained relatively consistent for the past 10 years. Of the 68 bobcats harvested during the 2010-2011 season, 35 (51 percent) were trapped, 24 (35 percent) were hunted, and the remaining 9 (13 percent) were taken either incidentally, in defense of property, illegally, or were road-killed. This breakdown is remarkably close to the 10-year averages for these statistics and reflects the stable nature of both the bobcat hunting and trapping seasons as well as the stability of the bobcat populations throughout the State. A review of the age and sex structure of the bobcat harvest reveals no alarming trends and reflects the relatively stable nature of the present bobcat population (VTFW 2012a).

Bobcats are the only hunted furbearer species in Vermont that have county-specific data collected for them. Because bobcats are listed in Appendix II of the Convention on International Trade in Endangered Species (CITES) of Wild Flora and Fauna, their biological status is closely monitored by the Service as well. Although the diversity of wetlands, meadows, forests, and rocky ledges on and near the Eagle Point Unit provides bobcat habitat, the small size of the Unit (1.8 km^2) would only account for 2.5 to 7.8 percent of a single bobcat's home range. In addition, the small size of the tract and its close proximity to the Canadian border, make it unlikely that bobcat hunters would use their dogs to hunt there. Habitat loss and fragmentation and road mortality are the likeliest causes of bobcat declines in Vermont (Kart et al. 2005). Therefore, no impact on the local or regional bobcat population is expected from hunting them on the Eagle Point Unit.

Coyotes: The population of eastern coyotes in Vermont is thought to be healthy and stable, and estimated at between 4,500 and 8,000 animals, with fewer animals in the population during the winter. Historic as well as more recent data (1990 to 2008) from Trapper Mail Surveys indicates

that coyote trapping effort is closely related to harvest levels in Vermont (VTFW 2010b). It is thought that the coyotes will continue to thrive in Vermont as long as habitat conditions allow (VTFW 2007j).

Coyotes are very adaptable and exist in all habitats in Vermont, including suburban areas. Part of the reason for the amazing success of coyotes is their incredible adaptability to human changes in the landscape. Although coyotes are habitat generalists, a study completed in Vermont in 1988 found that coyotes in the Champlain Valley tend to use forested habitats more during winter and spring and open areas more during summer and fall. Use of different habitats by coyotes depends on many factors, including the abundance of prey, weather, topography, and competition with other predators (VTFW 2007j).

Coyote family groups in Vermont have an average home range size of 15 square miles. Habitat within the home range may include forested areas of hardwood and softwood trees, pastures and fields, wetlands and developed areas. Family groups focus most of their activity within a smaller core area of 4 to 8 square miles that they actively defend from other coyotes; this territoriality limits the total number of coyotes that Vermont can support. Eagle Point is only 0.71 square miles in size and there would represent only 4.7 percent of the total area required for a family group's home range.

Coyote reproduction and survival is tied directly to habitat and food availability. Coyotes are density-dependent breeders; as the number of coyotes in an area decreases, their reproductive rates increase. Coyote control efforts, therefore, are often unsuccessful because they tend to stimulate reproduction (VTFW 2007j).

The eastern coyote is an opportunistic omnivore; it will eat anything, including small rodents, plants, hare and rabbits, insects, and livestock carrion, depending on what is easily obtainable. Deer are also a part of the coyote diet. Research has shown that although coyotes prey on fawns in the spring and feed on vulnerable deer that may not survive the harsh winter weather, they are not a major controlling factor on deer numbers (VTFW 2007j). Even though the State deer herd has increased over the years, coyotes are the most persecuted animal in Vermont, in part, because they kill deer. Deer hunters often opportunistically take coyotes while hunting deer or they hunt them by using predator calls or dogs at other times of the year (Bernier 2012, personal communication).

Due to the small size of the Eagle Point Unit, coyote hunting there is expected to be mainly opportunistic, when hunters are on the property scouting for, or hunting other species, like deer. The size of the tract and its close proximity to the Canadian border, make it unlikely that coyote hunters would use dogs to hunt there. No negative impact on the local or regional coyote population is expected from hunting on the Eagle Point Unit.

Muskrat: In Vermont, reports of muskrat populations are mixed. Anecdotally, some wetlands are described as completely devoid of muskrats, while others are said to have healthy, abundant populations. This information indicates that muskrat declines in Vermont may be specific to certain areas, instead of being Statewide in nature.

Trappers and biologists from around the Northeastern United States continue to be concerned about muskrat populations. In 2010, Nathan M. Roberts, Cornell University Department of Natural Resources and NYDEC, reviewed muskrat harvest and effort data from nine states (Connecticut, Massachusetts, Maine, New Jersey, New Hampshire, Pennsylvania, Rhode Island, Virginia, and West Virginia) and three provinces (New Brunswick, Ontario, and Quebec). In most places, the muskrat harvest has declined, though the decline does not appear to be a function of pelt price, like it is with other furbearers (Roberts and Crimmins 2010).

A review of muskrat sex/age data collected during the past 4 years (2008 to 2012) does not reveal any alarming trends in Vermont's muskrat population. The sex and age structure of harvested muskrats appears to be relatively stable with more males harvested than females, and more juveniles harvested than adults. In addition, Trapper Mail Survey data has not significantly changed in 20 years. When the sex/age data is looked at in conjunction with the Trapper Mail Survey data, the catch-per-unit-effort (# traps x # nights) supports the stable nature of the sex and age structure of the harvest. Therefore, the data indicate overall that the muskrat population in Vermont is not in immediate danger and can support regulated harvest (VTFW 2012a).

The Eagle Point Unit is a small property with limited wetland habitats. Hunting muskrat there likely will have no direct significant impact on regional or State population levels.

In conclusion, the harvest of small game species will likely have no direct significant impact to local or regional populations of these species.

b. Big Game

White-tailed Deer: In 2011, Vermont's pre-hunt deer population was estimated at 123,000 individuals—a number that is comfortably within the limits of the deer population goal set in Vermont's 2010-2020 Big Game Management Plan. The population density of a deer herd affects the general health of the animals, the sustainability of its habitat, and determines the probability of human and animal conflicts. Vermont statutory law states that "an abundant, healthy deer herd is a primary goal of fish and wildlife management (Title 10 V.S.A. §4081). To achieve this deer management goal, the VTFW sets different density objectives (deer per square mile) for different regions of the State, and allows regulated hunting seasons.

Deer densities today in Vermont are believed to be half of what they were during the 1960s, 1970s, and even in the late 1990s. When deer numbers increased during the 1990s, deer

populations grew to levels that again began to impact forest regeneration. In southeastern Vermont, high deer densities have impacted the habitat in various ways: deer have consumed much of the native oak, maple, and ash, while invasive species, such as buckthorn and barberry, which are not palatable to deer, have replaced them. Similar effects, although not as dramatic, occurred in other parts of the State as well (VTFW 2009).

In most habitats throughout the State, 15 to 20 deer per square mile seems to be the appropriate amount to maintain Vermont's herd health, and to balance the population with what is now a lower carrying capacity. For the Northeast Region of Vermont, where the Eagle Point Unit is located, the deer population goal is lower, at 10 to 15 deer per square mile (VTFW 2009).

Although deer densities vary in response to habitat and weather conditions, it appears that 17,000 deer harvested per year is a sustainable level for Vermont. In 2011, hunters harvested 12,132 deer in Vermont, with 982 being harvested from Orleans County. In the town of Derby, where the Eagle Point Unit is located, 157 deer were harvested—53 by archery, 49 by youth, 51 by rifle, and 4 by muzzleloader. The deer harvested in Derby represented 1.3 percent of the total deer harvested in the State of Vermont (VTFW 2012b). In 2010, Vermont deer hunters harvested 15,523 deer throughout the State, a 2 percent increase from the 2009 harvest. Of the 1,438 deer taken in Orleans County in 2010, 168 were taken from the town of Derby, which represented 1.1 percent of the total Vermont deer harvest (VTFW 2011a).

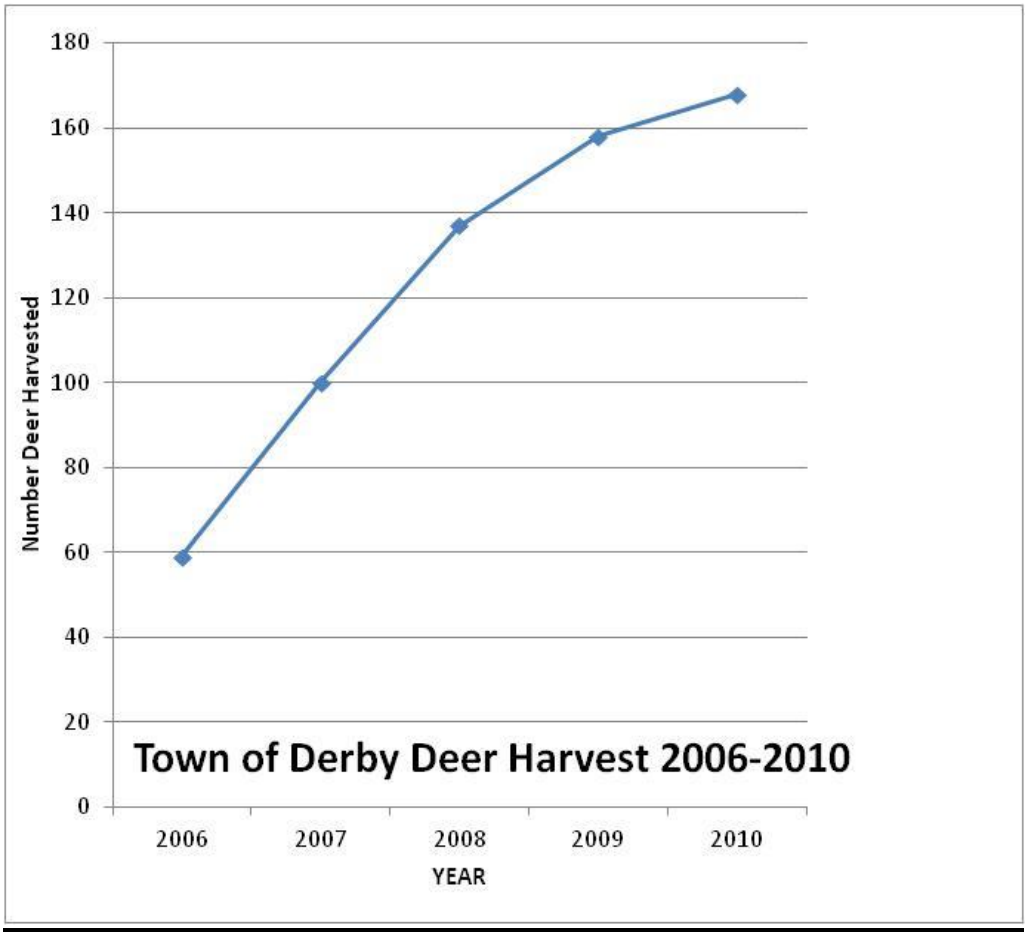
The deer population in the town of Derby has increased dramatically over the past 5 years, as the number of deer harvested in the town has nearly tripled during the period 2006–2010 (Figure 2). An overabundance of deer results in over-browsed food resources, damaged habitats, and unhealthy deer. High densities of deer can damage wintering habitats, making the population more susceptible to disease and death, especially when severe winters follow in subsequent years. Deer are also more susceptible to winter-kill when there are too many sharing summer-autumn food resources, and they cannot store ample fat for the upcoming winter. Maintaining a healthy deer herd is the best way to minimize the boom and bust population cycles that have occurred historically in Vermont (Berry 2011).

This alternative (Proposed Action) would allow the continuation of hunting on the Eagle Point Unit following State of Vermont seasons and regulations; it *would not* restrict deer hunting with a rifle, to portable tree stands only. The refuge consulted with the VTFW and other law enforcement officials on the safety considerations of this action. According to the VTFW, public safety is adequately protected from existing State safety codes which should apply equally to protect the public from hunting on the refuge. Safety policy for the State of Vermont has been proven effective in all the State's WMAs (Vermont statute Title 10 VSA 4710). Rifle hunting was permitted on these tracts prior to refuge acquisition managed only under State guidelines with no known reported incidents.

Allowing hunters the opportunity to harvest deer on the Eagle Point Unit during all open seasons

(archery, firearm, muzzleloader) is consistent with the VTFW goals of stabilizing the deer population and achieving the objectives of deer under the Vermont Big Game Management Plan. Regulated deer hunting in the Eagle Point Unit will contribute significantly to minimizing the landowner conflicts associated with a locally overabundant deer population (browsed landscape plants, garden damage, and vehicle collisions) as well as maintain the health of the animals and surrounding habitat (Hamelin 2012, personal communication).

Figure 2: Total Deer Harvest in town of Derby 2006–2010



Source: Vermont Fish and Wildlife Department

Black Bear: Vermont's black bear population is estimated to be around 6,300 bears, slightly higher than the objective of 4,500 to 6,000 bears listed in Vermont's 2010-2020 Big Game Management Plan. The population has increased during the past 20 years and is believed to be higher now than it was before European settlement (VTFW 2011e). Vermont's bears are in good health due to regular monitoring and modifications in hunting regulations. Population and habitat indexes, sex and age data collected during the mandatory bear harvest registration, and

public input guide the management of black bears in the State (VTFW 2011b).

The annual bear harvest in Vermont has increased incrementally since the 1970s, from an average of 230 animals from 1970 through 1980 to 505 animals from 2000 through 2010. This indicates a healthy and growing bear population in the State. In Vermont, all licensed hunters are potential bear hunters, since a bear tag is provided with every big game hunting license sold. Therefore, the total number of bear hunters in the State is unknown as is the number of deer hunters that would take a bear if given the opportunity (VTFW 2011b).

Bear harvest fluctuates widely between some years, usually due to food availability and weather conditions. During the 2011 season, licensed hunters took 396 black bears in Vermont. This harvest was 26 percent below the 2010 harvest of 537 bears, and 22 percent below the 10-year average of 505 bears. The counties reporting the highest bear harvests in 2011 were Orleans (where the Eagle Point Unit is located) with 47, Essex with 45, and Caledonia with 41. Only one bear was harvested from the town of Derby during the 2011 season. This one bear represented 2.1 percent of the bears killed in Orleans County and 0.25 percent of all the bears harvested in Vermont (VTFW 2012c). In 2010, Orleans County again reported the highest bear harvest of any county in Vermont, with 79 bears taken. Only 3 bears were harvested in the town of Derby in 2010, which represented 3.8 percent of the bears killed in Orleans County, and 0.56 percent of all the bears taken in Vermont (VTFW 2011b).

Mast production influences the distribution of bears across the landscape. Annual surveys of both soft (soft juicy berries, wild cherries, and apples) and hard (beechnuts, acorns, and hazelnuts) mast conducted by VTFW biologists indicated that food availability may have played a role in the high bear harvest in 2010 as well as the decline in harvest in 2011. Beech nut production was higher than normal in 2011 Bear harvests tend to be lower when beech mast is high, since bears travel less, forage at higher elevations, and spend more time in remote locations, making them less susceptible to hunter harvest. Therefore, the reduction in harvest of bears from 2010 to 2011 likely represents a redistribution of bears into areas that are more difficult to hunt, rather than a population decline (VTFW 2012c).

With this alternative, the Service proposes to continue black bear hunting on the Eagle Point Unit following the State's seasons and regulations. During the 15-year period of 1996 to 2010, a total of 37 bears were harvested in the town of Derby, Vermont. The range was 0-6 bears harvested per year, resulting in an average annual harvest of 2.5 bears per year (Hamelin 2012, personal communication). Only 29 percent of the Unit is forested and, therefore, suitable for treeing a bear using dogs. This coupled with the small size of the property and its close proximity to the Canadian border, will likely discourage bear hunters from using dogs to hunt there. The small acreage of the Eagle Point Unit, and the low numbers of bears typically harvested in Derby make it highly unlikely that continued hunting will have a negative impact on local or regional bear populations.

Wild Turkey: Vermont's current wild turkey population is estimated to be between 45,000 to 50,000 birds in the fall. Throughout the 1990s and into the early 2000s, Vermont's turkey population experienced a dramatic increase in numbers. Long-term harvest trends and hunter effort suggest that the population may now be stabilizing near peak historic levels. According to the Vermont Wildlife Action Plan, turkey are considered abundant and used as an example of successful wildlife and habitat management in the State (Kart et al. 2005).

Wild turkeys occur throughout Vermont and are hunted in all 24 WMUs during the spring season, and 21 of the 24 WMUs in the fall season. In 2011, 17,886 hunters harvested a total of 5,231 turkeys in Vermont during the spring and fall seasons, combined (VTFW 2012d). This harvest was 24 percent below the 2010 harvest of 6,877 turkeys, and 10 percent below the average annual turkey harvest of 5,800 birds. As in most years, the majority (90.8 percent) of turkeys were harvested during the spring season (VTFW 2011c).

In Orleans County, 349 turkeys were harvested in 2011, with 15 of them from the town of Derby, where the Eagle Point Unit is located. Turkeys from Orleans County represented 6.7 percent of all turkeys harvested in Vermont, whereas those harvested in Derby represented 0.29 percent of the years' Statewide harvest (VTFW 2012d). In 2010, 7.5 percent of turkeys harvested in Vermont were from Orleans County, with 0.41 percent from the town of Derby (VTFW 2011c).

The 2011 spring turkey season harvest was 4,755 birds, with 293 (6.1 percent) turkeys harvested in Orleans County, 13 of which came from Derby, Vermont. In WMU D1, where the Eagle Point Unit occurs, 266 turkeys, or 0.77 turkeys per square mile of habitat, were harvested. Spring turkey harvest throughout Vermont's WMUs ranged from 0.16 to 5.00 turkeys harvested per square mile of habitat. Vermont's resident hunters accounted for 93 percent of the spring harvest (VTFW 2012d).

Vermont's 2011 fall season harvest was 20.2 percent below that of 2010, when WMUs D1, D2, B, and H1 were opened for the first time to fall hunting (VTFW 2010 Wild Turkey Harvest Report). In 2011, 476 turkeys were harvested Statewide, with 56 (11.8 percent) being from Orleans County, and 2 coming from Derby. WMU D1 had the second highest fall turkey harvest of any WMU in the State, with 45 turkeys being harvested there during 2011. The overall 2011 decrease in fall harvest was a consequence of the plentiful beechnut crop; it caused turkeys to spread out over the landscape, in remote areas, that were further away from hunters (VTFW 2012d).

Research has shown that short-term turkey population fluctuations can result from combinations of extreme environmental conditions (i.e. rainfall, temperature) that can negatively affect egg hatching, poult survival, and winter survival of adults. Turkeys in Vermont are living at the northern extreme of their continental range and are more vulnerable to natural mortality from severe winters and cold, wet springs. Long-term population trends, however, are primarily influenced by changes in the quantity and quality of suitable habitat across the landscape.

Although the eastern wild turkey is primarily regarded as a forest-dwelling bird, ideal turkey habitat includes open land too. Turkey populations are more stable and nesting rates are consistently higher in a mosaic of habitats consisting of both forests and fields (VTFW 2009).

Vermont, like most States, has two turkey seasons: a spring season when only bearded birds (males) are harvested, and a fall season when either sex may be legal game. Since turkeys are polygamous, spring gobbler seasons have little impact on breeding success and size of turkey populations. Fall hunting is allowed when a population is sufficiently large to withstand increased mortality. The VTFW will continue to emphasize high-quality spring hunting as a management tool to sustain healthy, abundant wild turkey populations in Vermont that are below the biological carrying capacity. While there is inherent variation in both annual production and survival of wild turkeys, fall either-sex hunting can play a pivotal role in regulating population size. Vermont's experience with fall turkey hunting in Grand Isle and Franklin counties in the mid-1980s demonstrated how quickly heavy fall harvests can reduce turkey populations (VTFW 2009).

With this alternative, the Service proposes to continue wild turkey hunting on the Eagle Point Unit following the State's seasons and regulations. The amount of available turkey habitat (approximately 0.5 mi^2) on the Eagle Point Unit, combined with the low numbers of turkey typically harvested in Derby (97 turkeys were harvested during 2006 through 2010), make it unlikely that hunting there will have a negative impact on local or regional wild turkey populations (Hamelin 2012, personal communication).

Moose: In 2011, Vermont's moose post-hunt population was around 3,000 animals Statewide, which meets the State's objective of 3,000 to 5,000 moose, outlined in Vermont's 2010-2020 Big Game Management Plan. The State's moose numbers have slowly increased since the late 1970s, with estimations of 2,100 moose in 1997, and 4,000 moose in 2007. During the 1980s, timber harvesting increased significantly and generally had a favorable impact on moose, especially in the Northeast Kingdom. The overall goal of moose management in Vermont is to maintain healthy, viable, regional populations of moose at or below carrying capacity (VTFW 2009).

Moose, like white-tailed deer, play a significant role in the ecology of Vermont's forests. The population and density of moose in a given area affects the health of the animals, the sustainability of its habitat, and determines the probability of human and animal conflicts. Because of the significant role moose play in both an ecological as well as social context in the State, it was placed (along with white-tailed deer and beaver) in a special category for consideration in the Vermont State Wildlife Action Plan (Kart et al. 2005). Moose are another example of successful wildlife and habitat management in the State where once extirpated, populations have increased to allow a regulated hunting season.

Moose prefer thick, brushy habitats and use lowland softwood forests, hardwood forests, and mixed forests at different times of the year. While white-tailed deer have been estimated to eat between 4 and 10 pounds of plant matter each day, moose may eat more than 40 pounds per day. In winter, both species prefer the twigs of many hardwood and softwood trees. But in the summer and fall, deer switch to a variety of herbaceous plants, along with fruits, nuts and seeds, while moose continue to feed on hardwood and softwood trees, and aquatic vegetation found in or near swamps, bogs, and wet forest edges (VTFW 2009).

The VTFW sets different density objectives (moose per square mile) for different regions of the State, and allows regulated hunting seasons, in order to achieve optimum habitat conditions for a healthy moose population. In the early 2000s, a high density of moose (3.0 moose per square mile) in WMU E caused significant damage to forests due to overbrowsing. Increases in the number of hunting permits issued in WMU E and adjacent WMU D2, were used to lower the number of moose to the biological carrying capacity of the habitat. Today, Vermont's Big Game Management Plan (2010-2020) calls for maintaining moose densities of 1.75 moose per square mile in WMU E, 1.0 moose per square mile in WMU D2, and 0.5 moose per square mile or less, in all other units, including WMU D1, where the Eagle Point Unit is located (VTFW 2009).

In 2011, hunters harvested 252 moose in the State of Vermont. Of the 11,217 permit applications that were received for the regular moose season lottery, 405 permits were allotted to hunters, 90 percent of which were Vermont residents. In addition, Vermont held its first ever archery-only moose season, in which 53 permits were issued and 16 moose were harvested. In WMU D1, 40 hunting permits were issued by the VTFW, and 14 moose were harvested within its 376 mi^2 area. The moose harvested in WMU D1 represents 5.5 percent of the total moose harvested in the State of Vermont. During 2011, there were no moose harvested in the town of Derby, where the Eagle Point Unit is located (VTFW 2012e), however, from 2006 to 2010, a total of 6 moose were harvested there (Hamelin 2012, personal communication).

In 2010, 484 moose were harvested in Vermont. WMU D1 had a success rate of 75 percent, the highest of any WMU in Vermont. Of the 40 permits issued there, 30 were successful with 16 bulls, 13 cows, and 1 male calf taken. In 2010, according to moose hunter surveys, WMU D1 also had the highest number of moose seen per hours scouted. No moose, however, were harvested in Derby or nearby towns of Holland or Coventry. Success rates were down in WMU D1 in 2011 with only 35 percent of the permitted hunters taking a moose (VTFW 2012e).

The VTFW proposes to maintain regional moose numbers at their current levels in most areas of the State, with the exception of the Northeast Kingdom region, where numbers need to be reduced to a level below biological carrying capacity. After many years of overpopulation, the Northeast Kingdom moose herd has been reduced and the animals are generally healthier. To achieve this, a large number of hunting permits have been issued in this region since 2004 (VTFW 2011d).

This alternative (Proposed Action) would allow the continuation of moose hunting on the Eagle Point Unit following State of Vermont seasons and regulations. Allowing hunters the opportunity to harvest moose on the Eagle Point Unit is consistent with the VTFW goals and objectives outlined in the Vermont Big Game Management Plan 2010-2020.

Land cover in the Eagle Point Unit, as well as the western portion of Derby, consists of a patchwork of residential and commercial development interspersed with open agricultural land. The Eagle Point Unit, however, abuts a significant block of undeveloped heavily forested conservation land in the province of Quebec. This land, when combined with the adjacent wetlands and forest of the Eagle Point Unit, provides some of the home range requirements of moose. Overall the small acreage of the Eagle Point Unit, lack of forested habitat within it, and low numbers of moose typically harvested in Derby, make it unlikely that hunting there will have a negative impact on local or regional moose populations

The Service concludes that it is highly unlikely that the harvest of big game species on the Eagle Point Unit will have any significant negative impacts to local or regional populations. Hunting white-tailed deer and moose on the Eagle Point Unit may contribute to State population and carrying capacity goals for these species, as well as reduce browse pressure on plants in the surrounding area.

c. Migratory Game Birds

The Service annually prescribes frameworks, or outer limits, for dates and times when migratory bird hunting can occur, the number of birds that can be taken, and the number of birds in possession by a hunter. These frameworks are necessary to: (1) allow State selections of seasons and limits for recreation and sustenance, (2) aid Federal, State, and Tribal governments in the management of migratory birds, and (3) permit harvests at levels compatible with population status and habitat conditions. Because the Migratory Bird Treaty Act stipulates that all hunting seasons for migratory game birds are closed unless specifically opened by the Secretary of the Interior, the Service annually promulgates regulations (50 CFR Part 20) establishing the frameworks from which states may select season dates, bag limits, shooting hours, and other options for each migratory bird hunting season. The frameworks are essentially permissive in that hunting of migratory birds would not be permitted without them. Thus, in effect, Federal annual regulations both allow and limit the hunting of migratory birds (USFWS 2012a).

The annual process of setting duck-hunting regulations in the United States is based on a system of resource monitoring, data analyses, and rule making. Each year, monitoring activities such as aerial surveys and hunter questionnaires provide information on harvest levels, population size, and habitat conditions. Data collected from this monitoring program are analyzed each year, and proposals for duck-hunting regulations are developed by the Flyway Councils, states, and the Service. After extensive public review, the Service announces a regulatory framework within which states can set their hunting seasons (USFWS 2012a).

Ducks, Coots, and Mergansers: Dabbling ducks (mallard, black duck, American wigeon, northern pintail, gadwall, green-winged teal, blue-winged teal, and northern shoveler) are the most abundant and widespread group of ducks in North America and are of greatest importance for sport hunting and viewing (Breeding Duck Population Status, Trends, and Goals). The 2010 Waterfowl Breeding Population and Habitat Survey (that examines more than 2 million square miles of waterfowl habitat across the north-central and Northeastern United States, south-central, eastern, and northern Canada, and Alaska) estimated a population of 40.9 million waterfowl. This number was similar to the 2009 estimate of 42 million birds and is 21 percent above the long-term average (Zimpfer et al. 2010)

Waterfowl are managed by "flyways" which follow the major migratory routes. Vermont is part of the Atlantic Flyway which consists of states from Florida to Maine. Waterfowl population trends are monitored by the Service through the collection of data including band recoveries, hunter questionnaires, the Harvest Information Program (HIP) and wing returns, breeding population and habitat surveys and mid-winter waterfowl surveys (Caithhamer and Dobovsky, 1995). The Service designs the bag limits and season lengths to maintain healthy populations of these species.

According to the breeding population and habitat survey, mallard abundance was 12 percent above the long-term (1955 to 2009) average, green-winged teal 78 percent, blue-winged teal 36 percent, and northern shovelers 76 percent above the long-term average (Trends in Duck Breeding Populations, 1955 to 2010). The black duck population in eastern North America decreased for three decades before reaching an all-time low in the 1980s. In 2010, black duck breeding population estimates were below the long-term (1990 to 2009) average and below the planned population goals (Zimpfer et al. 2010).

During the 2009 and 2010 waterfowl hunting season in the Atlantic Flyway, mallards, wood ducks, and green-winged teal were the most harvested duck species. The total harvest was estimated at 1,857,300 ducks with 183,100 active duck hunters spending approximately 1,072,400 days in the field. A similar trend showed in Vermont during 2009 and 2010, with mallards, wood ducks, and green-winged teal the most commonly harvested duck species, followed by common goldeneyes, black ducks, and ring-necked ducks. Vermont's 2,700 active duck hunters constituted only 1.4 percent of the duck hunters within the Atlantic Flyway. They spent approximately 17,300 days in the field, and harvested approximately 22,900 ducks (1.2 percent of the Atlantic Flyway harvest) in 2010 (Raftovich et al. 2011).

The Eagle Point Unit offers limited waterfowl hunting opportunities within wetland areas of the property, along the entire portion of Hall's Creek, a small portion of the John's River, and a 1-mile long portion of the shoreline of Lake Memphremagog. However, only about 19 acres of open water exist (including a 2-acre farm pond) out of the 150 acres of wetland habitat on the tract. This necessarily limits the amount of hunter use within the wetland habitat on the property.

Waterfowl hunting in Vermont changes as the season progresses. During the October portion of the duck season in Vermont, most hunting is for mallards, wood ducks, black ducks, and green-winged teal on shallow-water marshes, beaver flows, ponds and rivers. As marshes begin to freeze in November, open-water hunting for migrating common goldeneye, lesser and greater scaup, and bufflehead becomes more common (VTFW 2007l).

The migratory waterfowl in the Lake Memphremagog Basin are a very small part of a large population of birds that are managed by the Service on a flyway basis. The Eagle Point Unit contains approximately 150 acres of wetland habitat, much of which is flooded bottomland forest and intermediate fen which are not typically used for hunting waterfowl. Due to the small size of the tract and the limited places for duck hunting to occur there, waterfowl hunting on the Eagle Point Unit would be negligible on the State, regional, or Atlantic Flyway population levels of ducks, coots, or mergansers.

Canada Goose, Snow Goose, and Brant: Canada geese, snow geese, and brant are also managed by "flyway." The Service designs the bag limits and season lengths to maintain healthy populations of these species.

A total of 190,300 breeding pairs of AP Canada geese were estimated from Waterfowl Breeding Population and Habitat Survey during June 2012, yielding an estimate population similar to 2011. During this year's survey, half of the indicated pairs were observed as single birds, indicative of an average nesting effort. The breeding population of AP Canada geese has been stable for the past 10 years (USFWS 2012b). In addition, Vermont's Breeding Bird Atlas indicated that from the time of the first atlas (1976 to 1981) to the second breeding bird atlas (2003 to 2007), resident Canada goose were shown to increase across all biophysical regions of Vermont by 1,600 percent, respectively (VCE 2012).

Greater snow geese are the most abundant light goose population in the Atlantic Flyway. The preliminary estimate from 2012 spring surveys was 1,005,000 birds which is twice the size of the population objective of 500,000 birds. Atlantic brant populations are measured during January surveys on their Atlantic Flyway coastal wintering grounds. In the 2012 Mid-Winter Waterfowl Survey, 149,200 brant were counted, which was similar to the 2011 estimate (USFWS 2012b).

During the 2009 and 2010 waterfowl hunting season in the Atlantic Flyway more Canada geese were harvested (854,268 and 796,229, respectively) than any other species of waterfowl. Over 183,000 active goose hunters spent more than a million days in the field each year. A similar trend showed in Vermont during 2009 and 2010, with Canada geese being the most commonly harvested waterfowl species. Hunters shot 11,700 Canada geese in 2009 and 9,700 Canada geese in 2010, which amounted to 1.4 percent and 1.2 percent of the Atlantic Flyway harvest (Raftovich et al. 2011).

Vermont's 2,100 active goose hunters constituted only 1.1 percent of the goose hunters within the Atlantic Flyway. Goose hunters in Vermont spent approximately 14,000 and 9,300 days in

the field in 2009 and 2010 respectively, which constitutes merely 1.4 percent and 0.9 percent of the time spent by goose hunters in the Atlantic Flyway (Raftovich et al. 2011). Further, most snow geese migrate along the Champlain Valley and have increasingly been moving towards New York State during fall migration, likely due to the increased crop production in that state (Crenshaw 2012). As a result, opportunities for harvesting snow geese on the Eagle Point Unit are opportunistic at best and represent a very small fraction of the numbers which migrate through Vermont.

The migratory waterfowl in the Lake Memphremagog Basin are a very small part of a large population of birds that are managed by the Service. The Eagle Point Unit has limited goose hunting opportunities within the grassland fields of the tract. Brant hunting most likely would be opportunistic, when hunters are on Lake Memphremagog (not part of the Eagle Point Unit), hunting for other waterfowl species. Due to the small size of the tract, the limited places for goose hunting, and the erratic occurrence of brant in the State, no adverse impacts on State, regional, or Atlantic Flyway populations are expected.

American Woodcock: The American woodcock is a trust species managed by the Service. It has been categorized as a "species in decline" and is listed as a "Species of Greatest Conservation Need" in the Vermont State Wildlife Action Plan (Kart et al. 2005). Woodcock are managed in two distinct units: the Eastern Unit that consists of 17 eastern states from Georgia to Maine, and the Central Unit that includes 18 states from Texas to Minnesota. Their population trends are monitored by the Service through the collection of data including the HIP woodcock harvest survey and wing returns. The Service designs the bag limits and season lengths to maintain healthy populations of these species.

American woodcock have specific early successional habitat requirements, and the population is limited by those habitats. The woodcock's home range is around 25 acres. Ideal habitat within that range must consist of two distinct types of cover. Young (e.g. speckled alder, gray dogwood) forests with moist soils are required for nesting, brood rearing, and feeding, while brushy fields and forest openings are necessary for roosting and courtship (VTFW 2007m).

In Vermont, as in other areas of the northeast, the landscape has changed dramatically from open farmland to mature forests. The loss and degradation of early successional habitat is considered to be the most important factor for these population declines (USFWS 1990). Vermont is within the core range of American woodcock habitat. American woodcock prefer early successional habitat that contains young speckled alder or gray dogwood as well as brushy fields and open fields for various stages of their life cycle. Vermont's Breeding Bird Atlas indicated that woodcock occurred in 63 percent of the Northern Vermont Piedmont region, where the Eagle Point Unit is located (VCE 2012). Speckled alder habitat is present in small (<25 acres) scattered patches on Eagle Point. Openings for courtship displays are plentiful, but protective cover for feeding, nesting, and brood-rearing is lacking (VTFW and USFWS (Draft) 2012).

Although the American Woodcock Management Plan, written by the Service (1990), focuses on habitat management, it acknowledges that managed recreational harvest of woodcock is desirable and consistent with conservation. Therefore, recreational hunting will continue to be managed under existing regulatory processes in the United States. According to the HIP, which was initiated to improve the information available to the Service on hunter numbers and harvest success across each state for all migratory birds, there were approximately 6,200 woodcock harvested in Vermont during the 2010-2011 hunting season. Vermont's woodcock harvest during this time represented 6.2 percent of the woodcock harvested in the Eastern management area, and 1.9 percent of the woodcock harvested nationally. During the 2010-2011 season, an estimated 1,300 active woodcock hunters in Vermont spent around 5,400 days hunting woodcock in the field. The amount of hunter effort in Vermont represents 3.7 percent of the effort in the Eastern management area, and 1 percent of the total hunter effort nationwide (Raftovich 2012).

McAuley et al. (2005) noted that hunting mortality was not a significant impact relative to other sources and that habitat loss was still considered to be critical in the decline of woodcock populations. Pennsylvania implemented very restrictive season lengths in 1984 (21 days) and further restricted the seasons in 1992 (14 days) in an attempt to protect the Pennsylvania breeding population of woodcock. Unfortunately, from 1985 to 1995 the singing-ground surveys in Pennsylvania declined 4.6 percent annually compared to a flyway decline of 2.0 percent. This indicates that the restrictive season lengths had little to no effect on woodcock in Pennsylvania or that other factors contribute to the State population decline (Bruggink and Kendall 1995).

This finding supports the theory that habitat deterioration is the major problem affecting woodcock in the Eastern United States. More restrictive bag limits and season lengths other than those already in effect are not currently supported by the literature as an effective means to protect populations of woodcock. The limited amount of habitat available for woodcock on the Eagle Point Unit is small compared with the surrounding landscape, and is expected to have a negligible impact on the local, regional or the flyway population.

Wilson's snipe: Wilson's snipe is a trust species managed by the Service. Like other migratory birds, snipe are managed by "flyways." Their population trends are monitored by the Service through the collection of data including the HIP snipe harvest survey. The Service designs the bag limits and season lengths to maintain healthy populations of these species.

Although it is a migratory gamebird, snipe receive very little hunting pressure in Vermont. Snipe harvested in Vermont are likely incidental take by sportsmen engaged in hunting other species; therefore, hunting is expected to have little impact on the local, State, or flyway Wilson's snipe population.

According to the HIP, there were approximately <50 Wilson's snipe harvested in Vermont during the 2009 hunting season. Vermont's snipe harvest was negligible during this time and represented < 0.1 percent of those harvested in the Atlantic Flyway, and <0.05 percent of the 83,500 snipe harvested nationally. During the 2010 season, the sample size of snipe harvested

was insufficient to provide a reliable estimate, so the long-term (1999-2010) average harvest of 200 snipe was used. The amount of hunter effort in Vermont represents <0.1 percent of the total hunter effort nationwide (Raftovich 2011).

Any Wilson's snipe occurring at the Eagle Point Unit in Vermont is a very small part of a population of birds that is managed by the Service on a flyway basis. The Eagle Point Unit contains approximately 150 acres of wetland habitat, some of which is flooded bottomland forest and intermediate fen which are not typically used for snipe hunting. Due to the small size of the tract and the limited places for hunting to occur there, Wilson's snipe hunting on the Eagle Point Unit would be negligible on the State, regional, or Atlantic Flyway population levels.

The Service is responsible for managing migratory birds including the development of harvest regulations which can be sustained for species on a flyway scale. Annual NEPA considerations for waterfowl hunting frameworks are covered under a separate EA, "Duck Hunting Regulations for 2006-07," and an August 24, 2006, Finding of No Significant Impact. Further, in a notice published in the September 8, 2005, Federal Register (70 FR 53376), the Service announced its intent to develop a new supplemental environmental impact statement for the migratory bird hunting program. Public scoping meetings were held in the spring of 2006, as announced in a March 9, 2006, Federal Register notice (71 FR 12216). More information may be obtained from: Chief, Division of Migratory Bird Management, U.S. Fish and Wildlife Service, Department of the Interior, MS MBSP-4107-ARLSQ, 1849 C Street, NWR, Washington, DC, 20240.

In summary, by following Federal and State regulations, the harvest of migratory bird species on the Eagle Point Unit will be minimal due to the small size of the tract and the limited habitats available for migratory birds there. The Service concludes that it is highly unlikely that the harvest of these species will have any direct significant impact to local, regional, or flyway populations.

d. Endangered, Threatened, and other Non-game species

No anticipated direct, indirect, or cumulative impacts to federally endangered, threatened, or non-game species are expected to occur on the Eagle Point Unit of the Missisquoi NWR. Vermont has five federally threatened or endangered species that receive legal protected under the ESA of 1973 (ESA; 7 U.S.C. § 136, 16 U.S.C. § 1531 et seq.), as administered by the Service and the NOAA. However, no listed species are known to occur in Orleans County where Eagle Point is located. Consultation resulted in a finding of 'no effect' obtained from the Service's New England Field Office in 2013. Therefore, no federally threatened or endangered species inhabit the Eagle Point Unit. Continuing to hunt there would not adversely impact any federally threatened or endangered species.

There are two State-endangered species—the bald eagle and an unidentified plant species—that are legally protected under the Vermont endangered species statute {10 V.S.A. Ch. 123 section 5401}, as administered by the ANR. The State-endangered plant species is not identified in this

report or the LRMP due to data sensitivity concerns. Land managers are aware of this species and the threats to it including changes in water quality, vegetative succession, and competition from emergent vegetation. No potential threats to the species would occur by allowing hunting on the Eagle Point Unit. Spring and summer hunting seasons would have no impact on this species; by the time fall hunting seasons occur on the unit, the plants would have already died back and become dormant (Hamelin 2012, personal communication).

Most hunting on the Eagle Point Unit will occur during the fall (August through December). Spring turkey hunting (May 1 to 31) and coyote hunting (year-round), however, will occur during the prime nesting season for grassland birds and other non-game species. Vermont's spring turkey hunting season occurs during the month of May, with legal hunting hours from one-half hour before sunrise to noon, each day. Turkey hunter effort is greatest on the opening day and gradually wanes as the season progresses. After about 2 weeks, hunter activity decreases substantially due in part because the most accessible birds have been harvested, the peak breeding season has passed, and it is more difficult to call and attract turkeys.

The small size of the unit as well as the topography and juxtaposition of land cover types on it, limits the number of turkey hunters that can effectively hunt there. It is thought that the Eagle Point Unit would host, at most, only one or two turkey hunting parties per day on the first two weekends in May, a minimal intrusion during the period of grassland bird territory and nest establishment. In order to avoid being spotted by their prey, turkey hunters avoid walking in fields and open areas, generally moving through the forest, on trails, or along brushy fence lines to scout and access their hunting location. Turkey hunting is conducted from a camouflaged, sedentary position which would not disturb grassland birds, and most hunters take their positions in pre-dawn hours when birds are inactive. Hunters exiting their hunting locations may flush some grassland birds from potential nest sites, but this infrequent disturbance would be prior to egg incubation and would have negligible impacts. Due to the expected low density of hunters and uncommon frequency of spring turkey hunting on the Eagle Point Unit, any disturbance to non-target birds and resident wildlife from associated hunter activity is expected to be negligible (Hamelin 2012, personal communication).

Due to the small size of the Eagle Point Unit, coyote hunting there is expected to be mainly opportunistic, when hunters are on the property scouting for, or hunting other species, like deer, during the fall season. The size of the tract and its close proximity to the Canadian border, make it unlikely that coyote hunters would use dogs to hunt there. It is unlikely that significant disturbance to nesting non-game birds and resident wildlife from coyote hunting in the spring would occur on the Eagle Point Unit.

Although the Service owns the property, the Eagle Point Unit will be managed in a manner similar to a state WMA by the VTFW. The VTFW manages 85 WMAs (including the nearby South Bay and Willoughby Falls WMAs) totaling more than 118,000 acres throughout the State. WMAs play an important role in meeting the VTFW's mission for the conservation of all species of fish, wildlife, and plants and their habitats for the people of Vermont, in addition to providing

access for wildlife-based activities such as hunting, fishing, trapping, and wildlife observation. Continuing to hunt the Eagle Point Unit according to the State seasons and regulations would not adversely impact populations of State-threatened or endangered species that occur there. In addition, hunting is unlikely to affect any non-game or resident wildlife, or diminish the overall species diversity of the unit.

3. Local Economy

The Northeast Kingdom of Vermont and Lake Memphremagog, in particular, are already well-known for quality hunting and fishing opportunities in the State. This alternative will provide additional recreational opportunities to hunters from all over Vermont, and possibly other states as well. The purchases of gas, food, lodging, hunting licenses, equipment, and supplies from hunting at the Eagle Point Unit will contribute positively to the local economy. As hunters and wildlife enthusiasts spread the word to their friends about hunting and recreational opportunities in the area, positive impacts to the local economy will continue.

4. Cultural Resources

The Service's policy is to preserve cultural, historic, and archaeological resources in the public trust, and avoid any adverse effects wherever possible. Consultation with the Vermont DHP indicates that there are no recorded archaeological sites on the Eagle Point property. DHP staff and several local archaeology consultants note that although the area is considered to be highly sensitive archaeologically, very little systematic survey work has been done there. Hunting on the Eagle Point Unit is an existing use that does not require the development of new trails, roads, or other facilities; therefore, it will not have a negative effect on the property's cultural or historic resources (USFWS 2010).

B. Alternative 2: Continue to hunt the Eagle Point Unit of the Missisquoi NWR, following State of Vermont seasons and regulations, with the exceptions of: (1) no spring turkey hunting, and (2) rifle deer hunting from a tree stand only.

Under this alternative the opportunity for recreational hunting on the refuge would decrease. There would be no hunting for spring turkey and deer hunting with rifles would be permitted only from portable tree stands.

1. Vegetation

The impacts of this alternative on habitat and plants would be similar or smaller than those for Alternative 1. The physical impact of hunters on the vegetation could be less due to the elimination of spring turkey hunting, though probably not by much. The small size of the unit as well as the topography and juxtaposition of land cover types on it, already limit the number of turkey hunters that can effectively hunt there. It is thought that the Eagle Point Unit would host,

at most, only one or two turkey hunting parties per day on the first two weekends in May (Hamelin 2012, personal communication).

2. Wildlife

The impacts of this alternative on the wildlife populations of the refuge are discussed below.

a. Small Game

The impact of this alternative to small game would be the same as Alternative 1.

b. Big Game

White-tailed Deer: The impacts of this alternative on white-tailed deer would be similar to those for Alternative 1, however, with the added restriction of using a deer stand while rifle hunting, it is possible that fewer hunters would participate in rifle hunting on the unit. Given the fact that most deer (48 percent in 2011; 43 percent in 2010) are harvested during the rifle season in Vermont, the number of deer removed from the Eagle Point Unit could decrease with this alternative (VTFW 2012b; VTFW 2011a).

If hunting pressure decreased and deer numbers increased at the Eagle Point Unit, competition for food would result in an over-browsed forest understory, damaged habitats, and possibly unhealthy deer. With an increase in the local population of deer, it may be necessary for them to move onto adjacent private properties for food, causing crop and property damage there. Given the small size of the property and the fact that deer hunting pressure would still occur there, it is not anticipated that this restriction would have any impact on the State's deer population as a whole (Hamelin 2012, personal communication).

Wild Turkey: The VTFW emphasizes high-quality spring turkey hunting as a management tool to sustain healthy, abundant wild turkey populations in Vermont that are below the biological carrying capacity. Vermont, like most states, has two turkey seasons: a spring season when only bearded birds (males) are harvested, and a fall season when either sex may be legal game. During 2011, 90.8 percent of all harvested turkeys were taken during the spring season. The youth hunting weekend in April accounted for 12.0 percent of the birds harvested during the spring. Since turkeys are polygamous, spring gobbler seasons have little impact on breeding success and size of turkey populations (VTFW 2012d).

In 2010, WMU D1, where the Eagle Point Unit is located, was opened for the first time to fall turkey hunting. Fall hunting is allowed when a population is sufficiently large to withstand increased mortality. While there is inherent variation in both annual production and survival of wild turkeys, fall either-sex hunting can play a pivotal role in regulating population size (VTFW 2009).

The Eagle Point Unit, excluding marshes and open wetlands, contains approximately 0.5 mi^2 of turkey habitat. Using the 2010 harvest rate of 0.88 turkeys per mi^2 of habitat in WMU D1, the Eagle Point Unit harvest rate would be around 0.44 turkeys per year, or about one bird harvested every other year (Hamelin 2012, personal communication). Therefore, the elimination of a spring turkey hunt on the Eagle Point Unit will not materially affect the size of local or regional populations of wild turkeys in Vermont.

c. Migratory Game Birds

The impacts of this alternative to migratory game birds would be the same as Alternative 1.

d. Endangered, Threatened, and other Non-game species

The impacts of this alternative will have no effect on endangered or threatened species on the Eagle Point Unit. As stated earlier, there are no known federally listed threatened or endangered species in Orleans County where the Unit is located. The impacts to non-target birds and resident wildlife on the Unit could be equal to or slightly less than those for Alternative 1, due to the elimination of spring turkey hunting. Vermont's spring turkey hunting season begins with youth hunting during the last weekend in April and occurs from May 1 to 31, with legal hunting hours from one-half hour before sunrise to noon, each day. Turkey hunter effort is greatest on the opening day and gradually wanes as the season progresses. After about 2 weeks in May, the hunter activity decreases substantially due in part because the most accessible birds have been harvested, the peak breeding season has passed, and it is more difficult to call and attract turkeys. Because spring turkey hunting would not be permitted there would be no additional impacts to non-game species.

The small size of the unit as well as the topography and juxtaposition of land cover types on it, limit the number of turkey hunters that can effectively hunt there. It is thought that the Eagle Point Unit would host, at most, only one or two turkey hunting parties per day on the last weekend in April, and the first two weekends in May, a minimal intrusion during the period of grassland bird territory and nest establishment. In addition, in order to avoid being spotted by their prey, turkey hunters avoid walking in fields and open areas, generally moving through the forest, on trails, or along brushy fence lines to scout and access their hunting location. Turkey hunting is conducted from a camouflaged, sedentary position which would not disturb grassland birds, and most hunters take their positions in pre-dawn hours when birds are inactive. Hunters exiting their hunting locations may flush some grassland birds from potential nest sites, but this infrequent disturbance would be prior to egg incubation and would have negligible impacts (Hamelin 2012, personal communication).

3. Local Economy

The impacts of this alternative to the local economy should be similar to those in Alternative 1. Eliminating spring turkey hunting on the Eagle Point Unit may mean fewer turkey hunters

purchasing gas, food, and supplies from the local area during the spring. Since the Eagle Point Unit is small and has limited turkey habitat, it is thought that only one or two turkey hunting parties (of one or two people each) per day, during the youth weekend in April, and the first two weekends in May, would be the extent of spring turkey hunting there (Hamelin 2012, personal communication). Therefore, the loss to the local economy probably would be minor. Since the Eagle Point Unit is located in WMU D1, one of the 21 WMUs open to fall turkey hunting, it is possible that fall turkey hunters may offset some or all of the potential loss to the local economy that may occur during the spring.

Limiting rifle hunting to a tree stand only, may have a small impact on the local economy. During 2011, 48 percent of successful hunters used a rifle to harvest their deer, 22 percent used a bow and arrow, and 17 percent used a muzzleloader. It is not known what percentage of hunters used a tree stand (VTFW 2012b). The requirements for tree stand rifle hunting may reduce the number of rifle hunters to the unit, resulting in a decrease in the purchase of local gas, food, lodging, and supplies. On the other hand, it is possible that requiring tree stand rifle hunting may improve the quality of the hunt and hunter satisfaction, thus bringing more rifle hunters to the unit.

4. Cultural Resources

This alternative requires no development of new trails, roads, or other facilities, and therefore, will not have a negative effect on the cultural and historic resources at the Eagle Point Unit.

2. Cumulative Impact Analysis

A. Anticipated Direct and Indirect Impacts of Proposed Hunt on Wildlife Species

1. Alternative 1 (Proposed Action): Continue to hunt the Eagle Point Unit of the Missisquoi NWR, following State of Vermont seasons and regulations.

A. Vegetation

The continuation of deer and moose hunting on the Eagle Point Unit may have positive impacts on trees, shrubs, and other vegetation, as well as other wildlife species that rely on them. Browsing by deer and moose is a natural aspect of Vermont's forest ecology, but too many deer and/or moose in a given area can cause problems for plant growth, forest regeneration, and nearby landowners (VTFW 2009).

Possible negative impacts of the proposed activity include temporary trampling of vegetation and light soil erosion, however, most hunting (waterfowl, deer, bear, moose, rabbit, squirrel, grouse, bobcat, fox, and raccoon) occurs during the fall and winter months, when plants are dormant, or the ground is frozen or covered in snow. In Vermont, youth turkey season is the last weekend in April. Spring turkey season lasts the entire month of May, and could cause some trampling

effects to growing plants, especially in wet areas. These effects are expected to be minimal though, since the topography and juxtaposition of land cover types on the unit effectively limit the distribution of competing gobblers, as well as the number of hunters who can effectively hunt there (Hamelin 2012, personal communication). Refuge regulations prevent tree branch pruning or hammering nails or spikes into trees, therefore under refuge ownership, some protections to the vegetation are offered that were absent under private ownership. For these reasons, cumulative negative impacts to plant communities and soils are not likely to be significant during either the fall or spring hunting seasons.

B. Wildlife

1. Small game

The VTFW has the responsibility of establishing season length and harvest limits for all upland small game species hunted in the State of Vermont. In order to do this, the VTFW routinely assesses population parameters and habitat conditions when making determinations regarding how many, of which species, can be harvested. As a result, the continuation of hunting on the Eagle Point Unit following State of Vermont seasons and regulations should not create any unforeseen threats to upland small game species in the State.

Ruffed Grouse: Ruffed grouse are the most widely available upland game species in Vermont; some of the best grouse hunting in the State occurs in the Northeast Kingdom, where the Eagle Point Unit is located. The population of grouse in Vermont is thought to be stable, fluctuating in cycles, as grouse populations do throughout the entire northern part of their range. Although some suitable habitat is found in forested areas of the Eagle Point Unit, its small size and even smaller amount of preferred grouse habitat will limit the number of grouse, and thus the number of grouse hunters. Therefore, grouse hunting on the Eagle Point Unit is expected to have no cumulative negative effects on regional or State grouse populations.

Other Small Game: Other small game species that are hunted in Vermont include: eastern cottontail, snowshoe hare, gray squirrel, crow, bobcat, red fox, gray fox, raccoon, muskrat, and coyote. Populations of these small game species are stable, and none are expected to be highly sought after by licensed hunters on the Eagle Point Unit. Due to the small size of the unit, its limited habitats, and its close proximity to the Canadian border, the hunting of small game is expected to be mainly opportunistic, and negative cumulative impacts are not expected.

The Eagle Point Unit contains little to no habitat for cottontail rabbits, snowshoe hare, or gray squirrels and although some may be present, none of these species have been recently observed there. Hunting for rabbits and hares is popular in the Northeast Kingdom, but it usually involves the use of dogs, as does bobcat and raccoon hunting. The small size of the unit and its close proximity to the Canadian Border make it unlikely that hunters would use their hunting dogs there. It is likely that most hunters utilizing dogs would choose to hunt at other larger nearby WMAs rather than risk unintentionally crossing the international border. Gray squirrel hunting,

on the other hand, is not popular in Vermont. Small game species like crows, coyote, and foxes, usually are hunted opportunistically throughout the State, when hunters are out scouting for, or hunting, deer or grouse.

In conclusion, it is not anticipated that small game hunters will use the Eagle Point Unit other than opportunistically. No negative cumulative impact to local, regional, or State populations of small game species, are expected. In addition, only negligible temporary disturbances to other wildlife or plant species on the unit are expected to occur from hunting small game there.

2. Big Game

Big game species that are hunted in Vermont include white-tailed deer, black bear, wild turkey, and moose. The VTFW sets population goals for each species and has the responsibility of establishing season length and harvest limits for them (VTFW 2009). In addition, VTFW routinely assesses population parameters and habitat conditions to determine if changes are occurring that would affect big game in the State. In 2009, the VTFW finalized a 10-year Big Game Management Plan that outlines the State's management goals for 2010-2020. The continuation of big game hunting, following the State of Vermont seasons and regulations, on the Eagle Point Unit, should not create any unforeseen threats to local, regional, or State populations of these species.

White-tailed Deer: In 2011, Vermont's deer population (123,000 animals) was comfortably within the limits of the deer population goal set in Vermont's 2010-2020 Big Game Management Plan. The VTFW uses regional deer population goals to set hunting regulations, and adjusts the antlerless deer harvests, to alter the deer population levels as necessary. The VTFW also monitors biological characteristics of the deer herd, as well as the habitat, since both can change in response to deer herd size. The deer harvest in 2011 and 2010 was 12,132 and 15,523 respectively, which is below the number (17,000) of harvested deer needed to maintain a sustainable deer herd in Vermont. It is critical that deer numbers in Vermont remain at population goal levels (101,700 to 141,100 animals), in order to maintain habitats that now support a lower carrying capacity, as well as to maintain the fitness of the deer herd (VTFW 2009).

The density of deer that can be supported in an area is a value that shifts across the landscape and through time as habitat quantity and quality change. Often deer themselves are a main cause of this change as they degrade habitat when they become too numerous. For the northeast region of Vermont, where the Eagle Point Unit is located, the deer population goal is lower, at 10 to 15 deer per square mile (VTFW 2009).

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Studies from northeastern North America have found that deer density impacts vegetation. Since the mid-1900s, deer density in much of the Eastern United States, including southern Vermont, has been high enough to negatively impact forest vegetation. Long-term deer densities exceeding 20 per square mile are capable of altering forest plant communities, threatening endangered plant species, reducing ground-level hiding cover and forage for other wildlife species, and reducing abundance of nesting birds. In Vermont, high deer densities have harmful impacts on turkeys, ruffed grouse, and other forest birds since excessive browsing of shrubs reduces protective cover, food sources, and nesting sites (VTFW 2009).

According to the VTFW, the deer population in Derby, the town where the Eagle Point Unit is located, has increased dramatically since 2006 (Hamelin 2012, personal communication). In 2011, deer harvested from the town of Derby represented only 1.3 percent of the total deer harvest in Vermont; in 2010, it accounted for even less, at 1.1 percent of the total State harvest (VTFW 2012b; VTFW 2011a). The small size of the Eagle Point Unit will limit the number of deer as well as the number of deer hunters on the unit. The resulting deer harvest for any given year is, therefore, expected to be low and therefore negligible from a regional or State perspective. By following State seasons and regulations, the harvest of deer on the Eagle Point Unit is not expected to have cumulative negative impacts to the local, regional or State deer populations. The continuation of deer hunting on the unit will be critical for reducing the local impacts of deer browse on plant communities, which ultimately affects much of the wildlife on the unit.

Black Bear: In 2011, Vermont's 77-day black bear season started on September 1 and ended on November 16, overlapping the deer hunting season for 5 days. During this time, 51 percent of the bear harvest was taken by hunters specifically targeting bears (21 percent of them using dogs), while 42 percent was taken by opportunistic deer hunters. Due to abundant fall foods and a lack of deep snow that delayed hibernation, 56 percent of bears in 2011 were harvested during the month of November (VTFW 2012c).

Vermont's black bear population is healthy and growing. The number (6,300) of bears in the State has increased during the last two decades, and is now higher than the objective of 4,500 to 6,000 bears listed in Vermont's Big Game Management Plan for 2010-2020. Carefully regulated bear hunting plays an important role in managing this species by helping control the population, and allowing for the sustainable utilization of bears for food (Hamelin 2012, personal communication). The recent increase in the black bear population, combined with an expanding human population in Vermont, increases the likelihood of bear-human encounters and conflicts. During 2011, 60 non-hunting bear mortalities were reported, 7 bears were dispatched as a result of bear-human conflicts, and 179 call-outs were received by law enforcement, 119 of which were bear property damage complaints. The numbers were even greater in 2010, with 98 non-hunting mortalities reported, 11 bears dispatched, and 278 call-outs to law enforcement regarding bear-human conflicts. In order to stabilize the black bear population and lessen these effects, the VTFW has proposed to evaluate current management strategies, and hunting seasons, in an effort to increase the annual harvest of bears (VTFW 2012c).

Based on the current State bear population, recent harvest reports, and the management goals outlined in Vermont's Big Game Management Plan 2010-2020, it is highly unlikely that the harvest of bears on the Eagle Point Unit will have a significant negative impact on local or regional populations. In 2011, 33 bears, or 8.3 percent of the State harvest, were taken from WMU D1. One bear was harvested from Derby, representing 3.0 percent of the harvest in WMU D1 and 0.25 percent of the total bear harvest in Vermont (VTFW 2012c). In 2010, bear harvested in WMU D1 represented 9.6 percent of the State harvest, with those harvested in Derby accounting for 5.9 percent of Vermont's total harvest (VTFW 2011b).

Black bears harvested on the Eagle Point Unit will likely be taken opportunistically by archery or firearm deer hunters who encounter a bear on the unit during the concurrent open season for bear. Due to the small size of the parcel, proximity of the Canada border, and low bear density, bear hunting with dogs is impractical and should be a non-issue. By following State seasons and regulations, the harvest of black bears on the Eagle Point Unit is not expected to have cumulative negative impacts to the local, regional or State bear populations. Allowing hunters the opportunity to harvest a bear on the Eagle Point Unit is consistent with the VTFW goal of stabilizing the bear population and achieving the objectives of bear management, listed in the Big Game Management Plan for 2010-2020 (Hamelin 2012, personal communication).

Wild Turkey: The goal of Vermont's turkey management, as outlined in the VTFW's Big Game Management Plan 2010-2020, is to maintain wild, healthy, and abundant populations, below the biological carrying capacity, that provide both hunting and viewing opportunities for the people of Vermont. During the past three decades, wild turkeys have thrived in Vermont, with the population now at the highest level in history (VTFW 2009).

As the turkey population has increased in Vermont, so has the interest in turkey hunting. Turkey hunting opportunities have expanded to new areas of the State as the turkey population has grown. By 2004, the entire State of Vermont was opened to spring turkey hunting. In most areas of the State, there are now abundant fall turkey hunting opportunities as well (VTFW 2009).

The combined spring and fall harvest of turkeys in Vermont averages around 5,800 birds per year. The 3-year average for spring turkeys harvested per square mile in Vermont, has gradually increased from 0.31 during 2001 through 2003, to 0.39 (2003 to 2005) to 0.6 (2005 to 2007), and to 0.74 from 2006 to 2008. Increases in the State's spring turkey harvest mirrors the growth of the population. Vermont's wild turkey management emphasizes high quality spring hunting and modest fall hunting, but allows for additional fall hunting opportunities in WMUs when the spring 3-year average harvest has reached a certain level (VTFW 2009).

During the spring of 2011, the vast majority (88 percent) of the turkey harvest occurred during the regular May season; the youth (April) weekend only accounting for 12 percent of the harvest. In 2010 the youth season accounted for even less, since 95 percent of the turkey harvest occurred during May. Spring hunting (combined April weekend and May season) in Derby comprised 87

percent of the overall yearly harvest in Derby during 2011, and 61 percent of Derby's yearly harvest in 2010. Of the spring season hunters in both 2011 and 2010, 93 percent were residents of Vermont (VTFW 2012d; VTFW 2011c).

Fall (either-sex) turkey hunting can play an important role in regulating the size of the population. Population modeling and research on wild turkeys in several states indicates that significant fall hunting pressure can suppress population growth and reduce spring population densities. In Vermont, 65 to 70 percent of the fall harvest is composed of female turkeys. Fall hunting impacts the States' turkey population by reducing the number of hens that will nest next spring. This is the main reason that the fall season bag limits and season lengths are less in zones with lower turkey densities. Vermont's experience with fall turkey hunting in Grand Isle and Franklin counties in the mid-1980s demonstrated how quickly heavy fall harvests could reduce turkey populations. After the severe winter of 1993-94, the VTFW reduced fall turkey hunting opportunities in order to accelerate the population growth; turkeys increased from 12,000 to 45,000 birds from 1995 through 2002 (VTFW 2009).

Fall hunting in Vermont is regulated and limited in order to maximize spring turkey harvests. In 2011 it accounted for 9 percent of Vermont's turkey harvest, and in 2010, it comprised 20 percent of the harvest. The two fall-harvested turkeys in Derby during 2011 represented 13.3 percent of the turkeys harvested in Derby, and 0.42 percent of all fall-harvested turkeys in Vermont (VTFW 2012d). In 2010, the 11 turkeys harvested in Derby accounted for 0.79 percent of all fall-harvested turkeys in the State (VTFW 2012d; VTFW 2011c). In conclusion, by following State seasons and regulations, the continuation of spring and fall turkey hunting on the Eagle Point Unit is highly unlikely to have any cumulative negative effects on the local, regional, or State turkey population in Vermont.

Moose: The overall goal of moose management in Vermont is to maintain a healthy, viable population, consistent with biological, social, and economic goals in order to provide maximum hunting opportunities. In 2011, Vermont's moose post-hunt population was around 3,000 animals Statewide, which meets the State's objective of 3,000 to 5,000 moose. The moose density goal for WMU D1, where the Eagle Point Unit is located, is 0.5 moose per square mile (VTFW 2009).

The population and density of moose in a given area affects the health of the animals, the sustainability of its habitat, and determines the probability of human and animal conflicts (VTFW 2009). For years, high moose densities in the Northeast Kingdom of Vermont have exceeded the carrying capacity of the habitat and have negatively affected yearling cow weights. After a decade of steady declines, yearling cow weights rebounded from 2008 to 2010. This was in response to a reduced moose population due to a large number of hunting permits issued during 2002 to 2010 (VTFW 2012e). For the 2009 moose hunting season, 1,230 permits were proposed Statewide, with 940 (76 percent) of them allocated to the Northeast Kingdom WMUs of D2, E1, and E2 alone (VTFW 2009).

More than 10,000 Vermonters apply annually for a lottery moose permit. The number of moose permits available during a given year is set by the VTFW Board upon the recommendations of the VTFW. In 2011, there were 406 moose hunting permits issued in the State and in 2010, 765 were issued. In both 2011 and 2010, 90 percent of moose hunting permits were issued to Vermont residents. Forty permits were allotted for WMU D1 during both 2011 and 2010, but no moose were harvested in the town of Derby either year (VTFW 2012e; VTFW 2011d). From 2006 to 2010, a total of 6 moose were harvested in Derby (Hamelin 2012, personal communication).

Moose, like white-tailed deer, play a significant role in the ecology of Vermont's forests. As herbivores, seed dispersers, and prey, they can have a large impact on other plants and animals, as well as profound implications for the structure and function of the forest. Moose hunting remains a viable strategy for maintaining a stable moose population at or below the biological carrying capacity of the habitat. Historically, moose hunting pressure has been very light on the Eagle Point Unit since it is relatively small, and chances for success are greater in other parts of WMU D1 (Hamelin 2012, personal communication). By following State seasons and regulations, the continuation of moose hunting on the Eagle Point Unit is unlikely to have any cumulative negative effects on local, regional, or State moose populations.

The Service concludes that it is highly unlikely that the harvest of any big game species at the Eagle Point Unit will have any significant cumulative impacts to local or regional populations. The hunting of white-tailed deer and moose may have local positive effects by reducing browse pressure on plant communities and reducing human-animal conflicts.

3. Migratory Game Birds

The Service annually prescribes frameworks, or outer limits, for dates and times when migratory bird hunting may occur as well as for the number of birds that may be taken and possessed. These frameworks allow State selections of hunt seasons and take limits for recreation and sustenance; aid Federal, State, and Tribal governments in the management of migratory game birds; and permit harvests at levels compatible with population status and habitat conditions. Because the Migratory Bird Treaty Act stipulates that all hunting seasons for migratory game birds are closed unless specifically opened by the Secretary of the Interior, the Service annually promulgates regulations (50 CFR Part 20) establishing the frameworks from which states may select season dates, bag limits, shooting hours, and other options for each migratory bird hunting season. The frameworks are essentially permissive in that hunting of migratory birds would not be permitted without them. Thus, in effect, Federal annual regulations both allow and limit the hunting of migratory birds.

Migratory game birds are those bird species so designated in conventions between the United States and several foreign nations for the protection and management of those birds. Under the Migratory Bird Treaty Act (16 U.S.C. 703-712), the Secretary of the Interior is authorized to determine when "hunting, taking capture, killing, possession, sale, purchase, shipment,

transportation, carriage, or export of any … bird, or any part, nest, or egg" of migratory game birds can take place, and to adopt regulations for this purpose. These regulations are written after giving due regard to "the zones of temperature and to the distribution, abundance, economic value, breeding habits, and times and lines of migratory flight of such birds, and are updated annually (16 U.S.C. 704(a))." This responsibility has been delegated to the Service as the lead Federal agency for managing and conserving migratory birds in the United States. Acknowledging regional differences in hunting conditions, the Service has administratively divided the nation into four Flyways for the primary purpose of managing migratory game birds. Each Flyway (Atlantic, Mississippi, Central, and Pacific) has a Flyway Council, a formal organization generally composed of one member from each State and Province in that Flyway. Missisquoi NWR is within the Atlantic Flyway.

The process for adopting migratory game bird hunting regulations, located in 50 CFR Part 20, is constrained by three primary factors. Legal and administrative considerations dictate how long the rule making process will last. Most importantly, however, the biological cycle of migratory game birds controls the timing of data-gathering activities and thus the dates on which these results are available for consideration and deliberation. The process of adopting migratory game bird hunting regulations includes two separate regulations-development schedules, based on "early" and "late" hunting season regulations. Early hunting seasons pertain to all migratory game bird species in Alaska, Hawaii, Puerto Rico, and the Virgin Islands; migratory game birds other than waterfowl (e.g. dove, woodcock, etc.); and special early waterfowl seasons, such as teal or resident Canada geese. Early hunting seasons generally begin prior to October 1. Late hunting seasons generally start on or after October 1 and include most waterfowl seasons not already established. There are basically no differences in the processes for establishing either early or late hunting seasons. For each cycle, Service biologists and others gather, analyze, and interpret biological survey data and provide this information to all those involved in the process through a series of published status reports and presentations to Flyway Councils and other interested parties (USFWS 2006).

Because the Service is required to take abundance of migratory birds and other factors into consideration, the Service undertakes a number of surveys throughout the year in conjunction with the Canadian Wildlife Service, State and Provincial wildlife-management agencies, and others. To determine the appropriate frameworks for each species, we consider factors such as population size and trend, geographical distribution, annual breeding effort, the condition of breeding and wintering habitat, the number of hunters, and the anticipated harvest. After frameworks are established for season lengths, bag limits, and areas for migratory game bird hunting, migratory game bird management becomes a cooperative effort of State and Federal governments. After Service establishment of final frameworks for hunting seasons, the states may select season dates, bag limits, and other regulatory options for the hunting seasons. States may always be more conservative in their selections than the Federal frameworks but never more liberal. Season dates and bag limits for national wildlife refuges open to hunting are never longer or larger than the State regulations. In fact, based upon the findings of an EA developed when a national wildlife refuge opens a new hunting activity, season dates and bag limits may be more

restrictive than the State allows.

NEPA considerations by the Service for hunted migratory game bird species are addressed by the programmatic document, "Final Supplemental Environmental Impact Statement: Issuance of Annual Regulations Permitting the Sport Hunting of Migratory Birds (FSES 88-14)," filed with the EPA on June 9, 1988. The Service published Notice of Availability in the Federal Register on June 16, 1988 (53 FR 22582), and our Record of Decision on August 18, 1988 (53 FR 31341).

Anticipated direct, indirect, and cumulative impacts to the migratory populations of the Eagle Point Unit are further described below.

Ducks, Coots, and Mergansers: In Vermont, the duck, coot, and merganser hunting season typically begins in early to mid-October and ends sometime in mid-December. The season may or may not be split, depending on the zone. The State has three waterfowl hunting zones, with the Eagle Point Unit being in the Interior Vermont Zone. Some of the best waterfowl hunting prospects in Vermont occur on and along Lake Memphremagog and its tributary rivers. The Eagle Point Unit offers waterfowl hunting opportunities within wetland areas of the property, along the entire portion of Hall's Creek, a small portion of the John's River, and a portion of the shoreline of Lake Memphremagog.

Throughout the State, hunting impacts to waterfowl can be limited due to weather conditions. By mid- to late-November, water becomes frozen, thereby reducing hunting opportunities, especially in smaller wetland areas of the State. Snow can also limit access and hunter participation in the waterfowl season. On average, the annual duck harvest (including mergansers) per hunter in Vermont was 10.7 and 8.5, in 2009 and 2010, respectively. The coot harvest during both years was considered insignificant (reported as <50) and was probably incidental, while hunters were looking for or hunting other species. Mallards, wood ducks, and green-winged teal were the most commonly harvested duck species, followed by common goldeneyes, black ducks, and ring-necked ducks. During 2010, Vermont's 2,700 active duck hunters constituted only 1.4 percent of the duck hunters within the Atlantic Flyway, and accounted for 1.2 percent of the flyways' harvest (Raftovich 2011).

The migratory waterfowl using the Eagle Point Unit in the Lake Memphremagog Basin are a negligible amount of birds managed by the Service on a flyway basis. The Eagle Point Unit contains approximately 150 acres of wetland habitat, some of which is flooded bottomland forest and intermediate fen which are not typically used for hunting waterfowl. Due to the small size of the tract and the limited places for duck hunting to occur there, waterfowl hunting on the Eagle Point Unit would not have cumulative negative impacts on the State, regional, or Atlantic Flyway population of ducks, coots, or mergansers.

Canada Goose, Snow Goose, and Brant: Resident Canada goose populations have increased exponentially over the last few decades creating a dramatic rise in crop damage and nuisance

goose complaints throughout the Atlantic Flyway. Harvest regulations set by the Service and adopted by the State are increasingly aimed at harvesting resident goose populations to address this issue. Harvest of Canada geese on Eagle Point is expected to be low and likely opportunistic. While some resident geese use the Memphremagog area numbers are low and the expected impact to State or flyway populations will be insignificant.

Greater snow geese are the most abundant light goose population in the Atlantic Flyway. Estimates from 2012 population surveys were twice the size of the population objective of 500,000 birds. In recent years, snow geese which migrate along the Champlain Valley have increasingly moved towards New York State during fall migration, likely due to the increased crop production in that State (Crenshaw 2012). As a result, opportunities for harvesting snow geese on the Eagle Point Unit are opportunistic at best and represent an insignificant portion of the State's migratory population.

Atlantic brant populations are measured during January surveys on their Atlantic Flyway coastal wintering grounds. In the 2012 Mid-Winter Waterfowl Survey, 149,200 brant were counted, which was similar to the 2011 estimate (USFWS 2012). Brant hunting most likely would be opportunistic, when hunters are on Lake Memphremagog (not part of the Eagle Point Unit), hunting for other waterfowl species.

Vermont's 2,100 active goose hunters constituted only 1.1 percent of the goose hunters within the Atlantic Flyway. Goose hunters in Vermont spent approximately 14,000 and 9,300 days in the field in 2009 and 2010 respectively, which constitutes merely 1.4 percent and 0.9 percent of the time spent by goose hunters in the Atlantic Flyway (Raftovich 2011).

Overall, the migratory waterfowl in the Lake Memphremagog Basin are a very small part of a large population of birds that are managed by the Service on a flyway basis. The Eagle Point Unit has limited goose hunting opportunities within the grassland fields of the tract. Given the small percentage of State goose hunters relative to the flyway and due to the small size of the tract, the limited places for goose hunting, and the erratic occurrences of brant and snow geese on the Unit, no adverse cumulative impacts on State, regional, or Atlantic Flyway populations are expected.

American Woodcock: There is no information regarding harvest of woodcock on this property, though given the habitat conditions and small land acreage, we expect that only limited woodcock harvest occurred historically. In addition, we anticipate limited woodcock hunting opportunities on this Unit in the future. From a flyway perspective, woodcock harvest on Eagle Point would contribute a negligible amount of the total harvest within the eastern management unit. For the local breeding woodcock population it is expected that migratory birds comprise the bulk of Vermont's population during established hunting seasons and therefore dilute the impact on resident breeding birds.

In Vermont, woodcock populations appear to be stable with slightly increasing over a 10-year

period (0.36 percent/year from 2002 to 2012) although slightly decreasing over the long term (1966 to 2012) (Cooper and Rau 2012). Although woodcock are showing declines in numbers on their breeding grounds, habitat loss is considered the most important factor. However, researchers reviewing historical harvest data in relation to known losses of available habitat questioned if hunting had possibly become an additive rather than compensatory source of mortality. This assertion was tested in a study conducted by the U.S. Geological Survey (USGS), Patuxent Wildlife Research Center in 2005. Results showed no significant differences in woodcock survival between hunted and non-hunted areas. Furthermore, the authors concluded that hunting was not having a significant impact on woodcock numbers in the Northeast (McAuley et al. 2005).

According to information from the Silvio O. Conte National Fish and Wildlife Refuge, Nulhegan Basin Division, in the northeastern part of Vermont, woodcock harvest is low (Maghini 2012, personal communication). Based on this information, the limited amount of available habitat on the Eagle Point Unit, and the fact that hunting season for woodcock typically starts in October (when migratory woodcock are moving through Vermont), it is highly unlikely that the harvest of woodcock there will cause cumulative impacts to the local, State, or eastern unit flyway population.

Wilson's Snipe: Currently snipe population surveys show a stable trend from 1966-2011 and a slightly increasing population in Vermont (3.5 percent) (Sauer et al. 2012). Snipe harvested in Vermont are likely incidental take by sportsmen engaged in hunting other species. According to harvest information an average of 200 snipe per year are taken in Vermont (long term average from 1999-2010) with between 50 to 100 individuals reporting for the State and an average seasonal bag of 4.1 snipe per hunter (Raftovich et al 2012). Using the long term average of snipe harvest in the State, which represents only 0.49 percent of the flyway harvest for this species, snipe hunting on the Eagle Point Unit would have negligible impacts. The Service concludes that any incidental harvest of this species on the refuge would not be significant on a local, State, and flyway populations; therefore, no cumulative impacts are anticipated.

In summary by following Federal and State regulations, the harvest of migratory bird species on the Eagle Point Unit is highly unlikely to create any cumulative significant impact to local, regional, or flyway populations.

4. Other Wildlife

Hunter disturbance to nongame resident wildlife may be a negative cumulative impact; however, such an impact is unlikely because of the timing of most of the hunting seasons in Vermont. The majority of hunting occurs during fall and winter, a time of the year when small mammals, reptiles, amphibians, and invertebrates are inactive. The likelihood of hunter interaction with most species should be rare; isolated encounters with small mammals, reptiles, amphibians, and invertebrates should not have cumulative negative effects on populations.

Small mammals, including bats, are generally inactive during late fall and winter when most hunting seasons occurs. Hibernation or torpor by cold-blood reptiles and amphibians, when temperatures are low, limits their activity during the hunting season. Invertebrates are also not active during cold weather. Hunters should rarely encounter these species and no negative cumulative impacts to their populations should occur from this activity.

Disturbance by hunting to nongame migratory or resident bird species should not have cumulative negative impacts since most hunting seasons do not coincide with the bird's nesting or reproductive season. Disturbance to the daily wintering activities, such as feeding and resting, may occur, though this disturbance is probably equal to that caused by birdwatchers or other non-consumptive wildlife enthusiasts.

Species that require a more open understory, which results from deer over browsing, could be adversely affected if a reduction in the deer herd produces changes in the understory vegetation. However, as the vegetation returns to its more natural state, the associated fauna should also reflect the more natural diversity. The overall species diversity of the Unit is not expected to be diminished by this hunting alternative. In fact, if deer densities are maintained at appropriate levels through a hunting program, forest structure should improve which will provide better habitat for a variety of understory migratory birds, mammals and other wildlife.

Under this alternative there could be negligible impacts to other wildlife species due to the temporary disturbance of hunting on the Unit. The Service concludes, however, that it is highly unlikely that the continuation of hunting on the Eagle Point Unit will have any cumulative significant impacts to local or regional populations of non-hunted wildlife.

5. Endangered and Threatened Species

This project was reviewed by the Service's New England Field Office. There are no known federally listed threatened or endangered species which occupy the Eagle Point Unit (Orleans County); therefore, hunting this unit would have no effect on federally listed species or critical habitat.

2. Alternative 2: Continue to hunt the Eagle Point Unit of the Missisquoi NWR, following State of Vermont seasons and regulations, with the exceptions of: (1) no spring turkey hunting, and (2) rifle deer hunting from a tree stand only.

A. Vegetation

The impacts of this alternative on habitat and plants are generally the same as those for Alternative 1. With no spring turkey season there may be a reduced likely hood of trampling new growth of plants. However the low use expected would not have a material effect on the plant communities on the property.

B. Wildlife

The impacts of this alternative on the wildlife populations of the refuge are discussed below.

1. Small Game

The impacts to small game under this alternative would be the same as in Alternative 1.

2. Big Game

The impacts to black bear and moose would be the same as in Alternative 1.

White-tailed Deer: In Vermont, the majority of deer harvested are taken during the rifle hunting season. Requiring hunters to use elevated tree stands during the rifle season could reduce the number of hunters and the number of deer harvested. On the Eagle Point Unit, this scenario is unlikely since the area available for deer hunting is relatively small and already limits the number of deer hunters. This requirement will make it more difficult during youth hunts where two stands would be required which is likely to reduce the number of hunters participating for that hunt. Overall, Service expects that requiring rifle hunting from tree stands would not materially affect the total number of deer harvested from this Unit. Existing state requirements are effective in managing public safety in all the State's WMAs (Vermont statute Title10 VSA 4710).

Wild Turkey: By eliminating the spring turkey season, fewer turkeys would be removed from the Eagle Point Unit, which may result in increased local reproduction. Even though the majority of turkeys are taken during the spring season, the limited habitat and relatively small size of the Eagle Point Unit would negate any positive effects on local, regional, or statewide turkey populations. By eliminating spring turkey hunting there would be no cumulative negative effects on local and statewide turkey populations and only negligible positive effects based upon the relatively small area affected.

3. Migratory Game Birds

Disturbance to migratory bird species in the spring may be reduced due to the elimination of the spring turkey hunting season. Potential disturbance impacts to the local breeding population of woodcock may be lessened, though this may not cause an increase in overall woodcock population (McAuley et al. 2005). In addition, less walking disturbance during the deer rifle hunting season may give waterfowl or other birds more opportunities to rest and feed. There would be no negative cumulative impact for migratory birds on a local, State, or flyway level under this alternative.

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4. Other Wildlife

Under this alternative, impacts to other wildlife would be limited mainly to the fall and winter seasons, a time of the year when small mammals, reptiles, amphibians, and invertebrates are inactive. Hunter interaction with most species during this time should consist of isolated encounters that would not have cumulative negative effects on populations. As a result, it is likely that there would be no cumulative negative impacts to local, regional, or State populations of wildlife species under this alternative.

5. Endangered and Threatened Species

The project was reviewed by the Service's New England Field Office. There are no known federally listed threatened or endangered species which occupy the Eagle Point Unit (Orleans County). Therefore, hunting this unit would have no effect on federally listed species or critical habitat.

B. Anticipated Direct and Indirect Impacts of Proposed Action on Eagle Point Unit Programs, Facilities, and Cultural Resources

1. Other Refuge Wildlife-Dependent Recreation

A. Alternative 1 (Proposed Action): Continue to hunt the Eagle Point Unit of the Missisquoi NWR, following State of Vermont seasons and regulations.

Under the proposed action, the estimated number of hunters and the number of days the Eagle Point Unit is open to hunting, would remain the same, since State of Vermont seasons and regulations would continue to be followed. Hunting has been permitted on the property, as authorized by a pre-acquisition compatibility determination (CD) for the Eagle Point Unit. Prior to that, Michael Dunn, the former landowner, encouraged and allowed public hunting on the property as well. No significant conflicts between user groups have occurred as a result of hunting on the property. Therefore, since the status quo would be maintained, this alternative should have little effect on current wildlife-dependent recreational opportunities and uses in the area.

Many forms of wildlife-dependent recreation, such as wildlife observation, photography, interpretation, environmental education, and fishing, occur during the spring and summer (March to August) when most hunting is closed. Only spring crow hunting (March to April), muskrat hunting (March to April), coyote hunting (open year-round), youth turkey weekend (last weekend in April), spring turkey hunting (May), and dog training by SUP, would occur during this time. Of these, only spring turkey hunting is anticipated to occur with any regularity on the Eagle Point Unit.

The potential exists for conflicts between spring turkey hunters and other Eagle Point Unit visitors during the month-long (May 1 to 31) spring turkey season. Possible conflicts, however, are minimized by the half-day legal hunting hours, the anticipated short-term hunter effort, and the expected low hunter density on the unit. In Vermont, legal hunting hours for the spring turkey season end at noon each day. This allows other visitors to use the area for the remainder of the day without encountering hunters. In addition, hunter effort is greatest on the opening day of spring turkey season and gradually wanes as the season progresses. After about 2 weeks, turkey hunting activity decreases considerably since the most accessible birds have been harvested, other birds become wary and harder to call, and turkey gobbling becomes infrequent.

In addition, the topography and juxtaposition of land cover types on the Eagle Point Unit effectively limit the distribution of competing gobblers, as well as the number of hunters, that can hunt there concurrently. Realistically, the unit probably would host one or two hunting parties per day, on three weekends, hunting from half-an-hour before sunrise until noon. Hunting pressure is greatest on weekends and is substantially lower on weekdays. Key weekends would include youth hunting weekend (last weekend in April), and the first two weekends of the spring turkey season. Spring turkey hunting effort on weekdays and after these weekends is expected to be extremely light to non-existent. Consistent with signage currently posted on Missisquoi NWR, signs could be placed at access points along the grassland-forest loop trail to alert non-hunting visitors of spring turkey hunting season dates and hours (Hamelin 2012, personal communication).

The fall (September to November) presents the greatest possibility for conflict between hunters and other user groups, since most of Vermont's hunting seasons occur during this time. It is anticipated that the majority of hunters using the Eagle Point Unit will pursue deer, ruffed grouse, waterfowl, and/or (fall) turkey, all of which have hunting seasons during this timeframe. Hunting is a long-standing tradition in Vermont and hunting seasons are well-established, anticipated annual events. Most of the non-hunting public in Vermont recognizes fall hunting, especially for species like deer (since 92 percent of Vermont hunters hunt deer), and adjust their activities accordingly during this time. Signs have been placed at access points along the Eagle Point Unit in order to alert non-hunting visitors of fall hunting seasons, though history has shown there to be little conflict between hunters and non-hunters on WMAs in Vermont (Hamelin 2012, personal communication). In summary, by following the State of Vermont seasons and regulations, the hunt program on the Eagle Point Unit is not likely to have significant negative impacts to other visitors or the non-hunting public.

B. Alternative 2: Continue to hunt the Eagle Point Unit of the Missisquoi NWR, following State of Vermont seasons and regulations, with the exceptions of: (1) no spring turkey hunting, and (2) rifle deer hunting from a tree stand only.

Under this alternative, the estimated number of hunters and the number of days the Eagle Point Unit is open to hunting, could be less than Alternative 1, since there would be no spring turkey

hunting. In addition, there may be fewer deer hunters since deer hunting with a rifle would require the use of a tree stand. All other Vermont hunting seasons and regulations would continue to be followed. Hunting was permitted by the former landowner, and has been authorized by a pre-acquisition CD for the Eagle Point Unit. No conflicts have been noted between the hunting and non-hunting public. Therefore, this alternative should have little effect on current wildlife-dependent recreational opportunities and uses in the area.

Many forms of wildlife-dependent recreation, such as wildlife observation, photography, interpretation, environmental education, and fishing, occur during the spring and summer (March to August) when most hunting is closed. Under this alternative, only spring crow hunting (March to April), muskrat hunting (March to April), coyote hunting (open year-round), and dog training by SUP, would occur during this timeframe. Due to the small size of the Eagle Point Unit and its limited habitats, hunting for these species most likely will be incidental and infrequent.

The fall (September to November) presents the greatest possibility for conflict between hunters and other user groups, since most of Vermont's hunting seasons occur during this time. It is anticipated that the majority of hunters using the Eagle Point Unit will pursue deer, ruffed grouse, waterfowl, and/or (fall) turkey, all of which have hunting seasons during this timeframe.

Hunting is a long-standing tradition in Vermont and hunting seasons are well-established, anticipated annual events. Most of the non-hunting public in Vermont recognizes fall hunting, especially for species like deer (since 92 percent of Vermont hunters hunt deer), and adjust their activities accordingly during this time. Signs could be placed at access points along the Eagle Point Unit in order to alert non-hunting visitors of fall hunting seasons, though history has shown there to be little conflict between hunters and non-hunters on WMAs in Vermont (Hamelin 2012, personal communication). In summary, this alternative is not likely to have significant negative impacts to other visitors or the non-hunting public.

2. Unit Facilities

A. Alternative 1 (Proposed Action): Continue to hunt the Eagle Point Unit of the Missisquoi NWR, following State of Vermont seasons and regulations.

The continuation of hunting, according to Vermont seasons and regulations, will not have cumulative negative impacts to the facilities, infrastructure, or wildlife on the Eagle Point Unit. The small size of the unit and limited habitats will most likely limit the type (deer, ruffed grouse, waterfowl, and turkey) and number of hunters using the property. Periodic maintenance and improvement to existing trails, parking areas, and roads will be necessary regardless if there is hunting on the unit or not. All wildlife-dependent users, including both the hunting and non-hunting public, will benefit from these activities. Although repairs to trails and roads can cause small-scale, site-specific damage to vegetation and soils, they will occur during the least sensitive and least disruptive time for wildlife. Any vegetation or soil disturbances will be restored to a natural condition, as quickly as possible. Hunting according to the State seasons and regulations

is not likely to have significant negative impacts to parking areas, roads, trails, or other infrastructure at the Eagle Point Unit.

B. Alternative 2: Continue to hunt the Eagle Point Unit of the Missisquoi NWR, following State of Vermont seasons and regulations, with the exceptions of: (1) no spring turkey hunting, and (2) rifle deer hunting from a tree stand only.

Alternative 2 will be similar to Alternative 1, though no spring turkey hunting, and rifle deer hunting from a tree stand only, may lessen the impact of hunters to unit facilities even further. Maintenance on the roads and trails on the Eagle Point Unit is done for all wildlife-dependent users. Maintenance of these facilities may cause some wildlife disturbances and small-scale, site-specific vegetation and soil damage. These activities would be timed to cause the least amount of disturbance to wildlife. All disturbed vegetation sites would be restored to as natural a condition as possible.

3. Cultural Resources

A. Alternative 1 (Proposed Action): Continue to hunt the Eagle Point Unit of the Missisquoi NWR, following State of Vermont seasons and regulations.

The body of Federal historic preservation laws has grown dramatically since the enactment of the Antiquities Act of 1906. Several themes recur in these laws, their promulgating regulations, and more recent Executive Orders. They include: (1) each agency is to systematically inventory the historic properties on their holdings and to scientifically assess each property's eligibility for the National Register of Historic Places (NRHP); (2) Federal agencies are to consider the impacts to cultural resources during the agencies' management activities and seek to avoid or mitigate adverse impacts; (3) the protection of cultural resources from looting and vandalism are to be accomplished through a mix of informed management, law enforcement efforts, and public education; and (4) the increasing role of consultation with groups, such as Native American tribes, in addressing how a project or management activity may impact specific archaeological sites and landscapes deemed important to those groups. The Service, like other Federal agencies, is legally mandated to inventory, assess, and protect cultural resources located on those lands that the agency owns, manages, or controls. The Service's cultural resource policy is delineated in 614 FW 1-5 and 126 FW 1-3.

Land acquisition by the Service provides some degree of protection to significant cultural and historic resources. Although no cultural resource inventory or study has been conducted on the property it is likely that potential archaeological sites do exist based on the location of the property along the lake shore. Should resources be identified they would receive protection from damage by Federal activity and protection from vandalism or theft. The National Historic Preservation Act (NHPA) requires that any actions by a Federal agency which may affect archaeological or historical resources be reviewed by the SHPO, and that the identified effects

must be avoided or mitigated. The Service's policy is to preserve these cultural, historic, and archaeological resources in the public trust, and avoid any adverse effects wherever possible.

Development of existing roads, trails, and structures have previously required review by the Service's Regional archaeologist and notification to the SHPO, as mandated by Section 106 of the NHPA. The Service's policy is to preserve these cultural, historic, and archaeological resources in the public trust, and avoid any adverse effects wherever possible. The continuation of hunting on the Eagle Point Unit will not require additional infrastructure and is not expected to have negative cumulative impacts to cultural resources.

B. Alternative 2: Continue to hunt the Eagle Point Unit of the Missisquoi NWR, following State of Vermont seasons and regulations, with the exceptions of: (1) no spring turkey hunting, and (2) rifle deer hunting from a tree stand only.

Alternative 2 would be similar to Alternative 1, and would pose no negative cumulative effects to the cultural and historic resources at the Eagle Point Unit. The Service, like other Federal agencies, is legally mandated to inventory, assess, and protect cultural resources located on those lands that the agency owns, manages, or controls. The Service's cultural resource policy is delineated in 614 FW 1-5 and 126 FW 1-3. Service acquisition of land with known potential archaeological or historical sites provides two major types of protection for these resources: protection from damage by Federal activity and protection from vandalism or theft.

The NHPA requires that any actions by a Federal agency which may affect archaeological or historical resources be reviewed by the SHPO, and that the identified effects must be avoided or mitigated. The Service's policy is to preserve these cultural, historic, and archaeological resources in the public trust, and avoid any adverse effects wherever possible. Development of existing roads, trails, and structures have previously required review by the Service's Regional archeologist and notification to the SHPO, as mandated by Section 106 of the NHPA. The Service's policy is to preserve these cultural, historic, and archaeological resources in the public trust, and avoid any adverse effects wherever possible. Alternative 2, like Alternative 1, is not expected to have negative cumulative impacts to cultural resources.

C. Anticipated Impacts of Proposed Hunt on Eagle Point Unit Environment and Community

1. Alternative 1 (Proposed Action): Continue to hunt the Eagle Point Unit of the Missisquoi NWR, following State of Vermont seasons and regulations.

This alternative will not have any sizeable impacts on the soils, vegetation, air quality, water quality, or solitude on the Eagle Point Unit, or adjacent lands, or nearby residents. Most hunting on the Eagle Point Unit is expected to occur during 4 months (September, October, November, and May) of the year, with the targeted species being deer, upland game birds, waterfowl, and

wild turkey. The small size of the unit and available habitats most likely will limit the number of hunters who travel to and use the Eagle Point Unit. Some local conflicts may occur with increased number of hunters utilizing the property which had previously been privately owned. We expect these occurrences to decrease over time as hunters learn the boundaries of the new property, and signage for parking and access are completed. As with any new public land, there will likely be an initial increase of hunters and other uses that wish to explore this property.

Some disturbances to the soil and vegetation are expected on the unit as a result of hunting, but the impacts should be nominal. Most hunting (deer, ruffed grouse, (fall) turkey) will occur during the fall, when vegetation is dormant and the ground is frozen or covered with snow. During the month of May, when conditions are wet, spring turkey hunters could trample vegetation, but the effects should be minimal and temporary. The topography and juxtaposition of land cover types effectively limits the distribution of competing gobblers, as well as the number of turkey hunters who can effectively hunt there (Hamelin 2012, personal communication).

The effect of hunting activities on the regions' air and water quality should be small or negligible, especially when compared to the contributions of nearby industrial, business, and residential centers, as well as the emissions and impacts from local vehicle traffic and summer vacationers. Run-off into wetlands or other water bodies on the Eagle Point Unit is expected to be minor, with no negative impacts to water quality standards.

No negative impacts on solitude are expected from hunting on the Eagle Point Unit. Hunters, by nature, usually move through an area quietly, in order to avoid being spotted by their prey. They may even assume their hunting positions in pre-dawn hours. Waterfowl, deer and turkey hunting is often conducted from a camouflaged, sedentary position in order to not disturb birds or other wildlife. The unit's small size will limit the number of hunters at any given time.

In 2010, 86 percent of Vermont's hunting licenses were purchased by Vermonters (VTFW, 2013). It is anticipated that most hunters using the Eagle Point Unit would be from the State of Vermont. In fact, most may even be from the local area, since the size of the unit is small, and better hunting opportunities probably could be found on other state WMAs, or even other areas within WMU D1.

It is estimated that hunters spend more than $189 million dollars annually in Vermont with purchases of gas, food, lodging, hunting licenses, equipment, and supplies (USFWS, 2006). It is expected that hunting on the Eagle Point Unit will provide some revenue to Derby, as well as the surrounding towns in the area. Hunting is not anticipated to have a negative impact on the contributions already made to the local economy by other wildlife-dependent recreationists.

Hunting on the Eagle Point Unit may have other advantages as well. By keeping local deer populations in balance with the carrying capacity of the habitat, vegetation both on and off the unit may benefit. Deer hunting could also contribute to the reduction of vehicle damage and

human injury from collision between deer and vehicles. In 2010 nearly 3,183 vehicle collisions with deer were reported in Vermont costing an estimated 10.7 million dollars in damage.

In summary, the hunt program on the refuge is not likely to have significant negative impacts to refuge environment, adjacent lands, or nearby residents, which includes soils, vegetation, air quality, water quality, and solitude. There is also not likely to be a negative impact on the community as there most likely will be a positive economic benefit from the hunt program.

2. Alternative 2: Continue to hunt the Eagle Point Unit of the Missisquoi NWR, following State of Vermont seasons and regulations, with the exceptions of: (1) no spring turkey hunting, and (2) rifle deer hunting from a tree stand only.

Under this alternative, the impacts to the refuge environment (soil, vegetation, air quality, water quality, and solitude), adjacent lands, or nearby residents are expected to be similar or the same as Alternative 1. The decrease in potential hunters (spring turkey, possibly deer hunters with rifles) may decrease the amount of gas, food, lodging, hunting licenses, equipment, or supplies, purchased from the local economy, though probably not by much. Some deer hunters may actually be drawn to the area to take advantage of high quality hunts, which could balance out any losses. In addition, deer hunting may benefit the local vegetation, help reduce conflicts with private landowners, and lessen vehicle damage and human injury from collisions.

D. Other Past, Present, Proposed, and Reasonably Foreseeable Hunts and Anticipated Impacts

The Eagle Point Unit was hunted prior to refuge ownership. All State seasons and regulations were observed and are being proposed under Alternative 1 of this assessment. Given that past hunting opportunities are generally identical to what Alternative 1 is proposing, there will be no foreseeable impacts other than what has been described in previous sections of this document. SUPs can be issued for dog training outside of the regular State hunting seasons, but this activity will likely be on such a limited basis that it should not significantly impact wildlife, habitat, public use, cultural resources or any other aspect of the surrounding environment on the Eagle Point Unit.

For Alternative 2 there are no additional impacts, as spring turkey season would be eliminated.

E. Anticipated Impacts if Individual Hunts are Allowed to Accumulate

Service staff recognizes that all uses of Service lands create some impact to its wildlife and habitats. These uses, when taken together, have the potential to create accumulating impacts as the number of uses increases. Because of the potential to create accumulating impacts, refuge uses are limited to those which have been formally determined to be compatible with the purposes for which the refuge was established, and with the mission of the Refuge System.

When these formal CDs are reviewed (every 10 to 15 years depending on the use) possible accumulating impacts that may have occurred in succeeding years will be considered and will be addressed as necessary.

Hunting for deer, small game, turkey, and waterfowl is a historical use of the Eagle Point Unit. So far, the cumulative impact analysis has looked at each type of hunting and has discussed the possible impacts associated with each of them.

In this section, the potential impacts of all hunts together, will be addressed. When considering the overlap of hunting seasons in space and time, the patterns of hunter use (by time of year and habitat), and the impacts on other wildlife-dependent recreation, the accumulated impacts of the proposed action must be evaluated.

To evaluate hunter use by time of year and habitat type, the best data available are hunting season dates. The following table shows the State of Vermont 2012-2013 hunting seasons, along with the dates when these seasons are open (Table 1). Most species in Vermont have seasons that are restricted to a few weeks or a few months, generally during the fall or spring. Since coyote hunting is open year-round in Vermont, the Eagle Point Unit would be open to hunting them year-round. Hunting species, such as waterfowl or muskrats, would require that hunters utilize certain habitats (i.e. wetlands or rivers) at certain times of the year. This necessarily limits impacts to specific habitats during different times of the year.

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Table 1. Open hunting seasons at Eagle Point Unit of Missisquoi NWR

Vermont Game Seasons 2013-2014			
Season	**Season Open**	**Season Closed**	**Length of Season (days)**
Bear-early	1-Sep	15-Nov	76
Bear-late	16-Nov	24-Nov	9
Bobcat	10-Jan	7-Feb	29
Brant	12-Oct	30-Nov	48
Canada Geese (early)	6-Sep	25-Sep	19
Canada Geese (late)	20-Oct	3-Dec	43
Cottontail Rabbit/Snowshoe Hare	28-Sep	9-Mar	163
Coyote	1-Jan	31-Dec	365
Crow (Early)	14-Mar	30-Apr	48
Crow (Late)	16-Aug	29-Oct	75
Deer (Archery)	7-Dec	15-Dec	9
Deer (Archery)	5-Oct	27-Oct	23
Deer (Muzzleloader)	7-Dec	15-Dec	9
Deer Regular Season	16-Nov	1-Dec	16
Deer(Youth)	9-Nov	10-Nov	2
Dog Training - Bear	1-Jun	15-Sep	107
Dog Training - Bobcat/Fox	1-Jun	15-Mar	288
Dog Training - Cottontail Rabbit/Snowshoe Hare/Game Bird	1-Jun	28-Sep	120
Dog Training - Raccoon	1-Jun	28-Sep	120
Ducks, Coots, Mergansers	12-Oct	10-Dec	58
Moose (Archery)	1-Oct	7-Oct	7
Moose (Regular Season)	19-Oct	24-Oct	6
Muskrat	20-Mar	19-Apr	31
Raccoon	12-Oct	31-Dec	81
Red and Grey Fox	26-Oct	9-Feb	107
Ruffed Grouse	28-Sep	31-Dec	95
Snow Geese-Fall	1-Oct	29-Dec	88
Snow Geese-Spring	11-Mar	26-Apr	47
Squirrel	1-Sep	31-Dec	122
Turkey (Fall)	5-Oct	3-Nov	30
Turkey (Spring)	1-May	31-May	31

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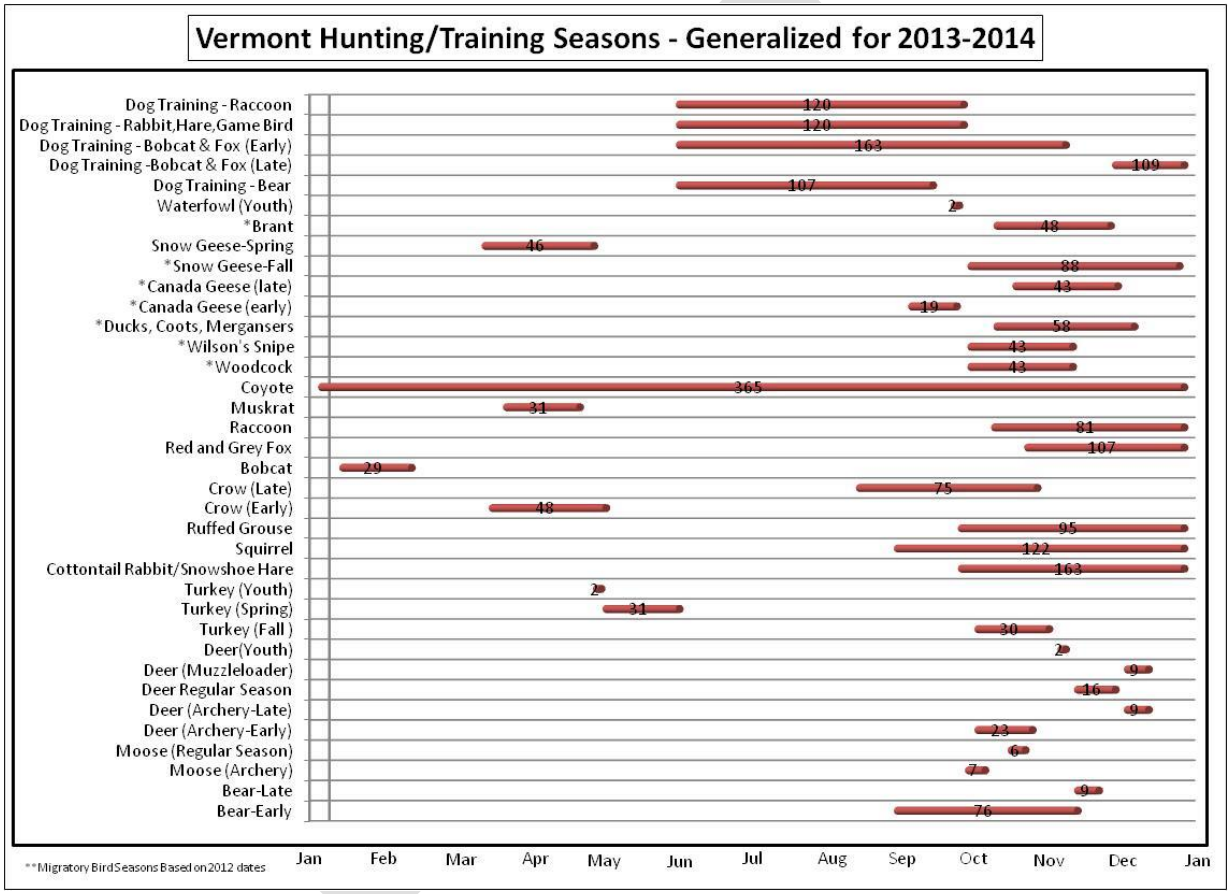
Turkey (Youth)	27-Apr	28-Apr	2
Waterfowl (Youth)	24-Sep	25-Sep	2
Wilson's Snipe	1-Oct	14-Nov	45
Woodcock	1-Oct	14-Nov	45
***migratory bird seasons based on 2012 dates**			

Figure 3. Hunting seasons for species hunted on Eagle Point Unit of Missisquoi NWR



Many hunting seasons overlap and hunters often take advantage of this to hunt concurrently for several species. For example, a hunter may report hunting for deer, bear, squirrel, and turkey during the fall. Additionally, many species are incidentally harvested during the more popular hunting seasons. This is even more pronounced on a property such as the Eagle Point Unit, with limited acreage. Therefore, the overlapping seasons do not necessarily imply increased numbers of hunters or increased harvest of all game species on the Eagle Point Unit.

Migratory birds, upland small game, and upland big game are hunted within the Eagle Point Unit. Eagle Point is composed of two broad habitat classes (upland and wetland) and wildlife species are typically associated with one or the other of these habitat types. The topography of the Unit (lake shore bounding the western and southern extents and the international border to the north) conveys certain usage patterns by hunters. Hunters accessing the wetlands for migratory bird hunting must cross and potentially disturb upland habitats. However many hunters in the Hall's Creek wetland would presumably utilize a boat and access the property from Eagle Point Road. Hunters focusing on upland small and big game are less likely to cross wetlands, limiting disturbance to this habitat type.

Most hunting occurs during the fall, winter, and spring. Dog training occurs during the summer months. Coyote hunting is permitted year-round. Each season of the year offers a different set of circumstances which may be affected by the presence of hunters. The impacts of overlapping seasons and hunter movements through habitats are considered below.

Fall and Winter Seasons

Both upland and wetland habitats are hunted during the fall. Migratory birds hunted on the Unit are found in the wetlands and surrounding poorly drained shrublands. Hunters typically cross upland habitats to reach suitable areas for hunting species such as woodcock, geese, snipe, and other waterfowl. The open seasons for these migratory bird species begin in early October and end in late December. The woodcock season can be over 40 days, early October to mid-November. Woodcock and waterfowl may be hunted with dogs.

Hunting for upland small game occurs between early September and late April. On Eagle Point, it is likely that ruffed grouse are the most popular species based on habitat conditions. The recent successful pheasant reproduction and use of Eagle Point may also begin to attract upland small game hunters. Dogs can be used to hunt grouse, raccoon, rabbit, and hare.

The upland big game seasons (deer, bear, turkey, and moose) extend from early September to late December. The deer season is likely the most intensely hunted season on the refuge. During the bear seasons, a total of 85 days (2013-2014 season), pursuit dogs may be used.

The fall and winter hunting seasons do not occur during the breeding season for most wildlife species. Deer and bear are an exception. Deer are in rut in October and November. Hunting

activities occur when deer are courting and mating. Winter is a difficult time of year for deer to find food and move through deep snow cover. Excessive disturbance to deer during times of deep snow cover can lead to depletion of a deer's stored resources. Although bear may have already bred by the bear hunting season, females are typically pregnant. Excessive harvest of pregnant females could have negative impacts to the local population. Additionally, excessive stress on pregnant females may cause reabsorption of the fetus. Current Vermont hunting seasons, however, have not impacted bear populations, which are showing an increasing trend under State guidelines.

Fall is the season for bird migration. Hunting activities may disturb the resting and foraging of migratory birds during this critical time, but overall impacts are related to the frequency, type, and duration of the disturbance. For example, a woodcock hunter with a dog is more likely to flush woodcock (and other migratory bird species), than a woodcock hunter without a dog. If one area is hunted more than another, woodcock (and other wildlife) using that cover will be disrupted more frequently. Similarly dogs used for hunting waterfowl may have a slight disturbance effect to other wildlife as hunters travel to and from hunting locations or are in the act of retrieving a bird. Also, if an area is hunted in the morning and again in the evening, the duration and effect of disturbance is increased. Migrating and wintering raptors such as ruffed legged hawks may be hunting and roosting in upland and wetland habitats. Hunting activity may cause these birds to unnecessarily take flight, expending energy resources when food resources are limited. Nesting of some species of owls and raptors begins in late winter. The effect of hunting activities on the breeding success of winter nesting birds is unknown.

Vegetation is entering dormancy during the fall, and little impact is expected from hunters during this period. Snow cover in winter often protects herbaceous and short-shrubby vegetation from damage by hunters. Trampling in organic soils such as those found in wetlands, is known to cause soil compaction which leads to erosion and inhibits plant regeneration. At current hunter density, including the use of hunting dogs, trampling has not caused irrecoverable damage to the wetland soils and vegetation. Upland big game hunting is expected to have a minimal impact on wetland plant or animal communities because few hunters cross wetlands to access upland areas.

Spring Season

Hunting during the spring season is limited to male turkey, an upland game species. The spring turkey season is typically 31 days long, occurring for the duration of May. Because turkey is an upland species, hunters are less likely to enter wetland habitats. Their disturbance to other wildlife species and vegetation is concentrated on upland habitats.

Migratory birds, especially landbirds, are in the peak of migration during the spring turkey open season. Hunters using upland habitats may temporarily disrupt the migrating birds' feeding and resting. Most herbaceous and woody vegetation is beginning to produce the year's new leaves and spring ephemeral wildflowers are in bloom. Trampling of the understory vegetation may damage individual plants and reduce their reproductive potential for the year. Damage to shrubs

and trees by hunters is expected to be minimal.

Summer Season

Hunting seasons (coyote) and activities during the summer are few, but they occur during the peak breeding season for most wildlife using the Eagle Point Unit. Vegetation is also more vulnerable during the summer since plants are growing and producing flowers and seeds. Impacts of hunting activities are expected to be low to negligible on wildlife at the Eagle Point Unit due to the expected low interest in coyote hunting.

Vermont State guidelines allow dog training as an activity on WMAs throughout the summer months. Under the proposed alternative, dog training would only be allowed through the issuance of a SUP by the refuge manager of Missisquoi NWR. In this way, direct and cumulative impacts of this activity can be controlled and managed through the number, location, and timing of permits issued. The ability of the Service to manage dog training activities through the SUP process should prevent excessive disturbance to wildlife using the Eagle Point Unit during the summer.

Threatened and Endangered Species

There are no documented federally listed threatened or endangered wildlife or plant species on the Eagle Point Unit or within Orleans County.

Other Refuge Uses

Hunting use of the Eagle Point Unit of the Missisquoi NWR is highest in the fall, winter, and spring. Other refuge uses (wildlife observation, education, interpretation, and photography) have the highest number of visitors during the spring, summer, and fall. Winter use of the Unit by non-hunters is likely low and limited to times when access is not restricted by snow cover. Hunting impacts to other refuge uses are not expected to accumulate, and are not considered significant in relation to the other priority uses permitted at the Eagle Point Unit.

Under the proposed action (Alternative 1), based on the accumulated impacts described above, no significant impacts to refuge resources are anticipated if individual hunts are allowed to accumulate. With eliminating spring turkey hunting and restricting methods of rifle hunting (Alternative 2), the refuge will eliminate much of the potential for spring disturbance and possibly reduce disturbance in the fall. No significant accumulated impacts are expected with Alternative 2.

VI. Regulatory Compliance

Visitor Services Plan

The Missisquoi NWR completed its CCP in 2007. Step-down plans such as the Visitor Services

Plan that tier off the CCP will follow. The general visitor services management of the Missisquoi NWR is outlined in the CCP and has aided in the development the Eagle Point Unit Hunting Plan and Hunt EA.

Compatibility Determinations
A CD for hunting on the Eagle Point Unit has been completed and released for public review concurrent with the EA review.

National Environmental Policy Act Documentation
This EA meets the NEPA requirements.

Endangered Species Act Section 7 Evaluation
A Section 7 Evaluation was completed for the Eagle Point Unit Hunting Management Plan and EA in 2013.

Copies of Letters requesting State and, where appropriate, tribal involvement and the results of the request
Copies of letters requesting State review of the Hunting Management Plan and EA, and the response is included as an Appendix. No federally recognized tribes are in the vicinity of the Refuge.

News Release
A copy of the news release can be found in the Appendix.

Outreach Plan
The outreach plan was completed for this EA.

Refuge Specific Regulations
The refuge-specific regulations can be found in Section III of the EA and Section VII C. in the Hunting Management Plan.

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