

ENVIRONMENTAL ASSESSMENT

Proposal to establish and conduct Waterfowl Hunting at the STEWART B. MCKINNEY NATIONAL WILDLIFE REFUGE GREAT MEADOWS UNIT STRATFORD, CONNECTICUT

As a result of a 2003 lawsuit filed by the Fund for Animals, the U.S. Fish and Wildlife Service (Service) is required to amend environmental assessments that describe hunting programs at sixteen national wildlife refuges located in the Northeast Region. The amended environmental assessments will address the cumulative impacts of hunting at all refuges which were named in the lawsuit. This document addresses the hunting programs at Stewart B. McKinney National Wildlife Refuge, Great Meadows Unit.

Hunting at Stewart B. McKinney National Wildlife Refuge was first proposed in the *Environmental Assessment, Proposal to establish and conduct Waterfowl hunting at the Stewart B. McKinney National Wildlife Refuge Stratford Connecticut, January 2004*. Following a public comment period, the waterfowl hunting program was initiated in fall 2005.

The remainder of this document details the hunting program alternatives that were developed and finalized in the 2004 EA. Cumulative impacts of the current hunting programs at the Great Meadows Unit will be addressed following a description of the Environmental Consequences of the Proposed Action proposed in 2004.

Prepared by:

Department of the Interior
U.S. Fish and Wildlife Service
Stewart B. McKinney National Wildlife Refuge
733 Old Clinton Road
Westbrook, CT 06498

FINDING OF NO SIGNIFICANT IMPACT
Stewart B. McKinney National Wildlife Refuge
WATERFOWL HUNTING OPPORTUNITIES

The U.S. Fish and Wildlife Service proposes to evaluate the environmental impacts of establishing and conducting a waterfowl hunting program at Stewart B. McKinney National Wildlife Refuge (SBMNWR or Refuge) Great Meadows Unit. While hunting is currently not permitted on Refuge lands, historical records indicate waterfowl hunting was a traditional public use at the Great Meadows Unit (GMU) prior to acquisition by the U.S. Fish and Wildlife Service (Service). Interest in continuing this historic public use has been expressed by local sport hunters who historically used the area as well as Connecticut State wildlife officials. The Refuge believes that the implementation of a waterfowl hunting program at the GMU as directed by the National Wildlife Refuge Improvement Act of 1997 would be in order. The Refuge completed an Environmental Assessment (EA) in January 2004 and revised that EA in February 2007. The revised EA was released for a 31-day public comment period ending on April 13, 2007. The revised EA evaluated the direct, indirect, and cumulative impacts of three hunt program alternatives on the environment and their potential contribution to the mission of the National Wildlife Refuge System, and the refuge's purposes and goals. Hunting activities will be permitted, but administratively limited to those areas specified in the refuge-specific regulations. All or parts of the refuge may be closed to hunting at any time if necessary for public safety, to provide wildlife sanctuary, or for other reasons.

The Service has analyzed the following alternatives to the proposal in an Environmental Assessment (copy attached):

Alternative I - NO ACTION: All areas of the GMU remain closed to hunting.

Alternative II - PROPOSED ACTION: Open designated areas of GMU, 165 acres in size as indicated in Figure 11, for the hunting of waterfowl. Under this alternative, waterfowl hunting would be permitted in designated areas only during the designated times of Tuesday, Wednesday, and Saturday throughout the State-established waterfowl hunting season. Hunting would be conducted under controlled conditions and in accordance with the State of Connecticut and Federal regulations. Hunters would be required to obtain a hunting permit from the Service. Hunter numbers could be limited with a permit system, where permits are assigned to designated blinds or areas of the marsh to ensure a quality hunting experience. Hunting regulations would be described in a Refuge Hunt Program and may also include special restrictions on hunting methods, bag limits, and/or fixed hunting season dates or lengths. All other units of the SBMNWR and areas within the GMU would remain closed to hunting.

Alternative III - Open the entire GMU to the hunting of waterfowl. Under this alternative, all areas within the GMU would be opened to waterfowl hunting, conducted under controlled conditions, and in accordance with State and Federal regulations. Hunters would be required to obtain a hunting permit from the Service. Hunter numbers

could be limited with a permit system, where permits are assigned to designated blinds or areas of the marsh to ensure a quality hunting experience. Hunting regulations would be described in a Refuge Hunt Program and may also include special restrictions on hunting methods, bag limits, and/or fixed hunting season dates or lengths. Hunters may not erect permanent structures on or remove vegetation from the Refuge. All other units of the SBMNWR would remain closed to hunting.

The preferred alternative was selected over the other alternatives because:

1. The preferred alternative would allow the refuge to offer an opportunity for the public to harvest a renewable resource, promote a wildlife-oriented recreational opportunity, increase awareness of SBMNWR and the National Wildlife Refuge System, and meet public demand.
2. The preferred alternative is compatible with Service's general policy regarding the establishment of hunting on National Wildlife Refuges.
3. The preferred alternative is compatible with the purpose for which the SBMNWR established.
4. This proposal does not initiate widespread controversy.
5. There are no conflicts with local, state, regional, or Federal plans or policies.

Implementation of the agency's decision would be expected to result in the following environmental, social, and economic effects:

1. This would allow the public to harvest a renewable resource.
2. The public would have increased opportunity for wildlife-oriented recreation.
3. Local businesses would benefit from hunters visiting from surrounding towns.
4. The Service would be perceived as a good steward of the land by continuing traditional uses of land in Connecticut.

Copies of the Environmental Assessment are available by writing:

Stewart B. McKinney National Wildlife Refuge
733 Old Clinton Road
Westbrook, CT 06498

Therefore, it is my determination that the proposal does not constitute a major Federal action significantly affecting the quality of the human environment under the meaning of section 102(2)(c) of the National Environment Policy Act of 1969 (as amended). As such, an environmental impact statement is not required. This determination is based on the following factors (40 CFR 1508.27):

1. **Both beneficial and adverse effects have been considered and this action will not have a significant effect on the human environment (EA, page 31-39,49-50)**

2. The project will not significantly effect any unique characteristics of the geographic area such as proximity to historical or cultural resources, or ecologically critical areas (EA, pages 15-16, 29).
3. There will be no cumulative significant impacts on the environment. Cumulative impacts have been analyzed with consideration of other similar activities on adjacent lands, in past action, and in foreseeable future actions (EA, pages 39-52).
4. The actions will not significantly affect any site listed in, or eligible for listing in, the National Register of Historic Places, nor will they cause loss or destruction of significant scientific, cultural, or historic resources (EA, page 49).
5. The actions are not likely to adversely affect endangered or threatened species, or their habitats (Intra-Service Section 7 Biological Evaluation Form attached to EA).
6. The actions will not lead to a violation of Federal, state, or local laws imposed for the protection of the environment (EA, pages 53-55).
7. We Have coordinated this proposal with State and local governmental authorities (EA page 53)

References: Environmental Assessment of 2007, Waterfowl Hunting Plan SBMNR, Compatibility Determination, Letters of Concurrence, Refuge-specific Regulations, Intra-Service Section 7 Evaluation



Marvin Moriarty
Regional Director
U.S. Fish and Wildlife Service
Hadley, Massachusetts

4-27-07
Date

Acting

UNITED STATES FISH AND WILDLIFE SERVICE ENVIRONMENTAL ACTION STATEMENT

Within the spirit and intent of the Council on Environmental Quality's regulations for implementing the National Environmental Policy Act (NEPA), and other statutes, orders, and policies that protect fish and wildlife resources, I have established the following administrative record and determined that the action of (describe action):

Check One:

is a categorical exclusion as provided by 51 6 DM 2, Appendix I and 516 DM 6, Appendix 1. No further NEPA documentation will therefore be made.

X is found not to have significant environmental effects as determined by the attached environmental assessment and finding of no significant impact.

is found to have significant effects and, therefore, further consideration of this action will require a notice of intent to be published in the Federal Register announcing the decision to prepare an EIS.

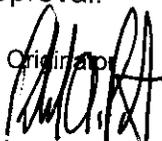
is not approved because of unacceptable environmental damage, or violation of Fish and Wildlife Service mandates, policy, regulations, or procedures.

is an emergency action within the context of 40 CFR 1506.11. Only those actions necessary to control the immediate impacts of the emergency will be taken. Other related actions remain subject to NEPA review.

Other supporting documents (list): Environmental Assessment of 2007, Waterfowl Hunting Plan SBMNWR, Compatibility Determination, letter of concurrence, Refuge-specific Regulations, Intra-Service Section 7 evaluation

Signature

Approval:

(1) Original  Date 4/24/07

(2) WO/RO Environmental Coordinator  Date 4/25/07

(3) AD/ARD  Date 4-27-07

(4) Director/Regional  Date 4/27/07

Summary

The purpose of this Assessment is to evaluate the environmental impacts of establishing and conducting a waterfowl hunting program at Stewart B. McKinney National Wildlife Refuge (SBMNWR or Refuge) Great Meadows Unit. While hunting is currently not permitted on Refuge lands, historical records indicate waterfowl hunting was a traditional public use at the Great Meadows Unit (GMU) prior to acquisition by the U.S. Fish and Wildlife Service (Service). Interest in continuing this historic public use has been expressed by local sport hunters who historically used the area as well as Connecticut State wildlife officials. The Refuge wishes to implement waterfowl hunting at the Great Meadows Unit as directed by the National Wildlife Refuge Improvement Act of 1997. All other Units of the SBMNWR will remain closed to hunting until opportunities are assessed and approved by the Refuge Comprehensive Conservation Plan (CCP).

The alternatives considered are:

Alternative I - NO ACTION: All areas of the Great Meadows Unit remain closed to hunting.

Alternative II - PROPOSED ACTION: Open designated areas of Great Meadows Unit, 165 acres in size as indicated in Figure 11, to the hunting of waterfowl. Under this alternative, waterfowl hunting would be permitted in designated areas only during the designated times of Tuesday, Wednesday, and Saturday throughout the State established waterfowl hunting season. Hunting would be conducted under controlled conditions and in accordance with State and Federal regulations. Hunters would be required to obtain a hunting permit from the Service. Hunter numbers could be limited with a permit system, where permits are assigned to designated blinds or areas of the marsh to ensure a quality hunting experience. Hunting regulations would be described in a Refuge Hunt Program and may also include special restrictions on hunting methods, bag limits, and/or fixed hunting season dates or lengths. All other units of the Stewart B. McKinney National Wildlife Refuge and areas within the Great Meadows Unit would remain closed to hunting.

Alternative III - Open the entire Great Meadows Unit to the hunting of waterfowl. Under this alternative, all areas within the Great Meadows Unit would be opened to waterfowl hunting, conducted under controlled conditions, and in accordance with State and Federal regulations. Hunters would be required to obtain a hunting permit from the Service. Hunter numbers could be limited with a permit system, where permits are assigned to designated blinds or areas of the marsh to ensure a quality hunting experience. Hunting regulations would be described in a Refuge Hunt Program and may also include special restrictions on hunting methods, bag limits, and/or fixed hunting season dates or lengths. Hunters may not erect permanent structures on nor remove vegetation from the Refuge. All other units of the Stewart B. McKinney National Wildlife Refuge would remain closed to hunting.

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I. INTRODUCTION

A. Stewart B. McKinney National Wildlife Refuge

1. Location

Stewart B. McKinney National Wildlife Refuge (SBMNWR or Refuge) consists of ten separate Units located along the Connecticut coast: Salt Meadow Unit in Westbrook; Falkner Island Unit in Guilford; Outer Island Unit in Branford; Milford Point Unit in Milford; Great Meadows Unit in Stratford; Goose Island Unit in Westport; Chimon Island, Sheffield Island, and Peach Island Units in Norwalk; and Calf Island in Greenwich (Figure 1).



Figure 1. Units of the Stewart B. McKinney National Wildlife Refuge

The *Salt Meadow Unit*, originally Connecticut's first National Wildlife Refuge, contains 311 acres of marsh and upland habitat in the Town of Westbrook. The Unit is situated approximately seven miles west of the mouth of the Connecticut River and one-half mile south of Interstate 95 between exits 64 and 65. The western boundary borders the shores of two freshwater tidal rivers, the Menunketesuck River and Gatchen Creek.

The Falkner Island Unit is a five acre maritime island located three miles off the coast of Guilford in Long Island Sound.

The Outer Island Unit is a five acre island located in the Town of Branford and the southernmost island in the Thimble Islands Chain.

The Milford Point Unit is a 22-acre barrier beach peninsula located at the mouth of the Housatonic River in the Town of Milford.

The Great Meadows Unit is a 421 acre tidal marsh complex of salt marsh located on the southwestern Connecticut shoreline in the Town of Stratford between the mouth of the Housatonic River and Bridgeport Harbor.

Chimon Island Unit is the largest island in the Norwalk Islands Chain. This 70-acre unit is located one mile offshore the City of Norwalk.

Sheffield Island Unit is a 57-acre island located one mile west of the *Chimon Island Unit*.

Peach Island Unit is only 2.6 acres located close to shore in Norwalk Harbor.

Goose Island Unit is an acre and a half and located in the Town of Westport approximately one-half mile southeast of *Chimon Island Unit*.

Calf Island Unit is a 29-acre island located in the town of Greenwich just 35 miles from New York City.

2. Brief History

The first parcel of the Stewart B. McKinney National Wildlife Refuge property (191 acres) was an estate donated by Ms. Esther Lape, Mr. Ernest Wilson, and Mr. and Mrs. John Wilson in 1971 under authority of the Migratory Bird Conservation Act of 1934, as amended. The Lape-Wilson tract, currently called the Salt Meadow Unit, was originally named the Salt Meadow National Wildlife Refuge. Additional acreage has been acquired in recent years and added to the Salt Meadow Unit. Since 1971, the Stewart B. McKinney National Wildlife Refuge (NWR) has undergone a series of name changes and expanded in size as a result of various public laws and generous donations.

Public Law 98-548, approved October 26, 1984, designated over 145 acres for the establishment of the Connecticut Coastal National Wildlife Refuge including Milford Point, and Chimon, Sheffield, and Falkner Islands. The barrier peninsula and these islands were acquired to protect and manage habitat for breeding terns, piping plovers, and wading birds. The Act authorized \$2.5 million for the

acquisition of Falkner Island by the Service delegated the operation and maintenance of the lighthouse to the U.S. Coast Guard.

Public Law 100-38, approved May 13, 1987, changed the name of the Connecticut Coastal NWR to Stewart B. McKinney NWR after late Congressman McKinney, who played a leading role in the passage of the original land acquisition authorization. Public Law 101-443, approved October 19, 1990, authorized the expansion of the Refuge and incorporated the Salt Meadow NWR into Stewart B. McKinney NWR. Since 1990, Goose Island, Outer Island, and Great Meadows Units have been acquired by the Service.

The Goose Island Unit was transferred to the Service in 1991 by donation from the Saugatuck Valley Audubon Society. Outer Island Unit was donated to the Service in October 1995 by Ms. Elizabeth Hird.

Acquisition of the Great Meadows Marsh unit occurred in response to continuing development pressure in the coastal communities of Connecticut. Portions of Great Meadows Marsh were acquired by the Service to protect critical waterfowl, wading bird and shorebird habitat from immediate and potential threats. Threats include urban development, storm water discharges, marine sand and gravel mining, marina construction, and channel dredging.

Acquisition began in 1990 when the U.S. Congress passed the Connecticut Coastal Protection Act authorizing the acquisition of "land and water known as the Great Meadows Marsh in Stratford, CT." Although the Act allowed the Service to enter into negotiations with the landowner, Stratford Land and Development Company, it did not authorize specific funds needed to execute the purchase. In February of 1993, after 20 months of negotiations the Service signed an agreement with the Stratford Land and Development Company to purchase the most critical 498 acres of marsh and adjacent upland. Six months later, Connecticut's Congressional delegation secured a 3.6 million dollar appropriation from the Land and Water Conservation Fund and the Migratory Bird Conservation Fund to purchase a portion of the Marsh. By the fall of 1994, over 400 acres of tidal wetland and upland habitat were acquired by the Service for inclusion into the Refuge.

The Calf Island Unit was recommended for the Long Island Sound Reserve Program and acquired from the YMCA in 2003. Calf Island will offer protection for birds emigrating from other wading bird colonies, such as Great Captains Island less than a mile away that supports over 300 herons and egrets. Due to the close proximity of the Calf Island Unit to New York City and heavily population areas in Connecticut, substantial public use opportunities are available.

3. Purpose and Objectives

The mission of the National Wildlife Refuge System (System) is "to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats

within the United States for the benefit of present and future generations of Americans (Sec. 4 H.R. 1420 / 16 U.S.C. 668dd(a)."

This conservation mission has been facilitated by providing Americans opportunities to participate in compatible wildlife-dependent recreation, including fishing and hunting, on System lands and to better appreciate the value of and need for fish and wildlife conservation (SEC. 2 findings).

Stewart B. McKinney National Wildlife Refuge was established as a coastal refuge in Connecticut to: 1) enhance the population of herons, egrets, terns, and other shore and wading birds on the Refuge; 2) encourage natural diversity of fish and wildlife species on the Refuge; 3) provide for the conservation and management of all fish and wildlife within the Refuge; 4) fulfill the international treaty obligations of the U.S. respecting fish and wildlife; and 5) provide opportunities for scientific research, environmental education, and fish and wildlife-oriented recreation.

B. Authority and Policy

The National Wildlife Refuge System Administration Act (U.S.C. 668 dd) of 1966 as amended by Public Law 105-107 authorizes the Secretary of the Interior to "...permit the use of any area within the System for any purpose...compatible with the major purposes for which such areas were established..."

The National Wildlife Refuge System Improvement Act of 1997 defines compatible wildlife-dependent recreation as "legitimate and appropriate general public use of the (National Wildlife Refuge) System." It establishes hunting, fishing, wildlife observation and photography, and environmental education and interpretation as "public priority uses" where compatible with the mission and purpose of individual National Wildlife Refuges.

Executive Order 12996 (March 25, 1996) entitled "Management and General Public Use of the National Wildlife Refuge System" recognizes "compatible wildlife-dependent recreational uses involving hunting, fishing, wildlife observation and photography, and environmental education and interpretation as priority public uses of the Refuge System" (Page 111 STAT. 1253). For purposes of this Act: "(1) The term 'compatible use' means a wildlife-dependent recreational use or any other use of a refuge that, in the sound professional judgment of the Director, will not materially interfere with or detract from the fulfillment of the mission of the System or the purposes of the refuge (SEC. 5. DEFINITIONS)." A process which determines the compatibility of the 6 priority uses must be completed before the use is allowed.

In addition to the National Wildlife Refuge System Administration Act, the Fish and Wildlife Coordination Act (16 U. S. C. 661-667e), and the Migratory Bird Hunting and Conservation Stamp Act (16 U.S.C. 718) contain regulatory sections authorizing the Secretary to make all appropriate rules and regulations which are necessary for the effective administration of these lands within the National Wildlife Refuge System.

This includes the authority to regulate public use activities such as hunting and fishing, providing the regulations are reasonable and appropriate, consistent with the statutory source of the regulatory authority, and compatible with the purposes for which the area was established.

Section 204 of the Connecticut Coastal Protection Act of 1990 (P.L. 101-443) authorizes the Secretary to "...administer all lands, waters, and interests therein, acquired under section 203 of this Act in accordance with the provisions of the National Wildlife Refuge System Administration Act of 1966"(16 U.S.C. 668dd). The Connecticut Coastal Protection Act adds provisions for the Secretary to "...utilize such additional statutory authority as may be available to him for the conservation and development of wildlife and natural resources, the development of outdoor recreation opportunities, and interpretive education as he deems appropriate to carry out the purposes of the refuge."

The Tidal Wetlands Act in Connecticut in 1969 requires individuals proposing to conduct activities in wetlands to obtain authorization from the DEP. *Tidal Marshes of the Long Island Sound; Ecology, History, and Restoration* summarizes the Act:

"The Connecticut Coastal Management Act (CMA) provides supplements to the State's direct regulatory authority by requiring application of the same preservation oriented standards through municipal planning and zoning, and by requiring State review of federal activities. Specifically, any federal activity, and activities within coastal towns subject to planning and zoning review, must be found consistent with the tidal wetlands standards of the CMA in order to obtain authorization" (Dreyer and Nierring 1995).

Service policy concerning hunting (Refuge Manual, Chapter 8, Paragraph 5.3) requires consideration of the following criteria and standards: (1) compatibility with the specific wildlife objectives of the refuge and the overall objectives of the National Wildlife Refuge System; (2) biological soundness; (3) economic feasibility; and (4) recreational opportunity, including a consideration of the effects of excessive demand on the quality of the hunting experience and public safety.

The Service has long recognized that hunting is an integral part of a comprehensive wildlife management program and that significant positive benefits can be attributed to a well-managed hunt. Hunting can be an effective tool for managing local populations of "resident" Canada geese.

II. PURPOSE AND NEED FOR PROPOSED ACTION

The purpose of this Assessment is to evaluate the environmental impacts of conducting a waterfowl hunting program at Stewart B. McKinney National Wildlife Refuge Great Meadows Unit. While hunting is currently not permitted on Refuge lands, historical records indicate that waterfowl hunting was a traditional public use at the Great Meadows Unit (GMU) prior to acquisition by the U.S. Fish and Wildlife Service (Service). Interest in continuing this historic public use has been expressed by local sport hunters who historically used the area and Connecticut State wildlife officials. The Refuge wishes to implement waterfowl hunting at the Great Meadows Unit as directed by the National Wildlife Refuge Improvement Act of 1997.

Legislation establishing the Refuge allows the Service to provide opportunities for fish and wildlife-oriented recreation. A recreational waterfowl hunting program may be permitted if compatible with the purposes for which the Refuge was established and funding for administering a waterfowl hunt is appropriated. A Compatibility Determination will address the biological impacts of the establishment of a waterfowl hunting program at the GMU.

The waterfowl hunting program will be conducted in accordance with State of Connecticut (State) regulations and National Wildlife Refuge System regulations contained in Title 50 of the Code of Federal Regulations (50 CFR). Hunt days will be limited to Tuesdays, Wednesdays, and Saturdays throughout the State established waterfowl hunting season. **Appendices A and B** contain the State's 2004 Migratory Bird Hunting Guide and Hunting Laws and Regulations. All other Units of the SBMNR will remain closed to hunting until opportunities are assessed and approved by the SMNR Comprehensive Conservation Plan (CCP) scheduled to be initiated in 2005.

III. THE PROPOSED ACTION AND ITS ALTERNATIVES

During the planning process, three alternatives, including the proposed action and no action alternatives, were developed. The alternatives are:

A. Alternative 1 – NO ACTION

All areas of the Great Meadows Unit remain closed to hunting.

B. Alternative 2 – PROPOSED ACTION

Open designated areas of Great Meadows Unit, 165 acres in size as indicated in Figure 11, to the hunting of waterfowl. Under this alternative, waterfowl hunting would be permitted in designated areas only, under controlled conditions, and in accordance with State and Federal regulations. Hunt days would be limited to Tuesdays, Wednesdays, and Saturdays throughout the State established waterfowl hunting season. Hunters would be required to obtain a Special Use Permit from the Service. The Refuge will issue permits to hunt the designated hunting area of the Great Meadows Unit for the entire state waterfowl season. Hunter numbers will be limited according to state regulations for party size and distance between parties. In the future, hunter numbers could be limited by assigning permits to designated blinds or areas of the marsh to ensure a quality hunting experience. Hunting regulations would be described in a Refuge Hunt Program and may also include special restrictions on hunting methods, bag limits, and/or fixed hunting season dates or lengths. All other units of the Stewart B. McKinney National Wildlife Refuge and areas within the Great Meadows Unit would remain closed to hunting.

C. Alternative 3

Open the entire Great Meadows Unit to the hunting of waterfowl. Under this alternative, all areas within the Great Meadows Unit would be opened to waterfowl hunting, conducted under controlled conditions, and in accordance with State and Federal regulations. Hunters would be required to obtain a Special Use Permit from the Service. The Refuge will issue permits to hunt the designated hunting area of the Great Meadows Unit for the entire state waterfowl season. Hunter numbers will be limited according to state regulations for party size and distance between parties. In the future, hunter numbers could be limited by assigning permits to designated blinds or areas of the marsh to ensure a quality hunting experience. Hunting regulations would be described in a Refuge Hunt Program and may also include special restrictions on hunting methods, bag limits, and/or fixed hunting season dates or lengths. Hunters may not erect permanent structures on nor remove vegetation from the Refuge. All other units of the Stewart B. McKinney National Wildlife Refuge would remain closed to hunting.

IV. AFFECTED ENVIRONMENT

Figure 2 represents the Great Meadows Unit property currently under Service ownership and parcels within the acquisition boundary. This section describes in detail the environment to be affected by a waterfowl hunting program at the Great Meadows Unit.



Figure 2. Great Meadows Unit current property boundaries and property approved for acquisition. Blue outlined areas represents Refuge boundary, pink shaded areas represent approved the acquisition boundary.

A. Physical Considerations

1. Climate

The Connecticut Coast lies in the humid zone of the temperate climate range and experiences warm summers and cold winters. The climate is influenced year-round by the moderating effects of the Atlantic Ocean and Long Island Sound. According to NOAA's 100 year averages (1901-2001), the average daily summer temperature is 68.7 degrees Fahrenheit and the average daily winter temperature is 27.5 degrees

Fahrenheit (NOAA website). Annual precipitation averages 47 inches, with approximately 39 inches of snowfall each year. Thunderstorms occur on an average of 22 days each year, primarily during the summer months (USFWS 1989a).

2. Geology, Topography and Soils

The Connecticut Coast was shaped by gradual submergence which produced a series of flooded valleys and a fringe of islands, peninsulas, channels and bays. Except for the lowlands of the Connecticut River Valley, the coast is made up of gently rolling hills and rock outcrops, known as the Southern New England Uplands. Upland soils are composed chiefly of sands, gravels, and clays with fertile loam depressions.

Glacial deposits comprise the islands and barrier beaches currently found along the Connecticut coast. Glacial sediment carried down the Housatonic River and deposited at its mouth created sand and mud flats along the coast of Stratford. Coastal sand and mud flats provide ideal sites for salt marsh formation. Marsh substrate consists of gravel and sand soils overlain with organic peat soils grading to silt in some areas. Tidal marsh soil is classified as Westbrook Mucky Peat (USFWS 1989a).

Nearly level to moderately steep loamy soils characterize the coastlines of Stratford and Bridgeport. In 1955, the Army Corp of Engineers used material contaminated with heavy metals and dredged from Bridgeport Harbor to construct dikes within the GMU. The Service studied organochlorine and heavy metal levels during a Level II Pre-Acquisition Survey, and further analyzed sediment for chromium, pesticides, chlorinated herbicides, semivolatile organics, ETPH, PCBs, TOC, and grain size. Both studies concluded levels to be far below threshold concentrations, and therefore do not pose a threat to the public or to wildlife.

3. Hydrology and Water Quality

Great Meadows Marsh and Lewis Gut are located within the Great Meadows Marsh drainage sub-basin, within the Southwest Coast Basin, and west of the Housatonic River Basin.

Erosion of the main headland to the east of Great Meadows formed the Long Beach peninsula. The protection of Long Beach by the back-barrier lagoon, Lewis Gut, encouraged the formation of the Great Meadows salt marsh complex. The Lewis Gut system once supported 1,450 acres of tidal wetlands, of which 406 acres (28%) remains today. The integrity of the hydrological regime and water quality of the Great Meadows system have been impacted throughout the years by land use changes and urban development, such as the construction of the Bridgeport-Sikorsky Airport, Lordship Boulevard, landfills, and the disposal of dredged material for industrial, commercial, and residential areas (USFWS 2001).

Sources of freshwater to the Lewis Gut embayment include a ditch extending from Frash Pond to the GMU and storm water runoff from adjacent areas. Prior to significant urban development of the past century, Neck Creek connected Lewis Gut to the Housatonic River. Due to extensive tidal flushing, Lewis Gut is strongly influenced by the water quality of Bridgeport Harbor and Johnsons Creek. Both areas experience periodic high counts of coliform bacteria (King's Mark 1987). Heavy industrial and residential development contributed to the poor sediment quality, the potential for contamination from heavy metals, and low dissolved oxygen levels of Bridgeport Harbor (CT DEP 1998).

Historical aerial photographs reveal three ponds on the Great Meadows Unit. Two are currently dominated by open water and the third is a depression dominated by common reed (*Phragmites australis*). In 2001, Service staff found the salinity of the largest pond at GMU (2.72 acres) to be 2-3 parts per thousand (ppt). Water temperatures of this pond during winter vary from of -0.1C at the surface to 3.0C near the bottom. The low salinity may be a result of saltwater intrusion through storms and dike breeches or salt leaching from the surrounding dredge spoil (USFWS 2001).

The smallest pond (0.70 acres) had a salinity of 11-12 ppt at the surface and 20 ppt in February and 10 ppt on the surface in July of 2001. Although trivalent chromium occurs in sediment of the ponds below threshold concentrations, precautions should be taken to avoid direct dermal contact by humans to prevent skin irritation (www.osha-slc.gov/SLTC/healthguidelines/chromium3/recognition.html). The ponds are located in areas closed to the public.

B. Biological Resources

1. Vegetation and Habitat Type

The Great Meadows Marsh system, which includes properties owned by both the Service and the Town of Stratford, is comprised of tidal salt marsh, filled wetlands and upland, barrier beach, and the Lewis Gut embayment. This 600 acre complex is a remnant of what was once an extensive tidal-marsh system covering approximately five square miles extending from Johnsons Creek in the west to the Housatonic River in the east (King's Mark ERT 1987).

The high and low marsh are two distinct zones in typical salt marshes distinguished by elevation and vegetative communities. The high marsh is a terrestrial environment dominated by vegetation and regularly flooded by spring tides, while a narrow band along the waterward edge signifies the low marsh (Dreyer and Nierring 1995).

The Northeast Coastal Areas Study (1991) identifies this area as the Lower-Housatonic River-Great Meadows Marsh Complex, an important coastal habitat site containing the largest block of unditched high salt marsh (225 acres/91 ha) in

Connecticut. According to the National Wetlands Inventory, the Great Meadows Marsh includes both regularly-flooded and irregularly-flooded estuarine emergent marsh. Salt marshes contain about 60 percent low marsh dominated by smooth cordgrass (*Spartina alterniflora*) and 40 percent high marsh, characterized by saltmeadow cordgrass (*Spartina patens*) (Niering, 1977). High marsh areas are commonly interspersed with Spikegrass (*Distichlis spicata*) and various forbs such as Sea Lavender (*Limonium nashii*), Pink Gerardia (*Gerardia maritima*), Arrowgrass (*Triglochin maritima*), Seaside Plantain (*Plantago maritima*), and Saltmarsh Aster (*Aster tenuifolius*) (Dreyer and Nierring 1995).

Below Lordship Boulevard and the main dikes, the marsh is finely dissected by tidal creeks and channels. Salt pannes and tidal mud and sand flats are also characteristic of this area. Areas north of the dikes are dominated by pure stands of common reed (*Phragmites australis*). The several small fresh or brackish ponds identified in the last section (II.A.3. Hydrology and Water Quality) are located in this area. The largest pond hosts some submerged aquatic vegetation (USFWS 1989a).

Long Beach is part of a coastal barrier beach system extending two miles west of Point No Point in Stratford to Bridgeport Harbor in Bridgeport. Long Beach contains several habitats including beach, sand dunes, tidal wetlands, and sand flats. Portions of Long Beach bordering Long Island Sound are relatively unvegetated with a variety of annual plants growing near the wrack-line at the western end. Low dunes behind the beach support beach grass (*Ammophila brevilagatum*). Tidal salt marsh, dominated by saltmarsh cordgrass, occurs along the bayside edges and slopes down to extensive mudflats covered with sea lettuce (*Ulva lactuca*).

Figure 8 (page 20) includes rare plant species found in the Great Meadows/Long Beach area as listed by the State of Connecticut Department of Environmental Protection Natural Diversity Database (March 14, 1998).

2. Wildlife

Located along the Atlantic Flyway, the Great Meadows Unit is an important site for migratory birds including waterfowl, shorebirds, wading birds, raptors, and passerines. The GMU was recognized in the Atlantic Coast Joint Venture Plan of the North American Waterfowl Management Plan (USFWS 1989b). Over 270 species of birds have been observed on or near the area since 1900 (King's Mark 1987). In the 1920s, Roger Tory Peterson, Allan Cruickshank and other prominent ornithologists regularly traveled by train from New York City to Stratford Great Meadows to birdwatch, then the premier habitat in the entire greater metropolitan New York region (TNC 1993). The GMU bird list, **Appendix C**, includes all bird species observed at the Unit, identifying the seasonal abundance and species listed on Federal and/or State endangered species lists. Records of fish, reptiles, and invertebrates are also reviewed in this section.

a. Waterfowl

The Great Meadows marsh and Lewis Gut are important feeding and staging areas during winter storms for Canada Geese (*Branta canadensis*), American black ducks (*Anas rubripes*), mallards (*Anas platyrhynchos*), and diving ducks such as scaup (*Aythya* spp.), common goldeneye (*Bucephala clangula*), bufflehead (*Bucephala albeola*), and old squaw (*Clangula hyemalis*) (USFWS 1989a). Species which have historically nested at Great Meadows include pied-billed grebe (*Podilymbus podiceps*), gadwall (*Anas strepera*), black duck, mallard, green-winged teal (*Anas crecca*), blue-winged teal (*Anas discors*), northern shoveler (*Anas clypeata*), mergansers (*Mergus merganser*), and bufflehead (King's Mark 1987 and USFWS 1989a). Waterfowl and shorebirds heavily utilize the tidal mud flats and the high marsh when feeding.

The Connecticut DEP conducts statewide midwinter waterfowl (aerial) surveys in coordination with the annual USFWS national census. Areas surveyed include the coastal region of Connecticut and major rivers and selected lakes within ten miles of the Long Island Sound. Connecticut mid-winter waterfowl survey data were provided by the CT DEP for the years 1954-2006 (Figure 1) (CT DEP 2007). Dabbling ducks include mallard, American black duck, gadwall, American wigeon, green-winged teal, northern shoveler, and northern pintail. Diving ducks include redhead, canvasback, scaup, ringneck duck, common goldeneye, bufflehead, ruddy duck, eider, scoter, long-tailed duck, and merganser. This data has been broken down by dabblers, divers, seaducks, and geese for 2001-2006 (Figure 2) (USFWS 2007 and CT DEP 2007).

Long term standardized waterfowl survey data are not available for the Great Meadows Unit. Historical records, incidental observations, and periodic ground surveys collectively identify the significance of Great Meadows to waterfowl. Figures 4, 5, 6, and 7 demonstrate the abundance of Canada geese, diving ducks, black ducks, and puddle ducks respectively observed at the GMU during surveys conducted by Refuge personnel (1997-1999). Peak waterfowl use occurs from October to March for all species. The most abundant species utilizing the area during the survey period in respective order are the black duck, Canada goose, gadwall, mallard, and red-breasted merganser.

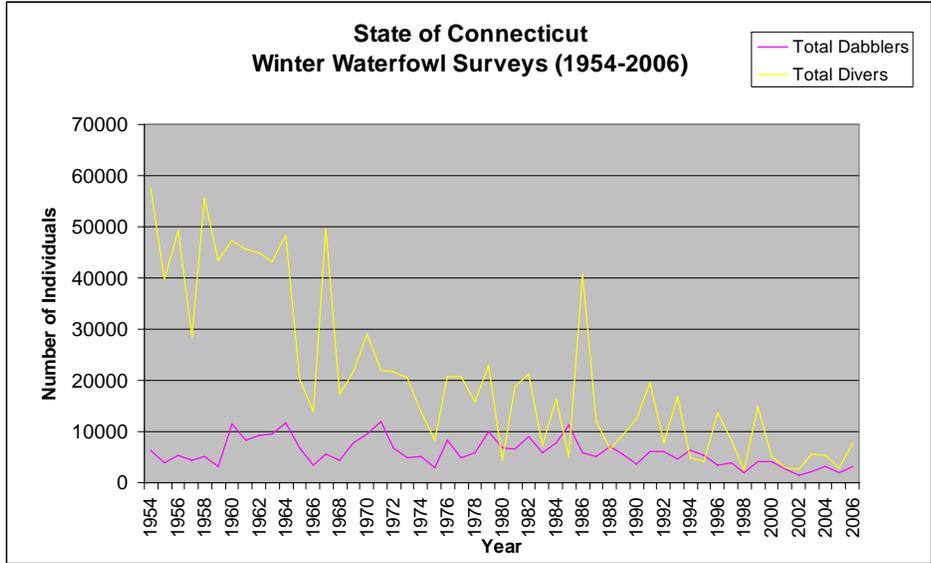


Figure 3. CT DEP Winter Waterfowl Survey results from 1954-2006.

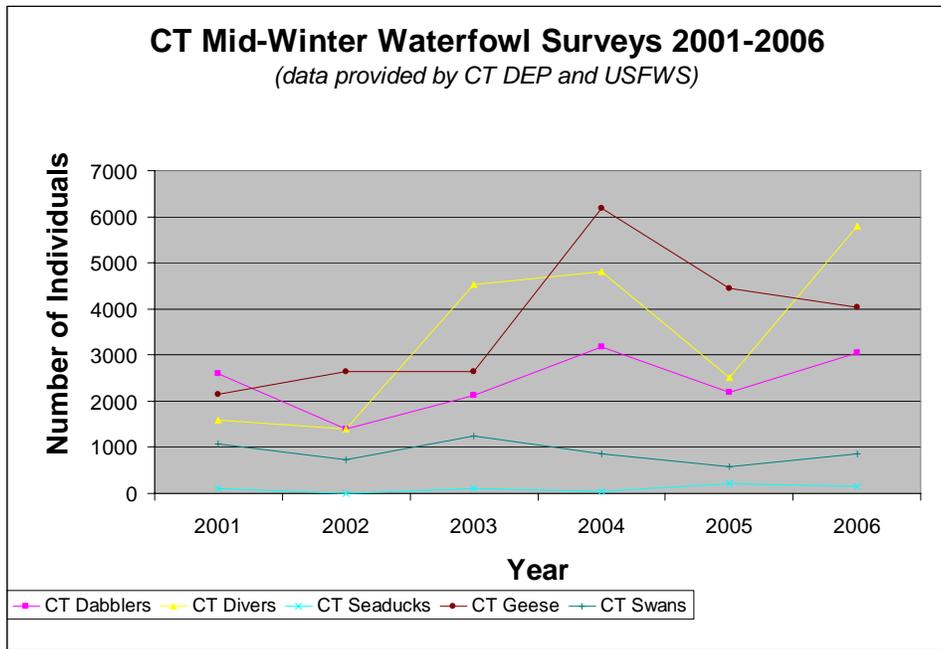


Figure 4. Mid-winter waterfowl survey results for Connecticut from 2001-2006.

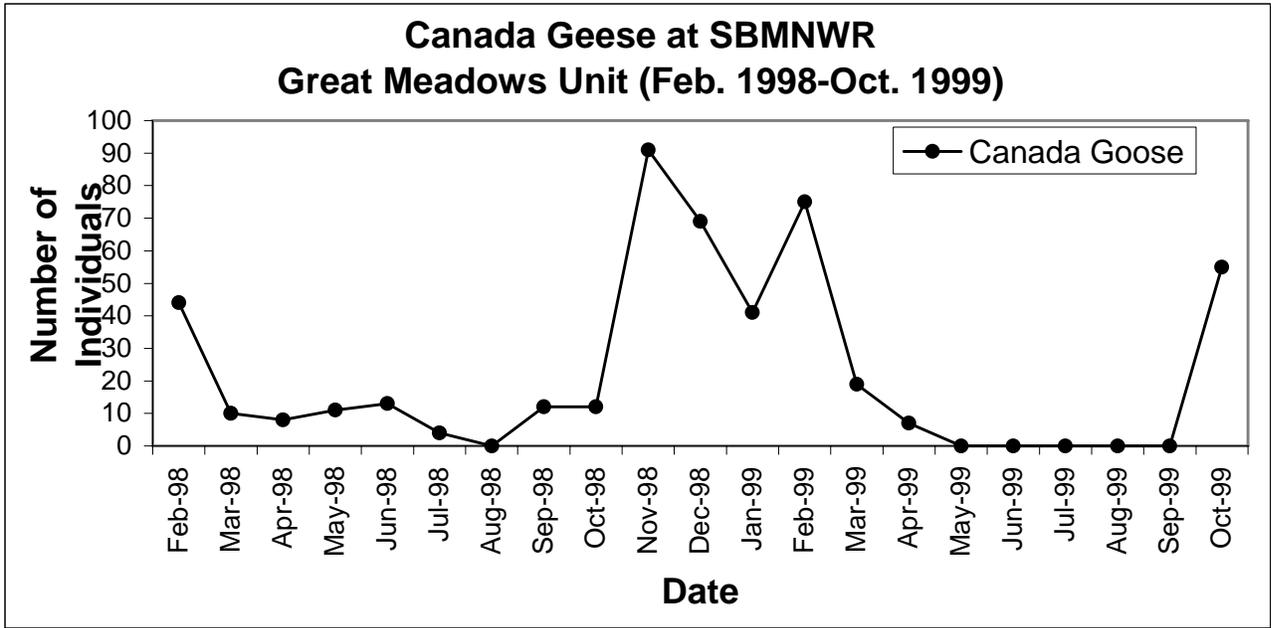


Figure 5. Canada Geese observed during SBMNWR Great Meadows Unit surveys conducted by Refuge personnel from February 1998 to October 1999.

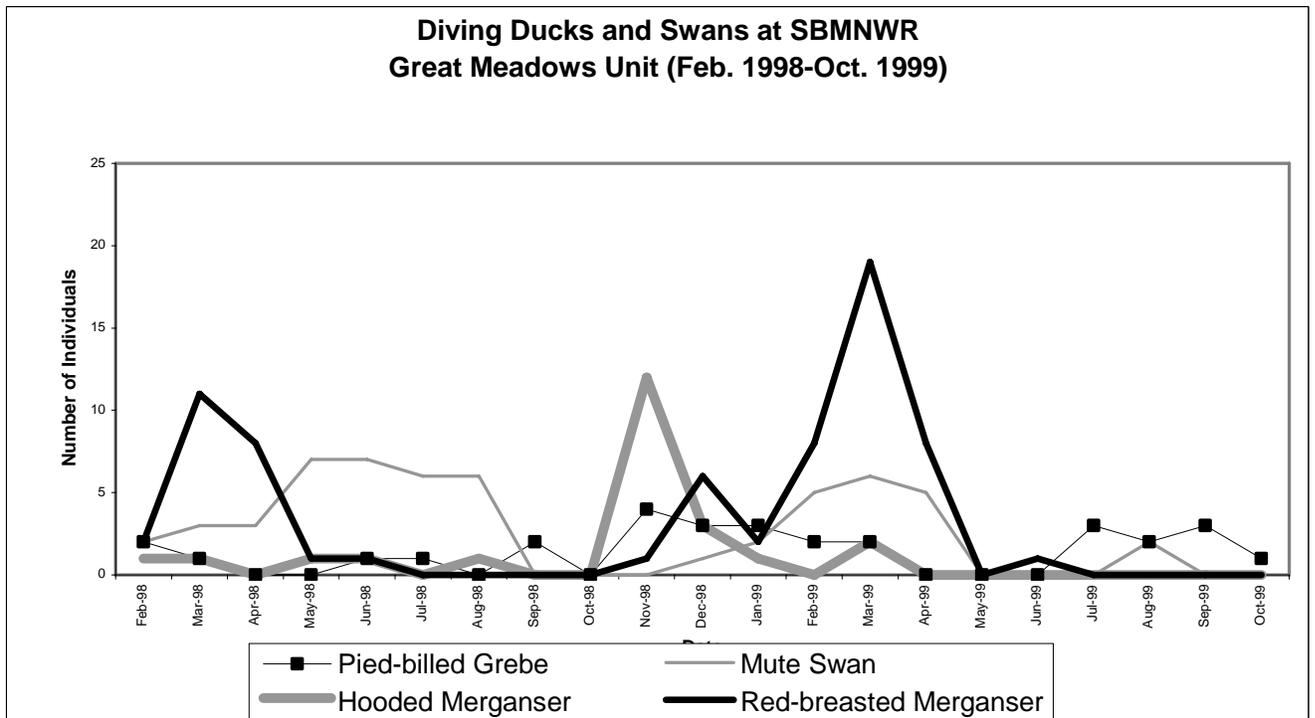


Figure 6. Diving Ducks and Swans observed during SBMNWR Great Meadows Unit surveys conducted by Refuge personnel from February 1998 to October 1999.

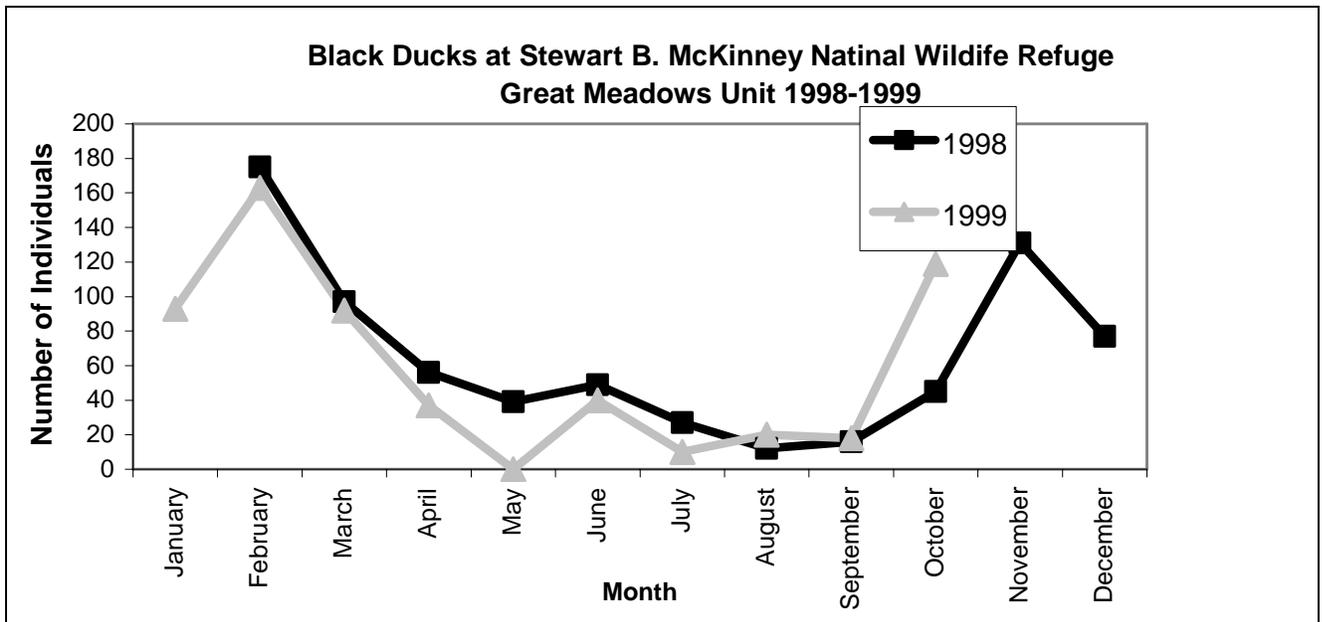


Figure 7. Black ducks observed during SBMNWR Great Meadows Unit surveys conducted by Refuge personnel from February 1998 to October 1999.

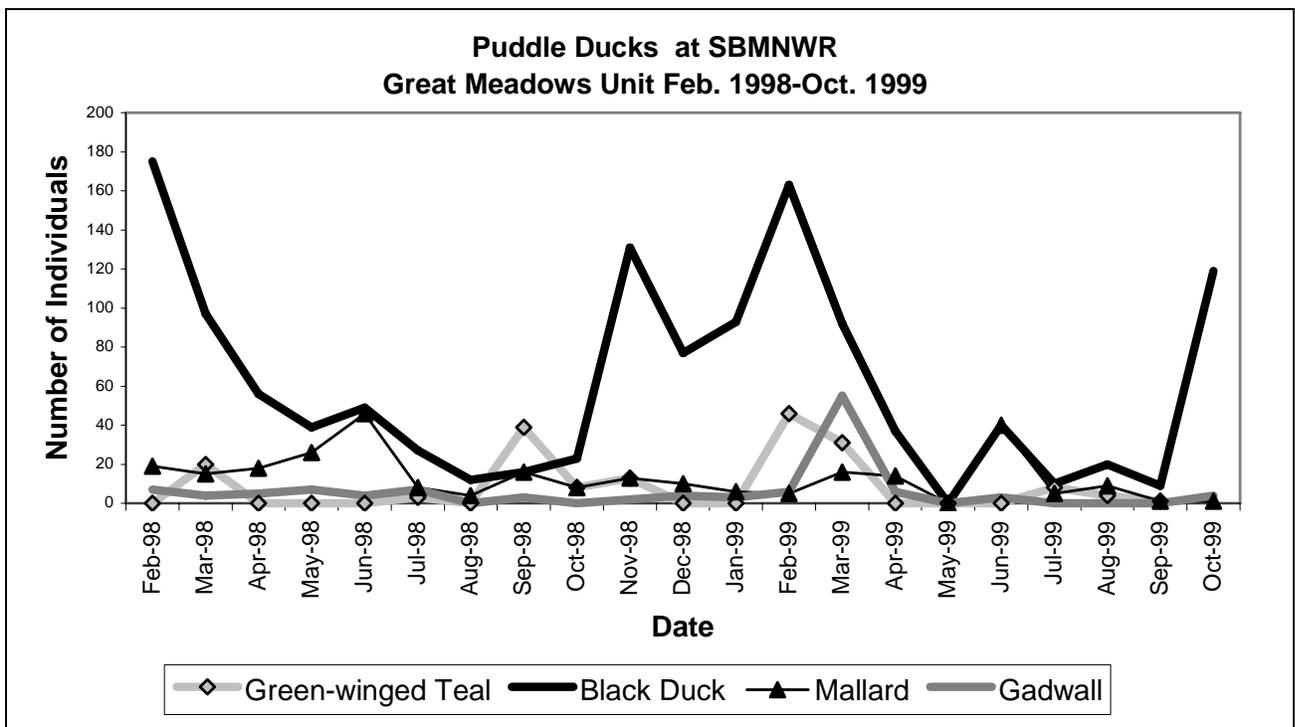


Figure 8. Puddle ducks observed during SBMNWR Great Meadows Unit surveys conducted by Refuge personnel from February 1998 to October 1999.

b. Shorebirds, Gulls, and Terns

Protected or undisturbed portions of Long Beach support nesting populations of piping plovers (*Charadrius hiaticula*), American oystercatchers (*Haematopus palliatus*), common terns (*Sterna hirundo*), least terns (*S. antillarum*), killdeer (*Charadrius vociferus*), and spotted sandpipers (*Actitis macularia*).

More than 5000 individual shorebirds roost on backdune sandflat communities of Pleasure and Long beaches during migration (USFWS 1991). Nesting and migrating shorebirds, gulls, and terns utilize the Great Meadows marsh as a feeding and loafing area. Wintering residents include herring gulls, great black backed gulls, and double crested cormorants.

c. Wading Birds

Intertidal flats of Great Meadows are prime feeding areas for wading birds such as snowy egrets (*Egretta thula*), great egrets (*Casmerodius albus*), little blue herons (*Egretta caerulea*), and green herons (*Butorides virescens*). Marshbird Callback Surveys (2000-2001) indicate the importance of GMU as a breeding ground for clapper rails (*Rallus longirostris*) and Virginia rails (*Rallus limicola*). Black-crowned night herons (*Nycticorax nycticorax*), green-backed herons (*Butorides striatus*), and least bitterns (*Ixobrychus exilis*) have also been recorded in Great Meadows Unit.

d. Raptors

The upland and filled wetland area around Great Meadows are used by migrating, breeding, and wintering raptors such as sharp-shinned hawks (*Accipiter striatus*), northern harriers (*Circus cyaneus*), red-tailed hawks (*Buteo jamaicensis*), turkey vultures (*Cathartes aura*), American kestrels (*Falco sparverius*), and merlins (*Falco columbarius*). The only documented active northern harrier nest in the state of Connecticut was first recorded at the GMU in 1997. Although nest site location has changed over the years, northern harriers continue to nest on the Great Meadows Unit. Refuge staff have observed as many as four individuals at once during winter waterfowl censuses, indicating harriers not only forage at the GMU in winter but may also roost communally. Occasional sightings of the bald eagle (*Haliaeetus leucocephalus*) and peregrine falcon (*Falco peregrinus*) also have been recorded.

e. Passerines

Great Meadows Unit marsh is a valuable migration stopover for over 100 species of songbirds including seaside sparrows (*Ammodramus maritimus*) and saltmarsh sharp-tailed sparrows (*Ammodramus caudacutus*), both state species of concern. The Great Meadows Bird List (Appendix C) consists of species

sited during historical ornithological observations and regional Refuge Landbird Breeding Surveys.

f. Fish and Reptiles

The Housatonic River supports important anadromous fish runs for American shad (*Alosa sapidissima*), sea-run brown trout (*Salmo trutta*), alewife (*Alosa pseudoharengus*), blueback herring (*Alosa aestivalis*), striped bass (*Morone saxatilis*), white perch (*Morone americana*) and Atlantic sturgeon (*Acipenser oxyrinchus*) (USFWS 1991).

Topminnows and killifish (*Fundulus spp.*) were found in both ponds during site visits, with possible sticklebacks (Family Gasterosteidae), sheepshead minnows (*Cyprinodon variegatus*) and eels in the small pond (USFWS 2001). Figure 7 demonstrates finfish species occurring in Lewis Gut/Long Beach (King's Mark 1987). The table represents species that are known to inhabit the Lower Housatonic River-Great Meadows Marsh Complex or are indigenous to Connecticut coastal habitats of this type.

Northern diamondback terrapins (*Malaclemys t. terrapin*), a state-regulated species of management concern, nest on Long Beach and Great Meadows and are found in large numbers in the tidal creeks of Great Meadows Unit. Refuge personnel have located red-backed salamanders and garter snakes on the property.

g. Invertebrates

The mouth of the Housatonic River contains important natural shellfish beds, particularly for American oysters (*Crassostrea virginica*) and hard-shelled clams (*Mercenaria mercenaria*). Although invertebrate surveys of the Great Meadows Unit have not been conducted, typical salt marshes most likely characterize the Great Meadows. According to the *Tidal Wetland Ecology of Long Island Sound (Parts 2 and 3)*, the Ribbed Mussel (*Geukensia demissa*), Marsh fiddler or Black Fiddler (*Uca pugnax*), Red-jointed Fiddler (*Uca minax*), Marsh crab (*Sesarma reticulatum*), Striped Sea Anenome (*Haliplanella luciae*), Common Clamworm (*Nereis succinea*), Rough Periwinkle (*Littoria saxatilis*), and Mud Snail (*Ilyanassa obsoleta*) can be found in the low marsh, while the Saltmarsh Snail, Saltmarsh Isopod (*Philosocia vittata*), and Saltmarsh Amphipod (*Orchestia grillus* and *O. uhler*) are found in typical high salt marsh ecosystems.

Long Beach/Lewis Gut Seasonal Finfish Occurrence*						
Common Name	Scientific Name	Area	Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec
Alewife	<i>(Alosa pseudoharengus)</i>	G	A	S	A,J	A,J
Blackfish	<i>(Tautoga onitis)</i>	B,G	-	S	S,J	A,J
Bluefish	<i>(Pomatomus saltatrix)</i>	0	-	A	A,J	A,J
Butterfish	<i>(Peprilus triacanthus)</i>	B	-	A	A	-
Cunner	<i>(Tautogolabrus adspersus)</i>	B,G	A	S	S,J	A,J
American Eel	<i>(Anguilla rostrata)</i>	G	-	A	A	A
Summer Flounder	<i>(Paralichthys dentatus)</i>	B	-	A	A	-
Winter Flounder	<i>(Pseudopleuronectes americanus)</i>	B,G	S	S	A,J	A,J
Windopane Founder	<i>(Scophthalmus aquosus)</i>	B,G	A	S	S,J	A,J
Killifish	<i>(Fundulus spp.)</i>	G	A	S	S,J	A,J
Mackerel	<i>(Scomber scombrus)</i>	B,G	-	A	A	-
Menhaden	<i>(Brevoortia tyrannus)</i>	B,G	-	A	A	-
Pipefish	<i>(Syngnathus fuscus)</i>	B,G	S	S,J	A,J	A,J
Rainbow Smelt	<i>(Osmerus mordax)</i>	B,G	S	S,J	J	J
Sand Lace	<i>(Ammodytes americanus)</i>	B,G	-	A	A	S
Scup	<i>(Stenotomus chrysops)</i>	B,G	-	S	S	-
Sheepshead Minnow	<i>(Cyprinodon variegatus)</i>	G	A	S	S,J	A,J
Silversides	<i>(Menidia menidia)</i>	G	A	S	S,J	A,J
Sticklebacks	<i>(Apeltes spp., Gasterosteus spp.)</i>	G	A	S	S,J	A,J
Striped Bass	<i>(Morone saxatilis)</i>	B,G	-	A	A	A
Tomcod	<i>(Microgadus tomcod)</i>	G	S, J	A	A,J	S,J
Weakfish	<i>(Cynoscion regalis)</i>	B	-	S	S,J	A,J
White Perch	<i>(Moron americanus)</i>	G	A	S	A,J	A,J

Areas: B - Long Beach Area
G - Lewis Gut / Great Meadows

Occurrence: A - Adults (>=1 year)
S - Spawning adults
J - Young of the year juveniles
- - Not present

*Table 3, Page 61. King's Mark Environmental Review Team. 1987. Environmental Review Team Report: Long Beach, Stratford, CT. Wallingford (CT): King's Mark Resource Conservation and Development Area, Inc. 83 pp.

Figure 9. Long Beach/Lewis Gut Seasonal Finfish Occurrence (King's Mark 1987).

h. Mammals

Eighty four mammalian species are found in Connecticut, including 11 state listed species and 3 federally listed species (CT DEP 2005). None of the listed species in Figure 10 have been documented at the Great Meadows Unit (see Figure 11, CT Natural Diversity Database information).

Common Name	Scientific Name	State Endangered (E) or Species of Concern (SC)
Least Shrew	Cryptotis parva	E
Eastern Woodrat	Neotoma magister	SC *
Southern bog lemming	Synaptomys cooperi	SC
Silver-haired bat	Lasionycteris noctivagans	SC
Red bat	Lasiurus borealis	SC
Hoary bat	Lasiurus cinereus	SC
Eastern small-footed bat	Myotis leibii	SC *
Indiana bat	Myotis sodalist	E +
Gray wolf	Canis lupus	SC *^
Eastern cougar	Puma concolor couguar	SC *+
Harbor porpoise	Phocoena phocoena	SC

Figure 10. State listed mammals of Connecticut (CT DEP 2004). Key to symbols used: *Believed Extirpated; +Federally Endangered; ^Federally Threatened.

The combination of salt marsh and upland habitat in an urbanized landscape limits the species richness and distribution at the Great Meadows Unit. Many species typical of the Unit are not unique to salt marshes, but are generalists, commonly found in urban areas and utilizing both the upland and salt marsh habitats. The Refuge has not conducted mammalian surveys at the Unit, but incidental observations by Refuge staff and volunteers confirms the presence of white-tailed deer, coyote, red fox, raccoon, small mammals such as voles, eastern grey squirrels, and eastern cottontails. White-footed mice (*Peromyscus leucopus*) and meadow voles (*Microtus pennsylvanicus*) are commonly found in New England salt marshes and as a prey base, attract many predatory mammals to the marsh such as mink, otter, fox, otter, and long-tailed weasels (Teal 1986).

3. Endangered, Threatened and Special Concern Species

Several federal and Connecticut state-listed species occur within the barrier beach-tidal wetland complex at the mouth of the Housatonic River. Notable state species for Stratford, Great Meadows are listed in Figure 11, as reported by the CT DEP Natural Diversity Database on March 1998 and April 2003.

The federally threatened and state endangered bald eagle (*Haliaeetus leucocephalus*) and state endangered species such as the peregrine falcon and sharp-shinned hawk are occasionally seen at the Great Meadows Unit. The GMU serves as a possible short-eared owl (state threatened) wintering roost. The peregrine falcon, red-shouldered hawk, and short-eared owl are listed on the 1995 U.S. Fish and Wildlife Service Non-game Species of Management Concern in the northeast region, Region 5 (USFWS 1995).

The Great Meadows Unit provides foraging habitat for the federally and state (CT) threatened piping plover and state threatened least tern which breed on the

adjacent Long Beach. State endangered, threatened, and/or special concern species which have been sighted and potentially breed on the Refuge include the salt marsh sharp-tailed, seaside, and savannah sparrow, the horned lark, northern harrier, and pied-billed grebe (Bevier 1994), all of which are marsh or grassland obligates. In addition to breeding, the northern harrier and pied-billed grebe also overwinter at GMU (Schneider and Pence 1992). Although harriers are highly visible species when hunting, nests are cryptically located directly on the ground or less than five feet above the ground in hummock or in thick vegetation (Erlich et al 1988, Andrlle and Carroll 1988). Harriers arrive on breeding grounds in the Northeast from mid-March to early April and lay eggs from mid-April to mid and late June (Schneider and Pence 1992). The Refuge limits public use during the nest site establishment period and prohibits public access to the nesting area until fledging. Any winter roosting sites of the harrier will also be closed to the public.

The state endangered plants the coast violet (*Viola brittoniana*) and marsh pink (*Sabatia stellaris*), occur in the Great Meadows Unit. These species are located in closed areas of the Refuge where access is prohibited year round.

Connecticut Department of Environmental Protection			
Stratford Great Meadows Natural Diversity Data Base Records (April 2003)			
Scientific Name	Common Name	Federal Status	State Status
<i>Ammodramus caudacutus</i>	Sharp-tailed sparrow		SC
<i>Ammodramus maritimus</i>	Seaside sparrow		SC
<i>Aristida tuberculosa</i>	Beach needlegrass		E
<i>Bartramia longicauda</i>	Upland sandpiper		E
<i>Botaurus lentiginosus</i>	American bittern		E
<i>Catoptrophorus semipalmatus</i>	Willet		SC
<i>Charadrius melodus</i>	Piping Plover	LT	T
<i>Circus cyaneus</i>	Northern harrier		E
<i>Eremophila alpestris</i>	Horned lark		T
<i>Gallinula chloropus</i>	Common moorhen		E
<i>Honckenya peploides</i>	Sea-beach sandwort		SC
<i>Ixobrychus exilis</i>	Least bittern		T
Major heron feeding area			
Owl winter roost			
<i>Passerculus sandwichensis</i>	Savannah sparrow		SC
<i>Passerculus sandwichensis princeps</i>	Ipswich sparrow		SC
<i>Podilymbus podiceps</i>	Pied-billed grebe		E
<i>Rallus elegans</i>	King rail		
<i>Sabatia stellaris</i>	Marsh sea-pink		E
Salt Marsh			
Saltwater intertidal beaches and shores			
Saltwater intertidal flat			
<i>Scirpus paludosus var. atlanticus</i>	Bayonet grass		SC
<i>Sporobolus asper</i>	Dropseed		
<i>Sterna antillarum</i>	Least tern		T
<i>Sterna dougallii</i>	Roseate tern	LE	E
<i>Toxostoma rufum</i>	Brown thrasher		
Other Species Listed in the March 14, 1998 Natural Diversity Data Base Records:			
<i>Chrysopsis falcata</i>	Sickle-leaved golden aster		E
Coastal Sand Dunes			
<i>Diplachne maritima</i>	Saltpond grass		E
<i>Liatris scariosa var novae-angliae</i>	New England blazing-star		SC
<i>Malaclemys terrapin</i>	Diamond-backed terrapin		
<i>Opuntia humifusa</i>	Eastern prickly pear		SC
<i>Panicum amarum</i>	Panic grass		T
<i>Viola brittoniana</i>	Coast violet		E

Figure 11. Connecticut Department of Environmental Protection, Great Meadows Natural Diversity Database (March 14, 1998 and April 2003).

C. Socioeconomic Considerations

1. Historical Resources

Great Meadows Unit was used by both Native Americans and early European settlers. Decades before the arrival of the first settlers in 1639, Native Americans inhabited the Johnsons Creek area each summer and actively used the marsh for fishing, oystering, clamming, and hunting game birds.

Rich game, fish, shellfish and other natural resources in and around Great Meadows Unit supported seasonal and permanent settlements. Productive oyster beds supported a historically important industry and abundant salt marsh hay offered open grazing pasture for cattle and material for roof thatching. Other practical uses for marsh and beach plants included candles, jelly, tea, and seasonings for food and salad.

Several historic sites in and around Great Meadows Unit, including campsites and ceremonial areas, have been identified by a local archaeologist. To date, many primitive artifacts have been removed from these sites and catalogued.

Great Meadows marsh was historically used for hunting. While no formal hunting policy existed prior to 1992, anecdotal evidence indicates that the marsh was heavily used by hunters. In 1992, the landowner (Stratford Land and Development Company) met with State conservation officers to establish guidelines for access to their property. The Stratford Land and Development Company issued access permits to hunters already holding a valid State hunting permit. The Connecticut Recreational Use Statute (General Statutes of Connecticut Sec. 52-557g and Sec. 52-557h) exempts landowner liability to those who allow recreational use of property to the public free of charge. After obtaining permission from Stratford Land and Development Company, hunters could hunt waterfowl and small game per State regulations on the Company's property. Approximately 80 access permits were issued annually to hunters by the previous landowner; this equals approximately 600 hunter-days of recreation (based on a state average of 7.5 hunting days/hunter/year - USFWS 1996). Opening the Great Meadows Unit to small game hunting will be addressed in the Stewart B. McKinney NWR Comprehensive Conservation Plan, to be completed in future years.

The distribution of permits by the Stratford Land and Development Company was curtailed in January 1994, shortly after the Service expressed interest in acquiring the property. After critical portions of Great Meadows marsh were acquired by the Service for inclusion into the Refuge, Jim Caissy, Vice President of Stratford Land and Development

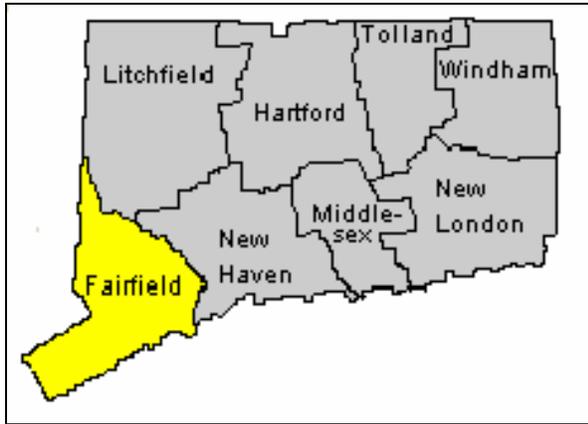


Figure 12. Counties in the state of Connecticut. (<http://magiv.lib.uconn.edu>)



Figure 13. Towns and Cities of Fairfield County, Connecticut. (<http://www.state.ct.us/ecd/research/maps/map%20images/fairfield-county.jpg>)

2. Area Population Profiles

Stratford, located in Fairfield county, has a high potential of visitor use due to its close proximity to statistically significant populated areas, such as New York City, NY and the Connecticut cities of Bridgeport and New Haven (Figure 12). Approximately 25% of the total Connecticut population lives in the 625.85 square miles designated as Fairfield County (see **Appendix D**, 2001 Town Profile for Stratford).

The Connecticut population for the 2000 U.S. Census totaled 3,405,565 (<http://www.census.gov>). Fairfield County had a population of 843,929 (www.state.ct.us/ecd/research) in 1998, which includes the town of Stratford (1998=48,989) and Bridgeport (2000=139,529; from www.sots.state.ct.us/RegisterManual/SectionVII/popTOWNS.htm). Figure 13 demonstrates the proximity of other Fairfield County towns and to Stratford.

3. Current and Potential Land Use

Great Meadows Unit provides an excellent opportunity for environmental education. Since 1970, Great Meadows Unit Guides of Stratford, Connecticut, under the auspices of "Protect Your Environment of Stratford," has offered guided tours of the marsh and Long Beach. It is anticipated that use of Great Meadows Unit will be in great demand by school groups from nearby cities and towns (Figure

10). An interpretive trail is currently being constructed and will facilitate outdoor activities of educational groups and visitors. Great Meadows Unit, developed as a wildlife observation, education and passive recreation center, could play a vital role in the economic revival of the Bridgeport region.

The Great Meadows Unit is currently closed to the public, with access granted upon the terms and conditions of a Special Use Permit. This policy will remain in effect until public trails within the Unit are constructed, parking places designated, and habitat restoration work completed. Public use of the Unit will be limited by available parking spaces and restricted to designated trails.

V. ENVIRONMENTAL CONSEQUENCES

A. Alternative 1 – No Action – All areas within the Great Meadows Unit remain closed to waterfowl hunting.

1. Physical Considerations

The physical characteristics of the Great Meadows Unit would remain undisturbed by keeping the area closed to hunting. Restricting waterfowl hunting in open areas of the Great Meadows Unit would prevent any potential compaction of soil caused by foot traffic.

2. Biological Considerations

a. Vegetation

Under this alternative, the Great Meadows Unit would remain closed to waterfowl hunting, thereby reducing low-level impacts (e.g., trampling or removal of vegetation) that may be associated with hunting activity. This alternative would not adversely impact vegetation.

b. Wildlife

Under this alternative, impacts such as the temporary displacement of wildlife species in the area immediately adjacent to hunting activity would not occur. Similarly, no disturbance to migratory and wintering waterfowl or threatened and endangered species is expected.

Under this alternative, harvest of local "resident" geese is prohibited which will result in higher numbers of local geese than under Alternatives that allow hunting. Large resident goose populations may damage agricultural crops and pose significant health and safety risks to people. Significant threats to aviation by Canada geese at airports include aircraft strikes, costly damages, and loss to human life (USFWS 2002). Harvest of resident geese at the Great Meadows

Unit may reduce the fecal coliform bacteria levels at swimming beaches and chances of goose and aircraft collisions at the adjacent Sikiorsky Memorial Airport.

3. Socioeconomic Considerations

This alternative will result in the loss of a traditional recreational hunting activity that occurred at this site prior to acquisition by the Service and the loss of a consumptive harvest of a renewable resource. Waterfowl hunting by water craft on most navigable waterways is permitted in Connecticut, although hunting by foot is limited.

Great Meadows Marsh is one of the few high quality saltmarshes in Connecticut that sportsmen can access by foot. If hunting is prohibited at Great Meadows Marsh, sportsmen who historically used the area would be negatively impacted.

This alternative may erode cooperation and support by consumptive users for future Refuge management activities. No adverse impact to non-consumptive recreational use is expected under this alternative, and wildlife viewing opportunities for the public would increase

- B. Alternative 2 – Proposed Action** – Open designated areas of the Great Meadows Unit, as indicated by a dotted line in Figure 14, to the hunting of waterfowl. Figure 14 illustrates the proposed waterfowl hunting area, 165 acres in size (dotted line), and currently open areas which has been estimated to exceed 438 acres. Under this alternative, waterfowl hunting would be permitted in designated areas only, under controlled conditions, and in accordance with State and Federal regulations. Hunt days would be limited to Tuesdays, Wednesdays, and Saturdays throughout the State established waterfowl hunting season. Hunters would be required to obtain a Special Use Permit from the Service. The Refuge will issue permits to hunt the designated hunting area of the Great Meadows Unit for the entire State waterfowl season. Hunter numbers will be limited according to state regulations for party size and distance between parties. In the future, hunter numbers could be limited by assigning permits to designated blinds or areas of the marsh to ensure a quality hunting experience. Controlled hunting conditions would be described in a Refuge Hunt Program may also include special regulations on hunting methods, bag limits, and/or fixed hunting season dates or lengths. Hunters may not erect permanent structures on nor remove vegetation from the Refuge. All other Units of Stewart B. McKinney National Wildlife Refuge and areas within the Great Meadows Unit would remain closed to hunting.

Stewart B. McKinney National Wildlife Refuge
Great Meadows Unit
Proposed Hunting Area

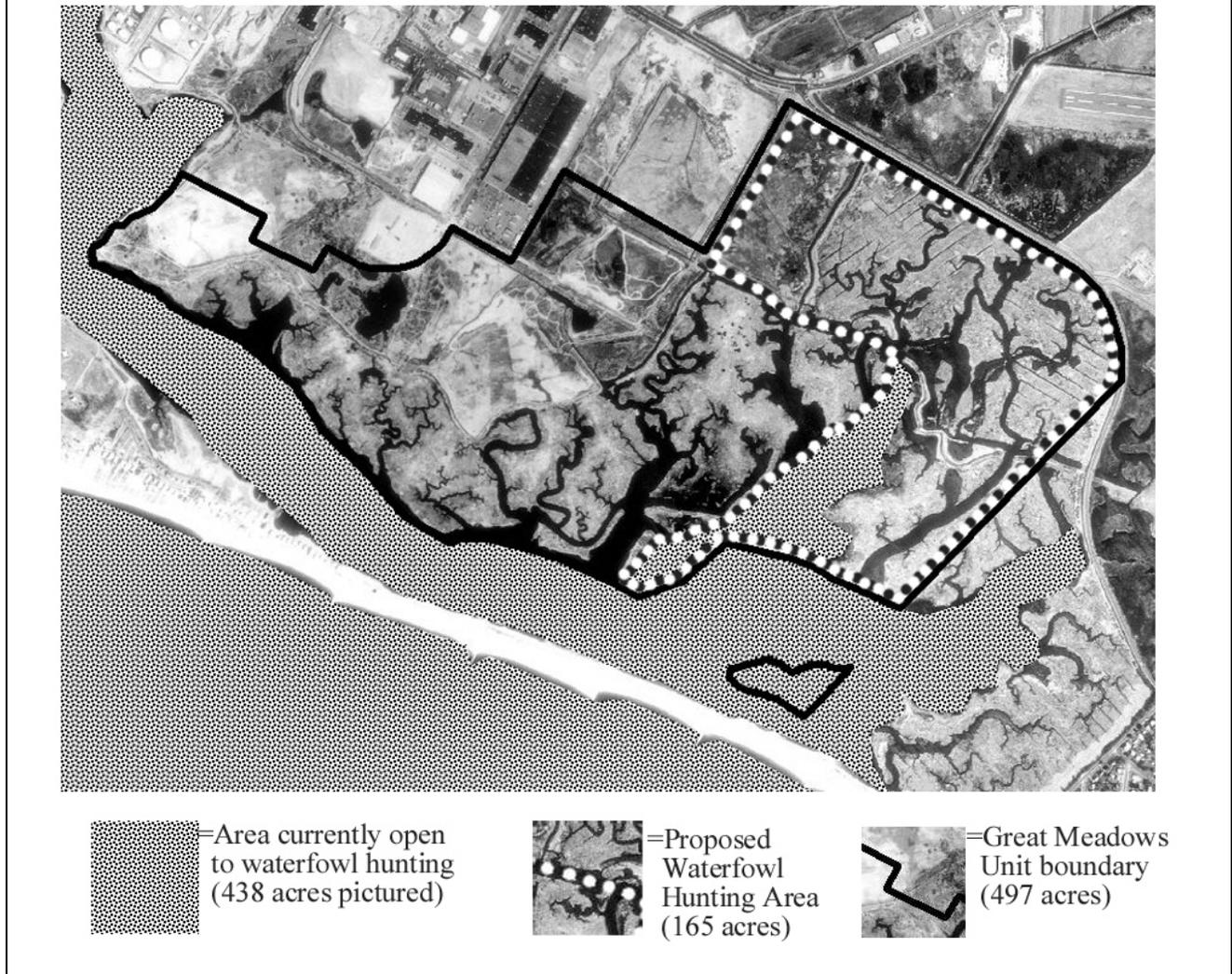


Figure 14. Detailed aerial view of the proposed designated waterfowl hunting area, 165 acres in size at the Great Meadows Unit of Stewart B. McKinney National Wildlife Refuge. Additional open hunting zones in the Stratford-Bridgeport area are not pictured here.

1. Physical Considerations

The proposed alternative would not significantly alter the physical characteristics of the proposed waterfowl hunting area. Foot traffic may result in low levels of soil compaction. Waterfowl hunting in Stratford occurred prior to acquisition by the Service and has had no measurable or visible effects on the physical characteristics of the property. Activities such as hunting camps and the installation of permanent hunting blinds will be prohibited, and therefore will not alter the physical character

of the proposed waterfowl hunting areas. Suitable parking areas are present on site; therefore construction of additional parking areas would not be required.

2. Biological Considerations

a. Vegetation

The proposed alternative would have a minimal effect on the vegetation of the proposed waterfowl hunting areas. Under this alternative, activities that negatively impact habitat would be prohibited, such as installing permanent hunting blinds or removing vegetation. While hunting activity may be accompanied by low-level impacts (e.g., trampling or removal of vegetation) in the area immediately adjacent to such activity, these disturbances are not expected to be permanent or long-lasting. Furthermore, the waterfowl hunting season occurs after the growing season and areas where paths develop would revegetate in the spring.

b. Wildlife

Under this alternative, there would be minimal impact to non-game wildlife species including shorebirds, marsh birds, and wading birds. Peak use by these species occurs prior to the hunting season. It is now recognized that even non-consumptive types of wildlife recreation can negatively impact wildlife by altering wildlife behavior, reproduction, distribution and habitat (Purdy et al. 1987, Knight and Cole 1995). To offset any negative impacts resulting from the competition of resources and habitat in time and space between hunters and wildlife, only designated hunting areas would be opened. Designated hunting areas would lessen the impact on these species while providing wildlife-dependent recreational opportunities to the public. The proposed hunting area was selected to provide a quality hunt to waterfowl hunters and refuge for harriers, migrating and wintering waterfowl, and other wildlife species. Designated hunt days would provide waterfowl with additional acreage for foraging and resting, and increase the number and diversity of waterfowl at the site.

While some disturbance of waterfowl using the Refuge during the fall and winter period would occur, this alternative is not expected to adversely impact total waterfowl populations. The Service establishes daily and seasonal bag limits (maximum number of individuals to be harvested) and season lengths by species prior to each hunting season using data from production areas. The proposed waterfowl hunting area is located within the Atlantic Flyway - one of the four migration corridors recognized in the United States. Managing waterfowl populations at the Flyway level provides for the regional protection of these migratory species. Waterfowl hunting would be conducted during State established seasons, which usually closes in late January or February, the most critical period of winter.

There would be no impact to total waterfowl populations because the harvest is adequately regulated by the Service at the Flyway level using data collected from production areas. However, hunting directly impacts individuals by causing mortality, wounding, and disturbance. A study conducted in Denmark found hunting to affect diversity and number of birds using a site (Madsen 1995). Species diversity may therefore decrease while hunting is conducted. Large numbers of waterfowl may migrate elsewhere in response to continued and extensive disturbance. (Madsen 1995, Paulus 1984). Restricting the number of hunt days per season to Tuesdays, Wednesdays, and Saturdays may minimize disturbance to waterfowl but should be properly managed to prevent confusion among hunters.

Under the proposed alternative, there would be no significant impact to federally endangered or threatened species. Piping plovers, which nest and feed in areas adjacent to Great Meadows Marsh from March through July, migrate to southern wintering areas prior to the hunting season. Northern harriers are state endangered and a federal non-game species of management concern. Although the State waterfowl hunting season usually ends prior to establishment of territories used when breeding, continued disturbance of wintering harriers may discourage nesting on the Refuge.

Connecticut hosts northern harriers year round, but it is not known whether breeding individuals remain at the Great Meadows Unit throughout the winter. In a study conducted in Idaho during the breeding season, military training involving firing of small arms and other artillery lowered raptor counts and northern harrier prey capture attempts (Schueck et al. 2001). Ground training activities during the breeding season caused raptors to shift or expand home ranges (Andersen et al. 1990) and displaced birds from or disrupted behavior in preferred foraging areas. As cited by Shueck (2001), these disturbances may lower hunting success, increase intraspecific encounters, and reduced food intake (Andersen 1984). If breeding harriers remain at the Great Meadows Unit throughout the year, small arms firing during winter may discourage breeding. The designated hunting area in Figure 11 and the designated hunt days will negate this potential impact to breeding by providing displaced harriers with foraging areas closed to human recreation.

Under this alternative, migrating and wintering northern harriers, bald eagles, and peregrine falcons displaced from the designated area may use other areas of the Unit for feeding and resting. No known rare, threatened, or endangered plant species exist in the proposed area. The Refuge may close individual areas within the proposed waterfowl hunting area boundaries to accommodate shifts in plant colonization or use by wildlife communities.

This proposed alternative would continue to allow harvest of “resident” Canada geese. Regulated harvest was used as a management tool used to control this

local nuisance goose population prior to Service ownership. A smaller number of resident geese will be present at the Great Meadows Unit under Alternative 2 than Alternative 1. Harvesting will help control resident geese and reduce the potential for damage to agricultural crops, increased fecal coliform counts at swimming beaches, and aircraft collisions at the adjacent Sikorsky Memorial Airport.

3. Socioeconomic Considerations

This proposed alternative would allow a traditional recreational activity to continue and fulfill a Refuge mission of providing opportunities for wildlife-oriented recreation while maintaining the integrity of wildlife habitat. Providing waterfowl hunting opportunities will foster cooperation and support for future Refuge management activities by consumptive users. All waters surrounding the Great Meadows Unit are currently open to waterfowl hunting, including the Long Island Sound, Lewis Gut, and the nearby Charles E. Wheeler marsh. The Refuge is proposing to open 165 acres to waterfowl hunting in addition to the currently open areas which exceed the 438 acres pictured in Figure 11. Additional hunting opportunities exist adjacent to the Great Meadows Unit, such as the water bodies of Lewis Gut, the Long Island Sound, and the Charles E. Wheeler Marsh. Under this alternative, a small increase in revenues derived from the sale of licenses and migratory bird conservation stamps, as well as related revenues, may occur.

The proposed alternative would not compromise public safety, and would not limit the other recreational use of the GMU by the public. Areas designated as open to waterfowl hunting would be located away from any public visitor areas. In the state of Connecticut, a hunting party shall include no more than six individuals, with a minimum distance of 100 yards between parties. Shooting toward any person, building or domestic animal within range is strictly prohibited. All State waterfowl hunting regulations would be enforced and are listed in Appendix A. The proposed public access trail and the designated waterfowl hunting area do not overlap, allowing multiple wildlife related uses of the Refuge by the public to occur simultaneously. While the proposed hunting activity does not pose a public safety concern, some members of the public have indicated they would not visit the refuge during hunt days. Limiting hunting to 3 days per week will provide ample hunt-free days and increase waterfowl viewing opportunities at the site. Opening the designated area within the GMU will provide a safe and enjoyable experience to all members of the public.

The previous landowner issued 80 permits each year to hunters which equates to 800 hunter-days of recreation (based on a national average of 10 hunting days/hunter/year USFWS 2001). State regulations specify that a hunting party shall include no more than six individuals with a minimum distance of 100 yards (approximately 300 feet) between parties, thus limiting hunting activity. By requiring access permits, the Service can gauge hunter use on the property. Although the proposed waterfowl hunting area is approximately 165 acres in size,

capable of supporting a maximum of 22 parties with 6 people in each party (990 hunter-days of recreation), parties would be limited by available parking spaces.

Opening the designated area to waterfowl hunting would increase enforcement needs of the Refuge due an increase in the amount of area to be patrolled. It would require an initial commitment of staff to post areas open to hunting. Annual operations and maintenance costs would increase slightly to cover the placement of additional signs and Refuge enforcement of waterfowl regulations.

- C. Alternative III** –Open the entire Great Meadows Unit to the hunting of waterfowl. Under this alternative, all areas within the Great Meadows Unit would be opened to waterfowl hunting, conducted under controlled conditions, and in accordance with State and Federal regulations. Hunters would be required to obtain a Special Use Permit from the Service. The Refuge will issue permits to hunt the designated hunting area of the Great Meadows Unit for the entire state waterfowl season. Hunter numbers will be limited according to state regulations for party size and distance between parties. In the future, hunter numbers could be limited by assigning permits to designated blinds or areas of the marsh to ensure a quality hunting experience. Controlled hunting conditions would be described in a Refuge Hunt Program may also include special regulations on hunting methods, bag limits, and/or fixed hunting season dates or lengths. Hunters may not erect permanent structures on nor remove vegetation from the Refuge. All other Units of Stewart B. McKinney National Wildlife Refuge and areas within the Great Meadows Unit would remain closed to hunting.

1. Physical Considerations

Impacts to physical resources would be the same or greater as described under Alternative II. Hunters would not be restricted to designated areas; therefore, monitoring impacts would be difficult due to the unpredictable disbursement of use.

2. Biological Considerations

a. Vegetation

Impacts to vegetation would essentially be the same or possibly greater than as described under Alternative 1. Under this alternative, no permanent impact on habitat would be expected. The low level impacts accompanied by hunting (e.g., trampling or removal of vegetation) would be spread throughout the Unit, making monitoring of impacts more difficult.

b. Wildlife

The disturbance created from waterfowl hunting in the entire Great Meadows Unit may temporarily displace wintering or migrating wildlife into adjacent, less suitable areas, resulting in a greater expenditure of energy by wildlife and diminished use of the Refuge as habitat for wildlife.

Under this alternative, there would be an impact on some federal and/or State endangered or threatened species. Hunting the entire GMU may temporarily displace migrating and wintering northern harriers, bald eagles, and peregrine falcons into less suitable areas. Although foot traffic through areas known to support the State rare, threatened, or endangered plants such as the marsh pink and the coast violet will be prohibited, unmapped or newly colonized sites may be trampled.

Unlimited hunting access to the Refuge by foot could have a noticeable effect on the number of waterfowl using the Refuge during the migration and wintering seasons. Although the number of hunters that walk onto the site would be limited by available parking, walking would also be permitted to hunters who boat onto the site. Opening the entire Great Meadows Unit to hunting could cause most waterfowl to abandon the Refuge during hunting season, reducing the quality of the recreational experience to all users.

There would be no impact to total waterfowl populations because the harvest is adequately regulated by the Service at the Flyway level using data collected from production areas. However, hunting directly impacts individuals by causing mortality, wounding, and disturbance. A study conducted in Denmark found hunting to affect diversity and number of birds using a site (Madsen 1995). Species diversity may therefore decrease while hunting is conducted. Large numbers of waterfowl may migrate elsewhere in response to continued and extensive disturbance. (Madsen 1995, Paulus 1984). Restricting the number of hunt days per season may minimize disturbance to waterfowl but should be properly managed to prevent confusion among hunters.

This proposed alternative would continue to allow harvest of “resident” Canada geese. Regulated harvest was used as a management tool used to control this local nuisance goose population prior to Service ownership. Harvesting will help control resident geese and reduce the potential for damage to agricultural crops, increased fecal coliform counts at swimming beaches, and aircraft collisions at the adjacent Sikorsky Memorial Airport.

3. Socioeconomic Considerations

Alternative III may generate a slight increase in revenue of local and state economies from the sale of licenses, migratory bird conservation stamps, and patronization of local businesses. A well-managed waterfowl hunting program may foster support and cooperation for future Refuge management activities.

This alternative would not compromise public safety, but would limit the recreational use of the GMU by multiple user groups of public. The proposed public access trail and the designated waterfowl hunting area overlap, limiting public use of the Refuge. Opening the entire GMU to hunting may diminish the

quality of the hunting experience. State regulations specify hunting party size and minimum distances between hunting parties, set minimum shooting distances from buildings, and prohibit shooting toward any person, building or domestic animal within range.

Opening all areas to waterfowl hunting would increase enforcement needs due to an increase in the amount of area to be patrolled. Although the 492 acres of the Great Meadows Unit could support 35 parties (1,575 hunter-days of recreation per year), the number of parties able would be limited to available parking spaces and Refuge law enforcement staff.

VI. CUMULATIVE IMPACTS

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

1. Migratory Birds

a. Alternative 1

This no action alternative would not impact migratory birds.

b. Alternative 2

The Service annually prescribes frameworks, or outer limits, for dates and times when hunting may occur and the number of birds that may be taken and possessed. These frameworks are necessary to allow State selections of season and 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 these 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 U.S. Fish and Wildlife 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. The Stewart B. McKinney National Wildlife Refuge 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 environmental assessment

developed when a National Wildlife Refuge opens a new hunting activity, season dates and bag limits may be more restrictive than the State allows. At the Refuge the GMU is only open 3 days a week for hunting during the waterfowl season.

National Environmental Policy Act (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 Environmental Protection Agency on June 9, 1988. The Service published Notice of Availability in the Federal Register on June 16, 1988 (53 FR 22582), and the Record of Decision on August 18, 1988 (53 FR 31341). Annual NEPA considerations for waterfowl hunting frameworks are covered under a separate Environmental Assessment, “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, D.C., 20240.

During the 2005-2006 hunting season on the Refuge, 165 acres were open and utilized by Waterfowl hunters. Refuge staff recorded 20 active hunters during the season and who hunted 64 days, an average of 3 trips per hunter per year. This is well below the average of the State of Connecticut’s 7.5 hunting days per hunter per year (USDOJ 1996). The Refuge hunt was limited to Tuesdays, Wednesdays, and Saturdays of the state established season, the Refuge was only open to hunting 56 days during the 2006 season. Due to State law, the maximum number of hunting parties which the 165 acres could accommodate would be 22 parties with no more than 6 individuals to a party. The maximum number of hunters in the hunting zone would be no more than 132 hunters on a single day. Historic use of this area indicates numbers well below this maximum allowable number of hunters. The cumulative effects of allowing hunting on the 165 acres of the GMU on active hunters and hunter days are shown in Figure 15. The cumulative effects of allowing hunting on the Refuge on species harvested are indicated in Figure 16. This level of waterfowl hunting is expected to decrease as the number of people pursuing shooting sports continues to decline. Between 1999 and 2005 the numbers of active waterfowl hunters in the State of Connecticut have fallen by 1,200 hunters (USFWS Harvest Information Program). The number of days of active duck hunting has fallen by 11,700 days in Connecticut and by 1,078,600 days in the Atlantic Fly during the same time period.

Hunting Pressure	Active Duck Hunters	Active Hunter Days
Atlantic Flyway	187,400	1,067,300
State of Connecticut	3,000	20,700
Refuge	20	64
Effects to Atlantic Flyway	Increase of 0.01 percent	Increase 0.006 percent
Effects to State of Connecticut	Increase of 0.67 percent	Increase 0.31 percent

Figure 15. Effects on Hunting Pressures. Source: USFWS Harvest Information Program 2005. USFWS Refuge Hunting Permit System 2006.

Species Harvested	Harvested Atlantic Flyway	Harvested State of Connecticut	Harvested Refuge	Effects to Atlantic Flyway	Effects to State of Connecticut
Mallards	444,300	13,900	17	Increase of 0.004 percent	Increase of 0.12 percent
Black Ducks	93,400	3,800	31	Increase of 0.03 percent	Increase of 0.86 percent
Gadwall	34,300	300	6	Increase of 0.02 percent	Increase of 0.18 percent
Wigeon	20,700	100	9	Increase of 0.04 percent	Increase of 9.0 percent
Bufflehead	55,900	500	1	Increase of 0.002 percent	Increase of 0.2 percent
Hooded Merganser	34,000	100	1	Increase of 0.003 percent	Increase of 1 percent
Canada Goose	774,500	29,900	71	Increase of 0.009 percent	Increase of 0.34 percent

Figure 16. Effects on Species Harvested. Source: USFWS Harvest Information Program 2005. USFWS Refuge Hunting Permit System 2006.

c. Alternative 3

Alternative 3 would open approximately 373 acres within the GMU to waterfowl hunting. Of the total 421 Refuge owned acres at Great Meadows, 42 acres of newly restored wetlands and 48 acres of uplands would not be hunted. As stated in the analysis for Alternative 2, duck hunting participation is declining. The Refuge does not anticipate larger numbers of people engaged in hunting activities under this Alternative, but rather a dispersal of hunters throughout 373 acres appropriate for waterfowl hunting. As stated in

Alternative 2, individual waterfowl within the population would be harvested. It would not be expected to adversely impact total waterfowl populations within the flyway or continent.

Summary Statement: Although individuals within the population would be harvested, Alternatives 2 and 3 are not expected to adversely impact total waterfowl populations. The State of Connecticut in consultation with the Service establishes daily and seasonal bag limits and season lengths by species prior to each hunting season using data from the protection areas. The Service and State of Connecticut regulate waterfowl harvest to ensure no long term impact on the population. Alternative 1, the no action alternative, would not impact migratory birds.

2. Non-hunted Wildlife

a. Alternative 1

This no action alternative would not impact non-hunted wildlife.

b. Alternative 2

Non-hunted wildlife would include non-hunted migratory birds such as songbirds, wading birds, raptors, and woodpeckers; mammals such as deer, fox, raccoon, voles, moles, mice, and shrews; reptiles and amphibians such as snakes, skinks, turtles, lizards, salamanders, frogs and toads; and invertebrates such as butterflies, moths, other insects and spiders. Except for migratory birds and some species of migratory butterflies and moths, these species have very limited home ranges and hunting could not affect their populations regionally; thus, only local effects will be discussed.

Disturbance to non-hunted migratory birds could have regional, local, and flyway effects. Regional and flyway effects would not be applicable to species that do not migrate such as most woodpeckers, and some songbirds including cardinals, titmice, wrens, chickadees, etc. The cumulative effects of disturbance to non-hunted migratory birds under the proposed action are expected to be negligible for the following reasons. Hunting season would not coincide with the nesting season. Long-term future impacts that could occur if reproduction was reduced by hunting are not relevant for this reason. Disturbance to the daily wintering activities, such as feeding and resting, of birds might occur. Disturbance to birds by hunters would probably be commensurate with that caused by non-consumptive users.

The most likely negative cumulative impact to non-hunted wildlife (mammals) would be disturbance. However, disturbance would be unlikely for the following reasons. Some small mammals are inactive or less active during winter when hunting season occurs. Many small mammals are also nocturnal. Both of these qualities make hunter interactions with small mammals extremely rare. Larger mammals may be temporarily displaced during hunting activity. Hibernation or torpor by cold-blooded reptiles and amphibians also limits their activity during the hunting cooler season. Hunters will rarely encounter reptiles

and amphibians during most of the hunting season. Encounters with reptiles and amphibians in the early fall are few and should not have a negative effect on reptile and amphibian populations. Invertebrates are also not as active during cold weather and will have few interactions with hunters during the hunting season.

Due to State law, the maximum number of hunting parties which the 165 acres could accommodate would be 22 parties with no more than 6 individuals to a party. The maximum number of hunters in the hunting zone would be no more than 132 hunters on a single day. Historic use of this area indicates numbers well below this maximum allowable number of hunters. Refuge regulations further mitigate possible disturbance by hunters to non-hunted wildlife. The harassment or taking of other wildlife other than waterfowl is illegal.

Although ingestion of lead-shot by non-hunted wildlife would have a negative cumulative impact, it is not relevant to Stewart B. McKinney National Wildlife Refuge because the use of lead shot is not permitted on the Refuge for waterfowl hunting.

Some species of butterflies and moths are migratory. Cumulative effects to these species at the “flyway” level should be negligible. These species are in torpor or have completely passed through Connecticut by peak hunting season in January, February, and November. Some hunting occurs during September and October when these species are migrating; however, hunter interaction would be commensurate with that of non-consumptive users.

c. Alternative 3

Alternative 3 would open approximately 373 acres within the GMU to waterfowl hunting. Of the total 421 Refuge owned acres at Great Meadows, 42 acres of newly restored wetlands and 48 acres of uplands would not be hunted. Duck hunting participation in Connecticut is expected to continue to decline. Between 1999 and 2005 the numbers of active waterfowl hunters in the State of Connecticut have fallen by 1,200 hunters (USFWS Harvest Information Program). The Refuge does not anticipate larger numbers of people engaged in hunting activities under this Alternative, but rather a dispersal of hunters throughout 373 acres appropriate for waterfowl hunting. There would be minimum long-term impacts on non-hunted wildlife species due to the timing and structure of the hunting activity and the natural history of the animals involved.

Summary Statement: There would be minimal long-term impacts on non-hunted wildlife species under Alternative 2 due to timing and structure of the hunting activity and the natural history of the animals involved.

3. Endangered, Threatened and Special Concern Species

a. Alternative 1

This no action alternative would not impact species listed as endangered, threatened, or species of special concern.

b. Alternative 2

The federally threatened species that utilize the Refuge included the piping plover (*Charadrius melodus*) and bald eagles (*Haliaeetus Leucocephalus*). A Section 7 Evaluation was conducted in association with this assessment to allow 165 acres to be open for hunting anywhere on the GMU as determined by administrative, public use, and biological reason. It was determined that the proposed alternative would not likely adversely affect these endangered species.

The CT DEP, Wildlife Division has documented piping plover (*Charadrius melodus*) nesting activity at Long Beach in Stratford and Pleasure Beach in Bridgeport since 1984. Long Beach and Pleasure Beach are adjacent to the GMU, separated from the GMU by the Lewis Gut embayment. Approximately four pairs of federally threatened piping plover successfully nested during the 2002 breeding season at Long Beach. Piping plovers have not been documented on the Refuge in the past five years, although occasional use of the GMU during the breeding season or migration for foraging may occur. Piping plovers typically arrive in Connecticut in late March (CT DEP 1992) and migrate to wintering grounds from July to September (USFWS 1996). The proposed hunting program would take place after fall migration and end prior to spring migration. In the event both piping plovers and hunters are simultaneously present in the GMU vicinity, disturbance would be minimal. Piping plover nesting habitat does not exist on the GMU and it is unlikely a plover would be accidentally shot by waterfowl hunters. Due to site fidelity of piping plovers (Erlich et al 1988), nesting will most likely continue to occur. While piping plovers have not been observed at the GMU, Refuge surveys regularly record piping plovers feeding along the Lewis Gut shores of Long Beach and Pleasure Beach, at a distance as little as 400 feet from the GMU.

Occurrence of bald eagles (*Haliaeetus leucocephalus*) at the GMU has been documented as “accidental” on the Refuge Bird List and the Environmental Review Team Report, “Long Beach, Stratford, Connecticut”, prepared by King Mark’s Resource Conservation and Development Area, Inc. in 1987. According to Refuge and CT DEP Natural Heritage data, no other species protected by the Endangered Species Act of 1973 have been documented at the GMU.

Only designated areas of the GMU will be open to waterfowl hunting. Refuge staff would continue to monitor the Refuge for wildlife, including piping plovers, and any apparent impacts of the waterfowl hunting program. Refuge staff would also conduct regular law enforcement patrols to ensure hunters are abiding by established State and Federal regulations.

State endangered species such as the peregrine falcon and sharp-shinned hawk are occasionally seen at the GMU. The GMU serves as a possible short-eared

owl (state threatened) wintering roost. The peregrine falcon, red-shouldered hawk, and short-eared owl are listed on the 1995 U.S. Fish and Wildlife Service Non-game Species of Management Concern in the northeast region, Region 5 (USFWS 1995).

The GMU provides foraging for the state threatened least tern which breeds on the adjacent Long Beach. State endangered, threatened, and/or special concern species which have been sighted and potentially breed on the Refuge include the salt marsh sharp-tailed, seaside, and savannah sparrow, the horned lark, northern harrier, and pied-billed grebe (Bevier 1994), all of which are marsh or grassland obligates. In addition to breeding, the northern harrier and pied-billed grebe also overwinter at GMU (Schneider and Pence 1992). Although harriers are highly visible species when hunting, nests are cryptically located directly on the ground or less than five feet above the ground in hummock or in thick vegetation (Erlich et al 1988, Andrle and Carroll 1988). Harriers arrive on breeding grounds in the Northeast from mid-March to early April and lay eggs from mid-April to mid and late June (Schneider and Pence 1992). The Refuge limits public use during the nest site establishment period and prohibits public access to the nesting area until fledging. Any winter roosting sites of the harrier will also be closed to the public.

The state endangered plants the coast violet (*Viola brittoniana*) and marsh pink (*Sabatia stellaris*), occur in the GMU. These species are located in closed areas of the Refuge where access is prohibited year round.

c. Alternative 3

Alternative 3 would open approximately 373 acres within the GMU to waterfowl hunting. Of the total 421 Refuge owned acres at Great Meadows, 42 acres of newly restored wetlands and 48 acres of uplands would not be hunted. Duck hunting participation in Connecticut is expected to continue to decline. Between 1999 and 2005 the numbers of active waterfowl hunters in the State of Connecticut have fallen by 1,200 hunters (USFWS Harvest Information Program). The Refuge does not anticipate larger numbers of people engaged in hunting activities under this Alternative, but rather a dispersal of hunters throughout 373 acres appropriate for waterfowl hunting. Bald eagle and piping plover habitat does not exist on the GMU and either species may only occasionally use Refuge lands. The alternative would not impact piping plovers, bald eagles, or other listed species due to the structure of the hunt program. Hunters would not be present at the Great Meadows Unit during the migratory and breeding season of piping plovers. A limited hunt (3 days per week) would provide days without hunting disturbance to bald eagles during migration (January and February).

Summary Statement: The proposed alternative would not likely adversely impact any piping plover or bald eagles as determined through Section 7 consultation. Other

species of special concern would not likely be affected due to the structure of the hunting program.

B. Anticipated Direct and Indirect impacts of proposed action on Refuge Programs, Facilities, and Cultural Resources.

1. Wildlife-Dependent Recreation

a. Alternative 1

Alternative 1 would directly affect the ability of the Refuge to offer waterfowl hunting opportunities which are defined by the National Wildlife Refuge System Improvement Act of 1997 as a priority public use on National Wildlife Refuges.

b. Alternative 2

As public use levels of other recreational activities expand across time, unanticipated conflicts between user groups may occur. The Refuge's visitor use programs would be adjusted as needed to eliminate or minimize each problem and provide quality wildlife-dependent recreational opportunities. Experience has proven that time and space zoning (e.g., establishment of separate use areas, use periods, and restrictions on the number of users) is an effective tool in eliminating conflicts between user groups. The proposed alternative would not compromise public safety, and would not limit the other recreational use of the GMU by the public. All areas of the Great Meadows are currently closed to the public unless a Special Use Permit has been approved. The Refuge is in the process of opening an interpretive trail with viewing platforms at the Great Meadows Unit which will facilitate the only anticipated wildlife dependent recreation of wildlife observation, education, interpretation, and photography. Areas designated as open to waterfowl hunting would be located away from any public visitor areas. While the proposed hunting activity does not pose a public safety concern, some members of the public have indicated they would not visit the Refuge during hunt days. Limiting hunting to 3 days per week will provide ample hunt-free days and increase waterfowl viewing opportunities at the site. Opening the proposed designated area within the GMU on designated days will provide visitors with a safe experience and help to make it enjoyable. The proposed action allows Refuge staff to readjust the hunting zone if public use problems arise.

The level of recreation use and ground-based disturbance from visitors would be largely concentrated at the GWU trail and parking lot. This, combined with other non-consumptive uses, would have a negative effect on nesting bird populations that affect other wildlife dependent activities. However, the hunting season is during the winter and not during most birds' nesting period. It is unlikely that bald eagles would establish nests near developed facilities or during the hunting season. Refuge staff would control access under this alternative to minimize wildlife disturbance and habitat degradation, while allowing current and proposed compatible wildlife-dependent recreation.

c. Alternative 3

Alternative 3 would open approximately 373 acres within the GMU to waterfowl hunting. Of the total 421 Refuge owned acres at Great Meadows, 42 acres of newly restored wetlands and 48 acres of uplands would not be hunted. Duck hunting participation in Connecticut is expected to continue to decline. Between 1999 and 2005 the numbers of active waterfowl hunters in the State of Connecticut have fallen by 1,200 hunters (USFWS Harvest Information Program). The Refuge does not anticipate larger numbers of people engaged in hunting activities under this Alternative, but rather a dispersal of hunters throughout 373 acres appropriate for waterfowl hunting. Dispersed hunters under this Alternative are not expected to affect the quality of waterfowl hunt or the quality and quantity of other public uses at the GMU.

Summary Statement: Minimal long-term impacts due to user conflicts may occur under Alternative 2, however, hunting zones would only be located in the tidal marsh area which is removed from other sites of public use located in the upland areas.

2. Refuge Facilities

a. Alternative 1

This no action alternative would not affect Refuge facilities.

b. Alternative 2

The Service defines facilities as: “Real property that serves a particular function(s) such as buildings, roads, utilities, water control structures, raceways, etc.” Under the proposed action those facilities most utilized by hunters would be GMU parking lots and trails. Maintenance or improvement of existing facilities would cause minimal short term impacts to localized soils and waters and may cause some wildlife disturbances and damage to vegetation. The facility maintenance and improvement activities described are periodically conducted to accommodate public uses such as wildlife observation and photography. These activities will be conducted at times (seasonal and/or daily) to cause the least amount of disturbance to wildlife. Siltation barriers will be used to minimize soil erosion, and all disturbed sites will be restored to as natural a condition as possible.

c. Alternative 3

Alternative 3 would open approximately 373 acres within the GMU to waterfowl hunting. Of the total 421 Refuge owned acres at Great Meadows, 42 acres of newly restored wetlands and 48 acres of uplands would not be hunted. Duck hunting participation in Connecticut is expected to continue to decline. Between 1999 and 2005 the numbers of active waterfowl hunters in the State of Connecticut have fallen by 1,200 hunters (USFWS Harvest Information Program). The Refuge does not anticipate larger numbers of people engaged in hunting activities under this Alternative, but rather a dispersal of hunters throughout 373 acres appropriate for waterfowl hunting. Because the Refuge

does not anticipate larger numbers of hunters, this Alternative would not impact Refuge facilities.

Summary Statement: Alternative 2 would incur minimal long-term impacts on Refuge facilities. The anticipated hunting use on Refuge facilities would not increase the amount of maintenance activity currently being provided to the trail and parking lot which is currently being provided to support other public uses.

3. Cultural Resources

a. Alternative 1

This no action alternative would not affect cultural resources.

b. Alternative 2

Waterfowl hunting on GMU is a consumptive activity that does not pose any threat to historic properties on and/or near the Refuge. In fact, hunting meets only one of the two criteria used to identify an “undertaking” that triggers a federal agency’s need to comply with Section 106 of the National Historic Preservation Act. These criteria, which are delineated in 36 CFR Part 800, state:

1- an undertaking is any project, activity, or program that can alter the character or use of an archaeological or historic site located within the “area of potential effect;” ; and

2- the project, activity, or program must also be either funded, sponsored, performed, licenses, or have received assistance from the agency.

Consultation with the pertinent State Historic Preservation Office and federally recognized Tribes are, therefore, not required.

c. Alternative 3

Alternative 3 would open approximately 373 acres within the GMU to waterfowl hunting. Of the total 421 Refuge owned acres at Great Meadows, 42 acres of newly restored wetlands and 48 acres of uplands would not be hunted. Duck hunting participation in Connecticut is expected to continue to decline. Between 1999 and 2005 the numbers of active waterfowl hunters in the State of Connecticut have fallen by 1,200 hunters (USFWS Harvest Information Program). The Refuge does not anticipate larger numbers of people engaged in hunting activities under this Alternative, but rather a dispersal of hunters throughout 373 acres appropriate for waterfowl hunting. Hunting activities would not impact known cultural resources on or adjacent to the Great Meadows Unit.

Summary Statement: Hunting activities would not impact known cultural resources on or adjacent to GMU land.

4. Anticipated Impacts of Proposed Hunt on Refuge Environment and Community

a. Alternative 1

This no action alternative would not affect the Refuge environment or community.

b. Alternative 2

Refuge staff expects minimal adverse impacts of the proposed action on the Refuge environment which consists of soils, vegetation, air quality, water quality. Some disturbance to surface soils and vegetation would occur in areas selected for hunting; however impacts would be minimal. The Refuge would also control access to minimize habitat degradation.

Refuge staff expects impacts to air and water quality to be minimal and only due to Refuge visitors' automobile (to travel to the GMU) and boat emissions and run-off on trail sides. The effect of these refuge-related activities, as well as other management activities, on overall air and water quality in the region are anticipated to be relatively negligible, compared to the contributions of industrial centers, power plants, and non-refuge vehicle traffic. Existing State water quality criteria and use classifications are adequate to achieve desired on-refuge conditions; thus, implementation of the proposed action would not impact adjacent landowners or users beyond the constraints already implemented under existing State standards and laws.

Refuge staff would work closely with State, Federal, and private partners to minimize impacts to adjacent lands and its associated natural resources; however, no indirect or direct impacts are anticipated. Water fowl hunting may cause, a small increase in revenues derived from the sale of licenses and migratory bird conservation stamps, as well as related spending in the area as hunter pursue their sport.

The GMU's neighboring land use's include the Sikorsky Memorial Airport, light industrial park complex, residential community, and recreational motor boating. Additional noise created by the proposed action would have only a minimal short-term impact upon the discharge of the firearm.

c. Alternative 3

Alternative 3 would open approximately 373 acres within the GMU to waterfowl hunting. Of the total 421 Refuge owned acres at Great Meadows, 42 acres of newly restored wetlands and 48 acres of uplands would not be hunted. Duck hunting participation in Connecticut is expected to continue to decline. Between 1999 and 2005 the numbers of active waterfowl hunters in the State of Connecticut have fallen by 1,200 hunters (USFWS Harvest Information Program). The Refuge does not anticipate larger numbers of people engaged in hunting activities under this Alternative, but rather a dispersal of hunters throughout 373 acres appropriate for waterfowl hunting. Impacts would be similar to Alternative 2 as stated above.

Summary Statement: There would be minimal long-term impacts on soils, vegetation, air quality, and water quality under Alternatives 2 and 3. Vegetation and soils would be slightly disturbed as hunters move between parking area and hunting zone(hunters are required to follow certain routes to access hunting zones to minimize potential impacts to vegetation, soil and water quality) as well as retrieving downed birds. Because of the current land uses in the surround area there would be minimal impact on the feeling of solitude within GMU caused by hunting activity.

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

a. Alternative 1

This no action alternative would not affect past, present, and reasonably foreseeable hunts.

b. Alternative 2

Cumulative effects on the environment result from incremental effects of a proposed action when these are added to other past, present, and reasonably foreseeable future actions. While cumulative effects may result from individually minor actions, they may, viewed as a whole, become substantial over time. The proposed hunt plan has been designed so as to be sustainable through time given relatively stable conditions and the ability to adapt to future administrative, public use or biological changes. Changes in Refuge conditions, such as sizeable increases in Refuge acreage or public use, are likely to change the anticipated impacts of the current plan and would trigger a new hunt planning and assessment process. At this time, there are no plans to increase the size of the area available for waterfowl hunting or allow the hunting of any other species. However, should the Refuge contemplates opening additional areas to hunting activity or the hunting of different species, the Refuge would consider the cumulative impact of all refuge hunts at that time.

The implementation of this proposed action would have both direct and indirect effects (e.g., in increased public use, thus increasing vehicular traffic, disturbance, etc); however, the cumulative effects of these actions are not expected to be substantial.

c. Alternative 3

Alternative 3 would open approximately 373 acres within the GMU to waterfowl hunting. Of the total 421 Refuge owned acres at Great Meadows, 42 acres of newly restored wetlands and 48 acres of uplands would not be hunted. Duck hunting participation in Connecticut is expected to continue to decline. Between 1999 and 2005 the numbers of active waterfowl hunters in the State of Connecticut have fallen by 1,200 hunters (USFWS Harvest Information Program). The Refuge does not anticipate larger numbers of people engaged in hunting activities under this Alternative, but rather a dispersal of hunters throughout 373 acres appropriate for waterfowl hunting. Impacts would be similar to Alternative 2 as stated above.

6. Anticipated Impacts if Individual Hunts are Allowed to Accumulate
 - a. Alternative 1
No impacts are anticipated under this no action alternative.
 - b. Alternative 2
National Wildlife Refuges, including Stewart B. McKinney NWR, conduct hunting programs within the framework of State and Federal regulations. By maintaining hunting regulations that are as, or more, restrictive than the State, individual refuges ensure that they are maintaining seasons which are supportive of management on a more regional basis. The proposed hunt plan has been reviewed and is supported by the CT DEP. At this time the only hunt allowed at the GMU is waterfowl hunting.
 - c. Alternative 3
Alternative 3 would open approximately 373 acres within the GMU to waterfowl hunting. Of the total 421 Refuge owned acres at Great Meadows, 42 acres of newly restored wetlands and 48 acres of uplands would not be hunted. Duck hunting participation in Connecticut is expected to continue to decline. Between 1999 and 2005 the numbers of active waterfowl hunters in the State of Connecticut have fallen by 1,200 hunters (USFWS Harvest Information Program). The Refuge does not anticipate larger numbers of people engaged in hunting activities under this Alternative, but rather a dispersal of hunters throughout 373 acres appropriate for waterfowl hunting. Impacts would be similar to Alternative 2 as stated above.

VII. CONSULTATION AND COORDINATION WITH OTHERS

During the preparation of this draft Environmental Assessment, State biologists with expertise and experience in the research and management of waterfowl populations were consulted. The draft document was written by the cooperative efforts of State biologists and staff from Stewart B. McKinney National Wildlife Refuge and Ninnigret National Wildlife Refuge.

The US Fish and Wildlife Service hosted a public meeting on January 6, 2005, from 5:00 PM to 9:00 PM to gather comments regarding the proposal to allow waterfowl hunting at the Great Meadows Unit of Stewart B. McKinney National Wildlife Refuge (Refuge) in Stratford, Connecticut. A News Release was sent on January 20, and the CT Post, The Hour, the Stratford Bard, and the New Haven Register printed announcements or articles before the meeting.

Cindy Coughenour, Assistant Refuge Manager, and Sara Williams, Wildlife Biologist outlined the Alternatives, answered questions, and encouraged discussion concerning the alternatives with members of the public in an informal, open house setting in the Town of Stratford Council Chambers. Members of the public viewed maps of the area and the Proposed Alternative which includes a 165 designated waterfowl hunting area, and provided both written and verbal comments.

In attendance at the January 6, 2005 meeting were at least 34 individuals (31 people gave their names on an optional sign-in sheet, 26 people provided written comments, and 2 news media attended the event). According to the written comments, 4 people were in support of Alternative I (no hunting), 6 people supported Alternative II (hunting in designated area only), and 13 people supported Alternative III (hunting throughout the Great Meadows Unit). Four others supported hunting in general.

The revised 2004 EA is titled “Proposal to Establish and Conduct Waterfowl Hunting at Stewart B. McKinney National Wildlife Refuge’s Great Meadows Unit, Stratford, Connecticut Revised with Cumulative Impacts February 2007.” The EA was developed with the assistance of State biologists with expertise and experience in the research and management of waterfowl populations. The draft document was sent to Dale May, Director of the Connecticut Department of Environmental Protection, Wildlife Division. In a letter dated March 27, 2007, Mr. May concurred with the document’s cumulative analysis assessment the Service conducted. “The analysis, an exhaustive examination of the effects of the hunt program on migratory birds, endangered species, human recreation, and Refuge resources, concluded that the hunting program had no negative effect, either locally or from a flyway perspective. We agree that the timing of the hunting season, prior Section 7 consultations, and the conservative nature of the hunt program (hunt 3 days/week) all contribute to pose no adverse effect to other natural resources.”

Notices were published in the Connecticut Post on March 15, 2007. A press release was sent to the following local news papers on March 13, 2007: Main Street News; Clinton Recorder; New Haven Register; The Day; Branford Review; Shoreline Times; Shore Publishing; Connecticut Post; The Hartford Courant; and Greenwich Times. The public notices were posted at the following location by March 14, 2007: Westbrook, CT Post Office; Westbrook, CT Town Hall; Main Postal Delivery Center in Stratford, CT; Stratford, CT Public Library; and the Westbrook CT Public Library.

The Honorable James R. Miron, Mayor of the Town of Stratford was contacted and asked for comments or support for the Draft EA.

The documents were available for review from the Stewart B. McKinney National Wildlife Refuge Headquarters and on the Refuge’s web page. One hundred forty-five comments were in support of the Service's Proposed Action Alternative (Proposed Action) in the Draft Environmental Assessment (Draft EA). Twenty seven comments opposed the Service’s Proposed Action. The Service received comments from two organizations: the Humane Society of the United States (HSUS) in opposition to the proposed action and the Safari Club International/ Safari Club International Foundation (SCI) which supported the proposed action. The Service has summarized these comments and written responses in appendix E of this document.

V11I. REGULATORY COMPLIANCE

National Environmental Policy Act

The Service has prepared this EA according to Council on Environmental Quality regulations (40 CFR Parts 1500 through 1508) which implement the procedural requirements of the National Environmental Policy Act (NEPA) of 1969, as amended (42 USC 4321 *et seq.*). NEPA requires agencies of the federal government to study the possible environmental impacts of major federal actions significantly affecting the quality of the human environment. NEPA establishes an environmental policy for the nation, provides an interdisciplinary framework for environmental planning by federal agencies, and contains procedures to ensure that federal agency decision-makers take environmental factors into account. Under NEPA, Congress authorizes and directs federal agencies to carry out their regulations, policies, and programs as fully as possible in accordance with the statutes policies on environmental protection. NEPA requires federal agencies to make a series of evaluations that anticipates adverse effects on environmental resources.

National Historic Preservation Act

The National Historic Preservation Act of 1966 (NHPA), as amended (16 USC 470 *et seq.*) and its implementing regulations 36 CFR requires the Service to consult with the State Historic Preservation Office (SHPO) prior to actions to ensure that no historic properties would be affected by the proposed action.

Endangered Species Act

The Endangered Species Act of 1973 (ESA) as amended (16 USC 1531 *et seq.*) establishes a national program for the conservation of threatened and endangered species of fish, wildlife, and plants; and the preservation of the ecosystems on which they depend. Section 7 interagency cooperation requires any federal agency authorizing, funding, or carrying out any action to ensure that the action is not likely to jeopardize the continued existence of any endangered species or threatened species, or result in the destruction or adverse modification of critical habitat for such species.

The National Wildlife Refuge System Improvement Act

The National Wildlife Refuge System Improvement Act of 1997 defines compatible wildlife-dependent recreation as “legitimate and appropriate general public use of the (National Wildlife Refuge) System.” It establishes hunting, fishing, wildlife observation and photography, and environmental education and interpretation as “public priority uses” where compatible with the mission and purpose of individual National Wildlife Refuges.

The Fish and Wildlife Coordination Act and Migratory Bird Hunting and Conservation Stamp Act

The Fish and Wildlife Coordination Act (16 U. S. C. 661-667e), and the Migratory Bird Hunting and Conservation Stamp Act (16 U.S.C. 718) contain regulatory sections authorizing the Secretary to make all appropriate rules and regulations which are necessary for the effective administration of these lands within the National Wildlife Refuge System. This includes the

authority to regulate public use activities such as hunting and fishing, providing the regulations are reasonable and appropriate, consistent with the statutory source of the regulatory authority, and compatible with the purposes for which the area was established.

Connecticut Coastal Protection Act of 1990

Section 204 of the Connecticut Coastal Protection Act of 1990 (P.L. 101-443) authorizes the Secretary to "...administer all lands, waters, and interests therein, acquired under section 203 of this Act in accordance with the provisions of the National Wildlife Refuge System Administration Act of 1966"(16 U.S.C. 668dd). The Connecticut Coastal Protection Act adds provisions for the Secretary to "...utilize such additional statutory authority as may be available to him for the conservation and development of wildlife and natural resources, the development of outdoor recreation opportunities, and interpretive education as he deems appropriate to carry out the purposes of the refuge."

Executive Orders

Executive Order 11514 protection and enhancement of environmental quality, directs federal agencies to continuously monitor and control activities to protect and enhance the quality of the environment. The order also requires agencies to develop procedures to ensure the fullest practical provisions of timely public information and the understanding of Federal plans and programs with potential environmental impacts and to obtain the views of interested parties.

Executive Order 12898 Federal actions to address environmental justice and minority populations and low income populations, directs federal agencies to identify disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low income populations.

Executive Order 12996 Management and General Public Use of the National Wildlife Refuge System" recognizes "compatible wildlife-dependent recreational uses involving hunting, fishing, wildlife observation and photography, and environmental education and interpretation as priority public uses of the Refuge System" (Page 111 STAT. 1253). For purposes of this Act: "(1) The term 'compatible use' means a wildlife-dependent recreational use or any other use of a refuge that, in the sound professional judgment of the Director, will not materially interfere with or detract from the fulfillment of the mission of the System or the purposes of the

Service policy

Service policy concerning hunting (Refuge Manual, Chapter 8, Paragraph 5.3) requires consideration of the following criteria and standards: (1) compatibility with the specific wildlife objectives of the refuge and the overall objectives of the National Wildlife Refuge System; (2) biological soundness; (3) economic feasibility; and (4) recreational opportunity, including a consideration of the effects of excessive demand on the quality of the hunting experience and public safety.

IX. REFERENCES

- Andrle, R. F. and J. R. Carroll, eds. 1988. *The Atlas of Breeding Birds in New York State*. Cornell University Press: Ithaca, NY. p. 103.
- Andersen, D. E. 1984. *Military training and the ecology of raptor populations at Fort Carson, Colorado*. M.Sc. Thesis, University of Wisconsin, Madison, WI.
- Andersen, D. E., O.J. Rongstad, and W. R. Mytton. 1990. Home-range changes in raptors exposed to increased human activity levels in southeastern Colorado. *Wildlife Society Bulletin* 18: 134-142.
- Bevier, L. R., ed. 1994. *The Atlas of Breeding Birds of Connecticut*. CT DEP, State Geological and Natural History Survey, Bulletin 113. Hartford, CT.
- Butkovsky, P. 1976. *A tour of the Great Meadows Marsh*. Connecticut Audubon Society. 44 pp.
- Connecticut Department of Environmental Protection (CT DEP) Water Management Bureau. 1998. *Connecticut Water bodies not Meeting Water Quality Standards; List 303(d)*. CT DEP.
- CT DEP. 2002. *Connecticut Recreational Use Statute*. General Statutes of Connecticut, Title 52: Civil Actions, Chapter 557: Landowner Liability for Recreational Use of Land. http://www.americanwhitewater.org/resources/repository/Connecticut_Recreational_Use_Statute.htm. CT DEP.
- CT Department of Environmental Protection. 2005. *Connecticut's Comprehensive Wildlife Conservation Strategy*. Bureau of Natural Resources. http://ct.gov/dep/cwp/view.asp?a=2723&q=329520&depNav_GID=1719
- CT DEP. 2007. *Midwinter Waterfowl Survey and Waterfowl Breeding Survey data provided by Min Huang, Waterfowl Biologist, Franklin Swamp Wildlife Management Area*. February 2007.
- Dreyer, G. D., and W.A. Nierring, ed. 1995. *Tidal Marshes of the Long Island Sound; Ecology, History, and Restoration*. The Connecticut College Arboretum, Bulletin No. 34, December 1995. At the site: <http://camel2.conncoll.edu/ccrec/greenet/arbo/publications/34/MAIN.HTM>
- Ehrlich, P.R., D.S. Dobkin, and D. Wheye. 1988. *The Birder's Handbook; A Field Guide to Natural History of North American Birds*. Simon and Schuster Inc., New York, NY. P. 226.
- Herblen, Thomas A. 1991. Changing attitudes and funding for wildlife - preserving the sport hunter. *Wildl. Soc. Bull.* 19(4): 528-534.

- King's Mark Environmental Review Team. 1987. Environmental Review Team Report: Long Beach, Stratford, CT. Wallingford (CT): King's Mark Resource Conservation and Development Area, Inc. 83 pp.
- Knight, R. L., and D. N Cole. 1995. Wildlife responses to recreationists. Pages 71-79 in R. L Knight and K. J Gutzwiller, ed. *Wildlife and Recreationists: coexistence through management and research*. Island Press, Washington D. C. 372 pp.
- Madsen, J. 1995. Impacts of disturbance on migratory waterfowl. *Ibis* 137:S67-S74.
- McCann, W. 1979. Environmental assessment for proposed acquisition of Great Meadows, Stratford, Connecticut. U.S. Fish and Wildlife Service.
- National Oceanic and Atmospheric Administration (NOAA). 1901-2001 Connecticut Climate Summary. <http://lwf.ncdc.noaa.gov/oa/climate/research/cag3/CT.html>. National Climatic Data Center. Asheville, North Carolina.
- The Nature Conservancy Connecticut Chapter. 1993. *Great Meadows in Balance. From the Land; Spring*. The Nature Conservancy.
- Niering, W.A. 1977. Memo to Attorney Thomas Gerety on: Great Meadows Marsh (testimony). 6 pp.
- Paulus, S.L. 1984. Activity budgets of nonbreeding gadwalls in Louisiana. *J. Wildl. Manage.* 48:371-380.
- Purdy, K. G., G. R. Goft, D. J. Decker, G. A. Pomerantz, N. A. Connelly. 1987. *A guide to managing human activity on National Wildlife Refuges*. Office of Information Transfer, U.S. Fish and Wildlife Service, Ft. Collins, CO. 57 pp.
- Schneider, K. J. and D. M. Pence, eds. 1992. *Migratory nongame birds of management concern in the Northeast*. U.S. Department of the Interior, Fish and Wildlife Service, Newton Corner, Massachusetts. 400pp.
- Shueck, L. S., J. M. Marzluff, and K. Steenhof. 2001. Influence of military activities on raptor abundance and behavior. *The Condor* 103: 606-615.
- Teal, J. M. 1986. *The Ecology of Regularly Flooded Salt Marshes of New England: A Community Profile*. U.S. Fish and Wildlife Service Biological Report 85(7.4). 61pp. http://training.fws.gov/library/Biological%20Reports/85_7.4.pdf
- U.S. Department of the Interior, Fish and Wildlife Service, and U.S. Department of Commerce, Bureau of the Census. 2001. *National Survey of Fishing, Hunting, and Wildlife Associated Recreation*.

- U.S. Environmental Protection Agency. 1994. The Long Island Sound Study - the comprehensive conservation and management plan. Stamford, Connecticut. 168 pp.
- U.S. Fish and Wildlife Service. 1989a. Environmental assessment proposal to expand the Stewart B. McKinney National Wildlife Refuge. 28 pp.
- U.S. Fish and Wildlife Service. 1989b. North American Waterfowl Management Plan: Atlantic Coast Joint Venture. USFWS Region 5, Newton Corner, MA. 106pp.
- U.S. Fish and Wildlife Service. 1991. Northeast coastal areas study: significant coastal habitats of southern New England and portions of Long Island, New York. Southern New England-Long Island Sound Coastal Estuary Office, Charlestown, Rhode Island. 249 pp.
- U.S. Fish and Wildlife Service. 1993. Environmental assessment proposal to expand the waterfowl hunting areas of the Edwin B. Forsythe National Wildlife Refuge Atlantic, Burlington and Ocean Counties, New Jersey. 28 pp.
- U.S. Fish and Wildlife Service. 1995. Nongame Birds of Management Concern-The 1995 List. U.S. Department of the Interior, Washington, D.C.
<http://migratorybirds.fws.gov/reports/speccon/tblconts.html>
- U.S. Fish and Wildlife Service. 2001. Habitat Restoration Planning Great Meadows Unit, Stewart B. McKinney NWR, Stratford, CT. Southern New England-New York Bight Coastal Program, Charlestown, RI, unpublished report; August 2001. 17pp.
- U.S. Fish and Wildlife Service. 2002. Draft Environmental Impact Statement Resident Canada Goose Management. U.S. Department of Interior, Washington, D.C.
http://migratorybirds.fws.gov/issues/cangeese/DRAFT_EIS
- U.S. Fish and Wildlife Service 2006. Waterfowl Populations Status. 2006, Division of Migratory Bird Management, Laurel, Maryland. 60 pp.
- U.S. Fish and Wildlife Service. 2007. Atlantic Flyway and Connecticut mid-winter waterfowl survey data from 2001-2006. Migratory Birds website <http://mbdcapps.fws.gov/>. February 15, 2007.

X APPENDICES

- A. Connecticut Department of Environmental Protection (DEP) 2007 Migratory Bird Hunting Guide
- B. Connecticut DEP 2007 Hunting and Trapping Field Guide; Laws and Regulations
- C. Stewart B. McKinney National Wildlife Refuge Great Meadows Unit Bird List
- D. Connecticut Department of Economic and Community Development Stratford Town Profile November 2001

**Appendix A. Connecticut Department of Environmental Protection (DEP)
2006-2007 Migratory Bird Hunting Guide**

The current migratory bird hunting guide can be found at the website:

http://www.ct.gov/dep/cwp/view.asp?a=2700&q=323426&depNav_GID=1633

Appendix B. Connecticut Department of Environmental Protection (DEP)
2007 Hunting and Trapping Field Guide; Laws and Regulations

The current Hunting and Field Trapping Guide laws and regulations can be found at:

http://www.ct.gov/dep/cwp/view.asp?a=2700&q=323392&depNav_GID=1633

**Appendix C. Stewart B. McKinney National Wildlife Refuge
Great Meadows Unit Bird List**

Stewart B. McKinney National Wildlife Refuge Great Meadows Unit Bird List

Created 11/99

Most birds are migratory, therefore their seasonal occurrence is coded as follows:

SEASON

s	Spring	March-May	
S	Summer		June-August
F	Fall		September-November(beginning in July for some shorebirds)
W	Winter		December-February

RELATIVE ABUNDANCE

a	abundant	a species which is very numerous
c	common	likely to be seen or heard in suitable habitat
f	fairly common	usually present in smaller numbers
o	occasional	present, but not certain to be seen
r	rare	seen only a few times during a season
v	very rare	may be present, but not every year
x	accidental	not to be expected, but has shown up in Connecticut or surrounding states.

SE	State Endangered
ST	State Threatened
SC	State Species of Concern
FE	Federally Endangered
FT	Federally Threatened

The additional Occurrence Information column includes information from "List of Bird Species Documented at Long Beach and the Great Meadows in the 20th Century", as presented in the "Sikorsky Memorial Airport Final Environmental Impact Statement for the Proposed Improvements to Runway 6-24" (Volume II, Technical Appendix C, May 1999). The original list was prepared by Charles F. Hiss for the King's Mark Environmental Review Team Report (1987) and annotated by local ornithologist Milan Bull on 10/17/86 and 10/11/96.

Seasonal Occurrence Codes:

S	summer resident
R	permanent resident
W	winter resident
X	accidental
T	transient
N	nested
PN	probable nesting

	s	S	F	W	Occurrence Info.
LOONS - GREBES					
___ Red-throated Loon	f	v	f	f	W
<u>SC</u> Common Loon	f	r	f	o	W
<u>SE</u> Pied-billed Grebe.....	o	r	o	o	T, S, N
___ Horned Grebe.....	c		c	f	W
___ Red-necked Grebe	r		r	v	T
SHEARWATERS - STORM-PETRELS					
___ Wilson's Storm-Petrel	v				
GANNET - PELICANS - CORMORANTS					
___ Northern Gannet.....	r	x	r	v	
___ Great Cormorant	f	x	f	f	W
___ Double-crested Cormorant	a	a	a	o	T, S
BITTERNs - HERONS - IBISES					
<u>SE</u> American Bittern.....	o	v	o	r	TN
<u>ST</u> Least Bittern	v	v	v		SN
___ Great Blue Heron	c	o	c	f	T
<u>ST</u> Great Egret	c	c	c	r	S
<u>ST</u> Snowy Egret	c	c	c	v	S
<u>SC</u> Little Blue Heron	r	r	o		S
___ Tricolored Heron	v	v	r		T
<u>SC</u> Cattle Egret	v	v	v		S
___ Green Heron	f	o	f		S, N
___ Black-crowned Night-Heron	a	a	a	r	R, N
<u>SC</u> Yellow-crowned Night-Heron.....	r	r	o		S
<u>SC</u> Glossy Ibis	f	f	f		S
SWANS - GEESE - DUCKS					
___ Tundra Swan	v		v	x	
___ Mute Swan	c	f	c	a	R, N
___ Snow Goose	o		o	r	T
___ Brant	c	v	c	o	R
___ Canada Goose	a	f	a	c	R
___ Wood Duck	r	v	r	v	
___ Green-winged Teal	c	v	c	o	S, T, N
___ American Black Duck	a	f	a	a	R, N
___ Mallard	c	c	c	c	R, N
___ Northern Pintail	r	x	r	r	T
<u>ST</u> Blue-winged Teal	o	v	o	x	S, T, N
___ Northern Shoveler	r	x	r	v	S, T, N
___ Gadwall	f	o	f	f	T
___ Eurasian Wigeon	v		v	v	

Stewart B. McKinney National Wildlife Refuge

Bird List

		s	S	F	W	Occurrence Info.
___	American Wigeon	f		f	o	W
___	Canvasback	f		f	f	W
___	Redhead	v		v	v	W
___	Ring-necked Duck	r		r	v	
___	Greater Scaup	c		c	f	W
___	Lesser Scaup	f		f	o	W
___	Common Eider	r	x	r	v	X
___	King Eider	v	x	v	v	X
___	Harlequin Duck	v		v	v	
___	Oldsquaw	f	v	f	o	W
___	Black Scoter	r		r	r	W
___	Surf Scoter	f		f	o	T
___	White-winged Scoter	c	v	c	f	W
___	Common Goldeneye	c	v	c	c	W
___	Barrow's Goldeneye	v		v	v	W
___	Bufflehead	c	v	c	f	W
___	Hooded Merganser	f	v	f	o	T
___	Common Merganser	r		r	r	W
___	Red-breasted Merganser	a	r	a	c	W
___	Ruddy Duck.....	r		r	r	X

VULTURES - HAWKS - FALCONS

___	Turkey Vulture	f		o	f	r	
___	Osprey	f		f	f	v	T,
<u>SE</u>	<u>FE</u> Bald Eagle	r	x	r	v		X
<u>SE</u>	Northern Harrier	f	r	f	f		W, PN
<u>SE</u>	Sharp-shinned Hawk	f	v	c	r		T
<u>ST</u>	Cooper's Hawk	o	v	f	r		T
___	Northern Goshawk	r	v	o	v		
<u>SC</u>	Red-shouldered Hawk	o	r	o	r		
___	Broad-winged Hawk	o	r	f			
___	Red-tailed Hawk	f	o	f	o		T
___	Rough-legged Hawk	v		v	v		W
<u>SC</u>	American Kestrel	f	r	f	r		R, N
___	Merlin	o	v	o	r		T
<u>SE</u>	Peregrine Falcon	r	o	o	r		T
___	Gyrfalcon	v		v	v		

GROUSE - QUAIL - TURKEY

___	Ring-necked Pheasant	v	v	v	v		R
___	Ruffed Grouse	v	v	v	v		
___	Wild Turkey	o	f	f	o		
___	Northern Bobwhite	v	v	v	v		

	s	S	F	W	Occurrence Info.
RAILS - CRANES					
<u>SE</u> Black Rail	v	x	v		PN
___ Clapper Rail	c	c	c	r	R, N
<u>SE</u> King Rail	v	v	v	x	SN
___ Virginia Rail	o	o	o	v	R, N
___ Sora	v	v	v	v	T, N
<u>SE</u> Common Moorhen	v	v	v	x	S, N
___ American Coot	o	v	o	o	T
PLOVERS - SANDPIPERS					
___ Black-bellied Plover	c	v	a	o	T
___ American Golden-Plover	v		r		T
___ Semipalmated Plover	c	v	c		T
<u>ST, FE</u> Piping Plover	o	o	o		N
___ Killdeer	f	f	f	o	R, N
<u>SC</u> American Oystercatcher	o	o	o	v	S
___ American Avocet	x		v		X
___ Greater Yellowlegs	c	o	c	r	T
___ Lesser Yellowlegs	f	v	c	x	T
___ Solitary Sandpiper	o	x	o		T
<u>SC</u> Willet	f	f	c		T, N
___ Spotted Sandpiper	f	o	f		S, N
<u>SE</u> Upland Sandpiper	v	x	v		T
___ Whimbrel	v		r		T
___ Hudsonian Godwit	x		v		T
___ Marbled Godwit	x		v		X
___ Ruddy Turnstone	f	v	f	o	T
___ Red Knot	o	x	o	v	T
___ Sanderling	f	x	c	o	W
___ Semipalmated Sandpiper	a	r	a		T
___ Western Sandpiper	v		r	x	T
___ Least Sandpiper	c	v	c		T
___ White-rumped Sandpiper	v		o		T
___ Baird's Sandpiper			v		T
___ Pectoral Sandpiper	r		o		T
___ Purple Sandpiper	f		f	o	W
___ Dunlin	c		c	o	W
___ Stilt Sandpiper	v		r		T
___ Buff-breasted Sandpiper			v		X
___ Short-billed Dowitcher	o	r	c		T
___ Long-billed Dowitcher	x		r		T
___ Common Snipe	f		f	r	T
___ American Woodcock	o	o	o	v	W
___ Wilson's Phalarope	x		v		T

JAEGERS - GULLS - TERNS - AUKS

	s	S	F	W	Occurrence Info.
___ Laughing Gull	o	o	c	r	T
___ Little Gull	v		v	x	
___ Black-headed Gull	v		v	v	X
___ Bonaparte's Gull	c	v	c	o	T
___ Ring-billed Gull	c	o	c	c	T, W
___ Herring Gull	a	c	a	a	T, W, N
___ Iceland Gull	r		r	r	T
___ Lesser Black-backed Gull	v	x	v	v	
___ Glaucous Gull	v		v	v	T
___ Great Black-backed Gull	c	c	c	c	T, W
___ Caspian Tern	v	x	v		
___ Royal Tern	x	v	v		
<u>SC</u> Common Tern	a	a	a		S, T, N
___ Forster's Tern	v	x	o	x	T
<u>ST</u> Least Tern	f	f	f		S, N
___ Black Tern	v		r		T
<u>FE, SE</u> Roseate Tern	o	o	o	(Milford and Falkner)	T
___ Black Skimmer	v	v	r		T

DOVES - PARROTS - CUCKOOS - OWLS

SWIFTS - HUMMINGBIRDS

___ Rock Dove	c	c	c	c	R, N
___ Mourning Dove	c	c	c	c	R, N
___ Monk Parakeet	o	o	o	o	T, N
___ Black-billed Cuckoo	o	r	o		T
___ Yellow-billed Cuckoo	o	o	o		T
<u>SE</u> Barn Owl	v	x	v	x	X
___ Eastern Screech-Owl	r	v	r	r	
___ Great Horned Owl	f	o	f	f	X
___ Snowy Owl	v		v	v	W
___ Barred Owl	v	v	v	v	

		s	S	F	W	Occurrence Info.
<u>ST</u>	Short-eared Owl	o	x	o	r	W
<u>SC</u>	Northern Saw-whet Owl	v		v	v	
<u>ST</u>	Common Nighthawk	o	x	f		T
<u>SC</u>	Whip-poor-will	v	v	v		
___	Chimney Swift	c	o	a		T
___	Ruby-throated Hummingbird	o	r	o		T
___	Belted Kingfisher	o	o	o	o	S, T

WOODPECKERS - FLYCATCHERS

<u>SE</u>	Red-headed Woodpecker	v	x	v	v	
___	Red-bellied Woodpecker	f	f	f	f	
___	Yellow-bellied Sapsucker	r		o	v	T
___	Downy Woodpecker	c	f	c	c	R, N
___	Hairy Woodpecker	o	o	o	o	W
___	Northern Flicker	c	f	c	o	T
<u>SC</u>	Olive-sided Flycatcher	v		v		T
___	Eastern Wood-Pewee	f	f	f		T
___	Yellow-bellied Flycatcher	r		r		T
___	Acadian Flycatcher	v	x	v		
<u>SC</u>	Alder Flycatcher	r	x	r		
___	Willow Flycatcher	f	f	f		S
___	Least Flycatcher	f	v	f		T
___	Eastern Phoebe	c	f	c	v	T
___	Great Crested Flycatcher	f	f	f		T
___	Western Kingbird			v	x	
___	Eastern Kingbird	f	o	a		S

LARKS - SWALLOWS - JAYS - CROWS

<u>ST</u>	Horned Lark.....	o	v	f	o	RN
<u>SC</u>	Purple Martin	r	v	r		T
___	Tree Swallow	c	f	a	v	T
___	Northern Rough-winged Swallow ...	f	o	f		T
___	Bank Swallow	o	o	f		T
___	Cliff Swallow	r	v	o		T
___	Barn Swallow	a	c	a		S, T
___	Blue Jay.....	a	c	a	c	S, W, T
___	American Crow	a	c	a	a	W
___	Fish Crow	o	o	o	r	S, T

TITMICE - NUTHATCHES - WRENS

___	Black-capped Chickadee.....	a	c	a	c	W
___	Tufted Titmouse	c	f	c	c	W
___	Red-breasted Nuthatch	r	v	o	r	T
___	White-breasted Nuthatch	c	f	c	f	W

		s	S	F	W	Occurrence Info.
___	Brown Creeper	o	r	o	r	T
___	Carolina Wren	f	f	f	f	T
___	House Wren	a	c	a	x	T
___	Winter Wren	o	x	o	r	T
<u>SE</u>	Sedge Wren	v	x	v		T
___	Marsh Wren.....	c	c	c	v	R, N

KINGLETS - THRUSHES - THRASHERS

___	Golden-crowned Kinglet	c		c	o	T
___	Ruby-crowned Kinglet	f		o	r	T
___	Blue-gray Gnatcatcher	f	v	c	x	T
___	Northern Wheatear			v		
___	Eastern Bluebird	f	o	f	o	
___	Veery	f	f	f	x	T
___	Gray-cheeked Thrush	v		v		
___	Bicknell's Thrush	v		v		
___	Swainson's Thrush	o		o		T
___	Hermit Thrush	f	v	f	o	T
___	Wood Thrush	c	f	c	x	T
___	American Robin	a	c	a	f	S
___	Gray Catbird	a	c	a	r	S
___	Northern Mockingbird	f	f	f	f	R, N
<u>SC</u>	Brown Thrasher	o	o	o	r	T

WAXWINGS - SHRIKES - STARLINGS

___	American Pipit	r		o	v	
___	Cedar Waxwing	c	o	c	f	T
___	Northern Shrike	v		v	v	T
___	European Starling	a	c	a	a	R, N

VIREOS - WOOD WARBLERS

___	White-eyed Vireo	o	o	o		T
___	Blue-headed Vireo	o	x	f		T
___	Yellow-throated Vireo	o	r	o		T
___	Warbling Vireo	f	r	o		T
___	Philadelphia Vireo	r		r		
___	Red-eyed Vireo	a	c	a		T
___	Blue-winged Warbler	f	f	f		T
___	Tennessee Warbler	o		o		T
___	Orange-crowned Warbler	v		r	v	X
___	Nashville Warbler	o	x	o		T
<u>SC</u>	Northern Parula	c	x	c		T
___	Yellow Warbler	c	f	c		S, N
___	Chestnut-sided Warbler	f	v	f		T

Stewart B. McKinney National Wildlife Refuge

Bird List

		s	S	F	W	Occurrence Info.
___	Magnolia Warbler	f		f		T
___	Cape May Warbler	r		o		T
___	Black-throated Blue Warbler	f		f		T
___	Yellow-rumped Warbler	a		a	o	T
___	Black-throated Green Warbler	c	x	c		T
___	Blackburnian Warbler	o	x	o		T
___	Prairie Warbler	o	r	o		T
___	Palm Warbler	c		c	v	T
___	Bay-breasted Warbler	o		o		T
___	Blackpoll Warbler	a		a		T
___	Black-and-white Warbler	f	o	f		T
___	American Redstart	c	v	a		T
___	Worm-eating Warbler	o	o	o		T
___	Ovenbird	c	c	c		T
___	Northern Waterthrush	o	x	o		T
___	Louisiana Waterthrush	r	x	r		T
___	Common Yellowthroat	a	c	a	v	S, N
___	Wilson's Warbler	o		o		T
___	Canada Warbler	o	v	o		T
<u>SE</u>	Yellow-breasted Chat	v	x	v	x	T

TANAGERS - SPARROWS

___	Summer Tanager	v	x	x	x	
___	Scarlet Tanager	f	o	f		T
___	Northern Cardinal	c	c	c	c	R, N
___	Rose-breasted Grosbeak	f	o	f		T
___	Blue Grosbeak	v	x	x		X
___	Indigo Bunting	o	r	o		T
___	Eastern Towhee	c	c	c	o	T
___	American Tree Sparrow	c		c	f	W
___	Chipping Sparrow	c	o	c	v	T
___	Clay-colored Sparrow	v	x	v		
___	Field Sparrow	f	r	f	o	T
<u>SE</u>	Vesper Sparrow	v	x	r	x	T
<u>SC</u>	Savannah Sparrow	c	v	c	o	T, W, N
<u>SE</u>	Grasshopper Sparrow	v	x	v		X
<u>SC</u>	Henslow's Sparrow	x	x	v		
<u>SC</u>	Salt Marsh Sharp-tailed Sparrow.....	o	o	f	x	S, N
___	Nelson's Sharp-tailed Sparrow	o		f	v	
<u>SC</u>	Seaside Sparrow	o	o	o	v	S, N
___	Fox Sparrow	o		o	r	T
___	Song Sparrow	c	c	c	f	R, N
___	Lincoln's Sparrow	o		o	x	T
___	Swamp Sparrow	f	o	f	o	T, W

	s	S	F	W	Occurrence Info.
___ White-throated Sparrow	a	x	a	c	W, T
___ White-crowned Sparrow	o		o	r	T
___ Dark-eyed Junco	a	v	a	c	W
___ Lapland Longspur	o		o	r	W
___ Snow Bunting	f		f	o	W

BLACKBIRDS -FINCHES

___ Bobolink	f	v	f		
___ Red-winged Blackbird	a	a	a	f	S, T, N
<u>SC</u> Eastern Meadowlark	r	v	r	r	
___ Rusty Blackbird	r		r	r	T
___ Boat-tailed Grackle	r	r	r	v	T
___ Common Grackle	a	f	a	o	R, N
___ Brown-headed Cowbird	a	c	a	f	R, N
___ Orchard Oriole	r	v	r		T
___ Baltimore Oriole	f	o	f	v	S
___ Pine Grosbeak	v		v	v	
___ Purple Finch	o	x	o	r	T
___ House Finch	a	f	a	c	R, N
___ Common Redpoll	v		v	v	W
___ Pine Siskin	r	x	r	r	T
___ American Goldfinch	a	c	a	c	S, T
___ Evening Grosbeak	r	x	r	v	T
___ House Sparrow	c	c	c	c	R, N

Accidental species

___ Arctic/Pacific Loon*	x		x	x	
___ Eared Grebe	x		x	x	
___ Northern Fulmar	x		x	x	
___ Cory's Shearwater		x	x		
___ Greater Shearwater	x	x	x		
___ Sooty Shearwater		x	x		
___ Manx Shearwater	x	x	x		
___ Audubon's Shearwater		x	x		
___ Leach's Storm-Petrel		x	x		
___ American White Pelican	x	x	x	x	
___ Brown Pelican.....		x	x		
___ White-faced Ibis	x		x		
___ Greater White-fronted Goose ..	x		x	x	
___ Ross' Goose	x		x	x	
___ Tufted Duck	x		x	x	
___ Black Vulture	x	x	x	x	
___ Mississippi Kite	x	x	x	x	
___ Swainson's Hawk	x		x		

Stewart B. McKinney National Wildlife Refuge

Bird List

		s	S	F	W	Occurrence Info.
___	Golden Eagle	X		X	X	
___	Yellow Rail	X		X		
___	Purple Gallinule	X	X	X	X	
___	Sandhill Crane		X	X		
___	Northern Lapwing	X		X		
___	Black-necked Stilt	X	X	X		
___	Curlew Sandpiper	X		X		
___	Ruff	X		X		
___	Red-necked Phalarope	X		X		
___	Red Phalarope	X		X		
___	Pomarine Jaeger	X		X		
___	Parasitic Jaeger	X		X		
___	Long-tailed Jaeger	X		X		
___	Franklin's Gull	X		X	X	
___	Black-tailed Gull.....	X		X	X	
___	Mew Gull	X		X	X	
___	California Gull.....	X		X	X	
___	Yellow-legged Gull.....	X		X	X	
___	Thayer's Gull	X		X	X	
___	Ross' Gull	X		X	X	
___	Sabine's Gull	X		X		
___	Ivory Gull				X	
___	Gull-billed Tern	X	X	X		
___	Sandwich Tern	X	X	X		
___	Arctic Tern	X		X		
___	Bridled Tern		X	X		
___	Sooty Tern		X	X		
___	White-winged Tern	X		X		
___	Dovekie*				X	
___	Common Murre				X	
___	Razorbill				X	
___	Long-billed Murrelet.....				X	
___	Black Guillemot				X	
___	Atlantic Puffin.....				X	
___	Eurasian Collared Dove	X	X	X	X	
___	Northern Hawk Owl				X	
___	Great Gray Owl				X	
___	Boreal Owl				X	
___	Chuck-will's widow	X	X	X		
___	Three-toed Woodpecker				X	
___	Black-backed Woodpecker				X	
___	Ash-throated Flycatcher	X		X	X	
___	Gray Kingbird	X		X	X	
___	Scissor-tailed Flycatcher	X	X	X		

		s	S	F	W	Occurrence Info.
___	Fork-tailed Flycatcher	x	x	x		
___	Common Raven.....	x	x	x	x	
___	Boreal Chickadee	x		x	x	
___	Townsend's Solitaire	x		x	x	
___	Varied Thrush	x		x	x	
___	Bohemian Waxwing	x		x	x	
___	Loggerhead Shrike	x	x	x	x	
___	Western Tanager	x		x	x	
___	Black-headed Grosbeak	x		x	x	
___	Dickcissel	x	x	x	x	
___	Golden-crowned Sparrow	x		x	x	
___	Lark Sparrow	x		x	x	
___	Le Conte's Sparrow	x		x		
___	Chestnut-collared Longspur	x	x	x	x	
___	Yellow-headed Blackbird	x		x	x	
___	Brewer's Blackbird	x		x	x	
___	Bullock's Oriole.....	x		x	x	
___	Hoary Redpoll	x		x	x	

Additional Accidental species according to the "List of Bird Species Documented at Long Beach and the Great Meadows in the 20th Century":

- ___ Western Grebe
- ___ Wilson's Plover
- ___ Long-billed Curlew
- ___ Black-legged Kittiwake
- ___ Prothonotary Warbler
- ___ Red Crossbill
- ___ Long-eared Owl
- ___ Ipswich Sparrow
- ___ Smith's Longspur

Appendix D. Connecticut Department of Economic and Community
Development Stratford Town Profile
November 2001

The current Stratford Town Profile is available at:
<http://www.ct.gov/e cd/cwp/view.asp?a=1106&q=251024&ecdNav=>

Appendix E. Response to Public Comments

We received 174 comments on our draft EA titled “Proposal to Establish and Conduct Waterfowl Hunting at Stewart B. McKinney National Wildlife Refuge, Great Meadows Unit, Stratford Connecticut, which was available for public comment between March 15, 2007 through April 13, 2007. Notices were published in the Connecticut Post on March 15, 2007. The documents were available for review from the Stewart B. McKinney National Wildlife Refuge Headquarters and the Refuge’s web page. One hundred forty five of the comments were in support of the Service’s Proposed Action Alternative (Proposed Action) in the Draft Environmental Assessment (Draft EA). Twenty seven comments opposed the Service’s Proposed Action. The Service received comments from two organizations the Humane Society of the United States (HSUS) in opposition to the proposed action and the Safari Club International/ Safari Club International Foundation (SCI) which supported the proposed action. The Service has summarized comments and responds to them below.

Comment: The majority of the 27 comments from individuals opposed to the proposed action were not in favor of hunting on areas managed as a wildlife refuge such as the GMU.

Response: Legislation establishing the GMU (see page 5) allows the Service to provide opportunities for fish and wildlife-oriented recreation. A recreational waterfowl hunting program may be permitted if compatible with the purposes for which the Refuge was established. A Compatibility Determination which found waterfowl hunting compatible with the purposes of the Refuge was signed on January 19, 2005.

Comment: Several of the 27 comments from individuals opposed to the proposed action were concerned that a number of species of waterfowl are in decline and that waterfowl should not be hunted.

Response: As stated in the Cumulative Impacts Section (see page 39) of this EA, although individuals within the waterfowl population would be harvested, hunting would not adversely impact total waterfowl populations. The State of Connecticut, in consultation with the Service, establishes daily and seasonal bag limits and season lengths by species prior to each hunting season by considering factors such as population size and trends, geographical distribution, annual breeding effort, the condition of breeding and wintering habitat, the number of hunters, and the anticipated harvest. The Service and State of Connecticut regulate waterfowl harvest to ensure there will be no long term impact on waterfowl population.

Comment: A commenter opposed to the proposed action states the hunting experience would only come at the expense of the ever growing recreational use of the Refuge and the purpose for which the refuge was acquired. The commenter stated this is not a morally acceptable trade-off.

Response: As stated in this EA on page 47, as public use levels of other recreational activities expand over time, unanticipated conflicts between user groups may occur. The Refuge’s visitor use programs would be adjusted as needed to eliminate or minimize each occurrence and provide

quality wildlife-dependent recreational opportunities. The proposed alternative would not compromise public safety, and would not limit the other recreational use of the GMU by the public. All areas of the Great Meadows are currently closed to the public unless a Special Use Permit has been approved. The Refuge is in the process of opening an interpretive trail with viewing platforms at the Great Meadows Unit which will facilitate the only anticipated wildlife dependent recreation of wildlife observation, education, interpretation, and photography. Areas designated as open to waterfowl hunting would be consciously located away from any public visitor areas. While the proposed hunting activity does not pose a public safety concern, some members of the public have indicated they would not visit the Refuge during hunt days. Limiting hunting to 3 days per week would provide ample hunt-free days and increase waterfowl viewing opportunities at the site.

Comment: A commenter opposed to the proposed action states “The meadows are an important feeding and staging for waterfowl. It is indefensible to lure them in to their death, esp. since this has been the historic use of the meadows unit since it was acquired.”

Response: As stated in this EA on page 34, to offset any negative impacts resulting from the competition of resources and habitat in time and space between hunters and wildlife, only designated hunting areas would be opened. Designated hunting areas would lessen the impact on these species while providing wildlife-dependent recreational opportunities to the public. The proposed hunting area was selected to provide a quality hunt to waterfowl hunters and refuge for harriers, migrating and wintering waterfowl, and other wildlife species. Designated hunt days would provide waterfowl with additional acreage for foraging and resting, and increase the number and diversity of waterfowl at the site.

Comment: A commenter opposed to the proposed action states “The precedent set by allowing hunting will, of course, lead to pressure to expand hunting to small game-again, in an area such creatures have sought as a refuge from human interference.”

Response: At this time there are no plans for the Refuge to initiate a small game hunt. However, if one were to be initiated, the Refuge would be required to comply with National Environmental Policy Act (NEPA) and the public would be asked for their comments.

Comment: A commenter opposed to the proposed action was concerned about the possible effects hunting could have on Bald Eagles.

Response: As stated on page 45 of the draft EA, the federally threatened species that utilize the Refuge included the piping plover and Bald Eagles. A Section 7 Evaluation was conducted in association with this assessment to allow 165 acres to be opened for hunting anywhere on the GMU as determined by administrative, public use, and biological reasons. It was determined that the proposed alternative would not likely adversely affect these endangered species.

Comment: The Refuge received 145 comments from individuals either supporting the proposed action or supporting the proposed action with modification to include opening the whole GMU to hunting, increase the number of days hunting is allowed or offering other hunting opportunities.

Response: The Service appreciates the support and believes that the proposed action strikes a good balance between different visitor uses and the needs of wildlife.

The HSUS FILED THE FOLLOWING COMMENTS

Comment: The HSUS states “The FWS simply cannot adequately analyze the impacts of its actions, including the cumulative impacts of expanding hunting on Refuges throughout the Refuge System under the NEPA, by employing such an approach.”

Response: The cumulative impacts for the proposed hunt program at the Refuge are presented in this EA, beginning on page 39.

Comment: The HSUS states “...the FWS is failing to provide adequate notice and opportunity to comment on its draft Sport Hunt Plans (SHPs) or EAs.”

Response: Notices were published in local newspapers on March 15, 2007, with a 30-day comment period. HSUS was sent a electronic copy of the Draft EA on March 14, 2007.

Comment: The HSUS states it did not receive the SHP or Draft EA within an adequate timeframe to prepare detailed comments on the proposals.

Response: In addition to the public the notice, a copy of the Draft EA was electronically sent to the HSUS on March 14, 2007.

Comment: The HSUS states the Service is not managing refuges primarily for the benefit of wildlife, because of recreational hunting.

Response: Legislation establishing the GMU (see page 5) allows the Service to provide opportunities for fish and wildlife-oriented recreation. A recreational waterfowl hunting program may be permitted if compatible with the purposes for which the Refuge was established. A Compatibility Determination which found waterfowl hunting compatible with the purposes of the Refuge was signed on January 19, 2005.

Comment: The HSUS states hunting often is not compatible with refuge purposes and negatively impacts non-consumptive uses. “As a result, allowing hunting “materially interfere[s] with and detracts from the non-consumptive priority uses of Refuges.”

Response: A Compatibility Determination which found waterfowl hunting compatible with the purposes of the Refuge was signed on January 19, 2005. As described on page 47 of the EA, the Refuge is in the process of opening an interpretive trail with viewing platforms at the GMU which will facilitate wildlife dependent recreation of photography, environmental education, interpretation, and wildlife observation. Areas designated as open to waterfowl hunting would be located away from any other public use areas. While the proposed hunting activity does not pose a public safety concern, some members of the public have indicated they would not visit the Refuge during hunt days. Limiting hunting to 3 days per week will provide ample hunt-free days and increase waterfowl viewing opportunities at the site. Opening the proposed designated area

within the GMU on designated days will provide visitors with a safe and enjoyable experience. The proposed action allows Refuge staff to re-adjust the hunting zone if public use problems arise.

Comment: The draft EA and SHP fail to show that the Service has complied with its obligation to “monitor the status and trends of fish, wildlife, and plants...”

Response: Comment noted.

Comment: The Service failed to show that funds to manage other uses are available, before adding recreational hunting.

Response: A Compatibility Determination which found waterfowl hunting compatible with the purposes of the Refuge also discussed the availability of funds to manage its hunt program.

Comment: HSUS looks forward to commenting on the Service’s draft hunting rules.

Response: Comment noted.

Comment: The Service is “...merely undertaking a haphazard, single-minded exercise so it can allow hunting...”

Response: As described in the Regulatory Compliance Section of this EA, the Service followed all federal laws, executive orders, and Service policies when developing the Refuge’s hunting program.

Comment: The Draft EA fails to analyze the cumulative impacts to the Refuge System as a whole.

Response: The cumulative effects analysis is found in this EA on pages 39 through 43.

Comment: The Service has not adequately explained why an Environmental Impact Statement (EIS) is not required.

Response: Please refer to the Finding of No Significant Impact.

Comment: The Service did not take a hard look at the impacts of hunting on refuges individually and as a whole system.

Response: The Service prepared the EA in consultation with the public and the appropriate resource agencies. The EA also included the cumulative impact analysis.

Comment: The Service must provide a cumulative impact analysis for hunting on the Refuge System as a whole.

Response: Comment noted.

Comments: The Service ignores the impacts to migratory birds from non-migratory bird hunting and the impacts of hunters on habitat.

Response: The hunting of non-migratory birds is not discussed in this draft EA

Comment: The Service relied on consultations under Section 7 of the Endangered Species Act when threatened and/or endangered species are present, instead of adequately analyzing impacts under NEPA.

Response: See Impacts to Threatened and Endangered Species on page 44-46 of this EA.

Comment: The Service may not narrow the purpose and need for hunting in order to make sport hunting the only alternative that meets the stated purpose. Stating that the proposed action is to allow hunting is not sufficient under NEPA.

Response: Comment noted.

Comment: The Service failed to adequately study, develop and describe alternative uses. Inclusion of the no action alternative alone does not create a reasonable range of alternatives.

Response: The draft EA addresses 3 alternatives.

Comment: The Service must consider alternatives that provide for non-lethal wildlife management.

Response: Alternative 1 is a non-lethal strategy for managing wildlife.

Comment: The HSUS asked the Service to consider and analyze a “Non-Consumptive Use” alternative in which resources were devoted to trail maintenance, wildlife monitoring, and other statutory duties.

Response: Comment noted.

Comment: The Service failed to meaningfully involve the public in its NEPA review process.

Response: Notices were published in the Connecticut Post on March 15, 2007. The documents were available for a 30-day review.

Comment: Section 7 Consultation under the Endangered Species Act must be completed.

Response: The Refuge completed an Intra-Service Section 7 Biological Evaluation of the Hunt Management Plan and EA.

Comment: The Service has compromised biological and ecological integrity by allowing sport hunting on refuges. The impacts of hunting on non-consumptive users have not been adequately addressed.

Response: As described on page 47 of the draft EA, the Refuge is in the process of opening an interpretive trail with viewing platforms at the GMU which will facilitate wildlife dependent recreation of photography, environmental education, interpretation, and wildlife observation. Areas designated as open to waterfowl hunting would be located away from any other public use areas. While the proposed hunting activity does not pose a public safety concern, some members of the public have indicated they would not visit the Refuge during hunt days. Limiting hunting to 3 days per week will provide ample hunt-free days and increase waterfowl viewing opportunities at the site. Opening the proposed designated area within the GMU on designated days will provide visitors with a safe and enjoyable experience. The proposed action allows Refuge staff to re-adjust the hunting zone if public use problems arise.

Comment: The Service has failed to recognize that the number of hunters has declined in the last few decades, missing out on opportunities to capitalize on potential economic gain that would come from non-consumptive users.

Response: Comment noted.

Comment: (1) The ability to manage deer at “natural” density levels to reduce impacts to vegetation is not realistic because no baseline vegetation information exists and the “...deleterious impacts of deer herbivory has not panned out in the long term.” (2) The primary justifications for bear hunting are that they lack natural predators to control populations and hunting reduces the chances of bear/human conflicts. (3) Hunting is not considered to be the primary reason for the decline in American woodcock numbers, but that does not prove that hunting is not a contributing factor. (4) Hunting would have a major negative effect on the unknown population levels of wild turkey at the refuge because of illegal take and disturbance of hens during the spring. Spring turkey hunts impact non-target wildlife during the breeding season when they are highly active.

Response: The EA does not discuss deer management, bear hunting, woodcock population numbers or wild turkey hunting.

Draft EA acknowledges that ducks would be harvested, but does not state which species. Several migratory bird species that potentially could be harvested are on the Game Birds Below Desired Condition list. The most inexpensive solution to declining populations is to remove them from the list of hunted species.

Response: The Service notes the comment. Also see the pages 39 through 43 of this EA for a discussion of migratory birds.

Comment: The Service claims that upland game species cannot be affected regionally by refuge hunting because of their limited home ranges.

Response: The Service notes the comment. Also see discussion of non hunted wildlife on pages 43-44 of this EA.

THE FOLLOWING COMMENTS ARE FROM SCI

Comment: SCI and states “We applaud the Service’s recognition of hunting as a priority use of the unit and as an essential wildlife management tool, both for the refuge and for the areas surrounding the refuge.”

Response: Comment noted.

Comment: SCI states “Surprisingly, the draft EA does not address the benefits to other wildlife species that a reduction of the Canada goose population may bring. SCI and SCIF suggest that the authors of Stewart B. McKinney NWR’s planning documents refer to the NEPA documents now being prepared by other refuges, such as those currently out for comment for hunting opportunities at Lake Umbagog NWR, for example. The draft EA prepared for Lake Umbagog NWR recognizes that, without Canada Goose hunting, the refuge could experience overgrazing that could degrade habitat for black ducks, green-winged teal and other ducks, as well as sora, Virginia rail, and other waterbirds. SCI and SCIF consequently suggest that the authors of the draft EA for Stewart B. McKinney NWR consider whether any resident or migratory waterfowl (or other wildlife species) that use refuge lands might similarly depend on the plants grazed by Canada Geese. If so, perhaps the refuge could consider amending Section V.B.2. a. and b. of the draft EA to reflect the benefits that hunting brings, explaining how the reduced populations of Canada geese could diminish overgrazing and consequently provide better habitat for species that rely on the plants on which the geese feed.

Response: Stewart B. McKinney NWR has not recorded the type overgrazing caused by Canada Goose and its possible effects on wildlife habitat as Lake Umbagog NWR. The Service does recognize the use of a recreational hunt as a proven wildlife management technique. The proposed alternative would allow the Refuge to use recreation hunting to control overgrazing on the Refuge. However, an amendment to the EA is not warranted.

Comment: The SCI also suggests that the draft EA feature more prominently the refuge’s consultation with the state fish and game agency and recommends that, in addition to noting the state’s concurrence with the Hunt Plan, that the EA add more of the state agency’s input about how hunting on the refuge assists with and/or is an element of the state’s efforts to manage state wildlife populations.

Response: The Service did consult with the State of Connecticut when preparing this EA. See Section VIII Consulting and Coordinating with Others.

