Appendix E

Freshwater pond on refuge

Wilderness Review of Monomoy National Wildlife Refuge

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Introduction

A wilderness review is the process the U.S. Fish and Wildlife Service (Service) uses to identify and recommend lands or waters in the National Wildlife Refuge System (Refuge System) for inclusion in the National Wilderness Preservation System (NWPS). Planning policy for the System (602 FW 3) mandates conducting wilderness reviews every 15 years through the Comprehensive Conservation Planning (CCP) process. Section 610 FW 4 of the Service's Wilderness Stewardship Policy provides guidance on the wilderness review process. We may also conduct a wilderness review prior to the next planning cycle, should significant new information become available, ecological or other conditions change, or we identify a need to do so.

The wilderness review process has three phases: inventory, study, and recommendation. After first identifying lands and waters that meet the minimum criteria for wilderness, the resulting wilderness study areas (WSA) are further evaluated to determine if they merit recommendation from the Service to the Secretary of the Interior to Congress for wilderness designation.

Areas recommended for designation are managed to maintain wilderness character in accordance with management goals, objectives, and strategies outlined in the final CCP until Congress legislatively designates an area or the CCP is amended to modify or remove the wilderness proposal. A brief discussion of wilderness inventory, study, and recommendation follows.

Wilderness Inventory

The wilderness inventory consists of identifying areas that minimally meet the requirements for wilderness as defined in the Wilderness Act of 1964 (Wilderness Act).

The definition of wilderness is in section 2(c) of the Wilderness Act: "A wilderness, in contrast with those areas where man and his works dominate the landscape, is hereby recognized as an area where the earth and its community of life are untrammeled by man, where man himself is a visitor who does not remain. In this act, an area of wilderness is further defined to mean an area of undeveloped federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions and which (1) generally appears to have been affected primarily by the forces of nature, with the imprint of man substantially unnoticeable; (2) has outstanding opportunities for solitude or a primitive and unconfined type of recreation; (3) has at least five thousand acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition; and (4) may also contain ecological, geological, or other features of scientific, educational, scenic, or historic value."

Wilderness Study

During the study phase, lands and waters qualifying for wilderness as a result of the inventory are studied to analyze values (ecological, recreational, cultural, or symbolic), resources (e.g., wildlife, water, vegetation, minerals, or soils), public uses, and refuge management activities within the area. The analysis includes evaluation of whether the WSA can be effectively managed to preserve its wilderness character.

An "All Wilderness Alternative" and a "No Wilderness Alternative" is analyzed for each WSA to compare the benefits and impacts of managing the area as wilderness as opposed to managing the area under an alternate set of goals, objectives, and strategies that do not involve wilderness designation. The environmental analysis addresses benefits and impacts to wilderness values and other resources under each management alternative. The study evaluates how each alternative will:

- Achieve the purposes of the Wilderness Act and the NWPS.
- Affect achieving refuge or planning unit purpose(s).
- Affect that refuge's contribution toward achieving the Refuge System mission.
- Affect maintaining and, where appropriate, restoring biological integrity, diversity, and environmental health at various spatial or landscape scales.
- Meet other legal and policy mandates.

The findings of the study help determine whether to recommend the area for designation as wilderness. The information, analysis, and decisions in the CCP and associated National Environmental Policy Act (NEPA) document (in this case an Environmental Impact Statement) provide the rationale for wilderness suitability determinations and the basic source of information throughout the public, executive, and legislative review processes that follow.

Wilderness Recommendation

There is no requirement to recommend a WSA for congressional designation as wilderness. The Final CCP and Record of Decision document the Service's determination on a WSA's suitability (or unsuitability) for wilderness and decision to recommend (or not recommend) an area for designation.

For a WSA determined suitable and recommended for designation, additional steps are required including preparing a wilderness study report that presents the results of the wilderness review and a Legislative Environmental Impact Statement. Once prepared, these documents are transmitted along with the CCP, through the Secretary of Interior to the President of United States, and ultimately to the United States Congress for approval.

Wilderness Inventory of Monomoy National Wildlife Refuge

The wilderness inventory is a broad look at the CCP planning area to identify potential WSAs. WSAs are roadless areas within the refuge boundaries that meet the minimum criteria for wilderness identified in Sect. 2. (c) of the Wilderness Act. A WSA must meet the minimum size criteria (or be a roadless island), appear natural, and provide outstanding opportunities for solitude or primitive recreation. Other supplemental values are evaluated, but not required.

The wilderness inventory phase was conducted and reviewed by the CCP Planning Team. Members of the planning team are Service personnel from the Regional Office and the field, the district manager of the Massachusetts Division of Fish and Wildlife, and representatives from the Mashpee Wampanoag Tribe and the Wampanoag Tribe of Gay Head (Aquinnah). The inventory process and application of the wilderness criteria is described in the following sections and summarized in table E.1.

Evaluation of Size Criteria

The initial step to identify roadless areas and roadless islands in a planning area requires gathering land status maps, land use and road inventory data, satellite imagery, aerial photographs, and personal observations of areas within refuge boundaries. Lands and waters currently owned by the Service in fee title are evaluated. "Roadless" refers to the absence of improved roads suitable and maintained for public travel by means of motorized vehicles primarily intended for highway use.

An inventory unit meets the size criteria for a WSA if any one of the following standards applies (610 FW 4.8):

- An area with over 5,000 contiguous acres. State and private lands are not included in making this acreage determination.
- A roadless island of any size. A roadless island is defined as an area surrounded by permanent waters or that is markedly distinguished from the surrounding lands by topographical or ecological features.
- An area of less than 5,000 contiguous Federal acres that is of sufficient size as to make practicable its preservation and use in an unimpaired condition, and of a size suitable for wilderness management.
- An area of less than 5,000 contiguous Federal acres that is contiguous with a designated wilderness, recommended wilderness, or area under wilderness review by another Federal wilderness managing agency such as the Forest Service, National Park Service, or Bureau of Land Management.

Discussion

Monomoy National Wildlife Refuge (NWR) stretches for 8 miles off the elbow of Cape Cod. The7,921-acre refuge includes the barrier islands of North Monomoy, South Monomoy and Minimoy, 40 acres on Morris Island

where the headquarters and visitor contact station are located, and waters out to the mean low water line around the Monomoy Islands. The refuge is one of eight refuges in the Eastern Massachusetts NWR Complex headquartered in Sudbury, MA.

All of the lands and waters within the refuge boundary are owned by the United States, and managed by the Service. The majority (86 percent) of the refuge's land and waters lying above Mean Low Water (MLW) were designated as wilderness in 1970. At that time, the wilderness designation was estimated to encompass 2,600 acres. With the exception of excluded areas, the Monomoy Wilderness boundary includes all lands extending to MLW within the original 1944 Declaration of Taking that established Monomoy NWR. Wilderness designation does not include subtidal or open water areas below MLW. The Monomoy Wilderness is currently the only nationally designated wilderness on the densely populated southern New England coastline.

The 1970 wilderness designation excluded four parcels: (1) the 40-acre property on Morris Island which contains the refuge headquarters and visitor contact station; (2) the approximately half-acre Stage Island lot; and (3) the Inward Point and (4) Powder Hole areas on South Monomoy. In the 1970 law, these latter areas are identified as 90 acres and 170 acres, respectively. However, the boundary description of these parcels conducted in 1971 and approved by the Regional Director identifies them as 73 acres and 137 acres, respectively.

In 2000, an updated survey of the refuge was completed by Service Regional Office surveyors who identified the refuge wilderness acreage to be 3,244 acres, the Inward Point exclusion as 432 acres and the Powder Hole exclusion as 163 acres. The sizes of the wilderness area and exclusions have both changed due to accretion. For the purposes of this review, we are using the numbers derived from the 2000 survey, which was approved in 2002 by the Service's Chief Surveyor.

The 432-acre Inward Point exclusion area includes the site of the former Monomoy Brant Club and seasonal camps described below. The 163-acre Powder Hole exclusion area includes the sites for the former Whitewash Village fishing community and U.S. Life Saving Service (and subsequently U.S. Coast Guard) Monomoy Point Lifesaving Station of which little evidence remains today. In addition, the Powder Hole exclusion area also includes the "cherry stem" access trail corridor and approximately 4-acre site of the existing Monomoy Point Light Station buildings, a National Historic Register designated site.

Although these two areas were excepted from the Wilderness designation, Congress intended the Secretary of the Interior to manage the entire area consistent with the concept of Wilderness (House of Representatives, Report No. 91-1441).

The wilderness inventory units which have been identified for this review are (1) the Morris Island/Stage Island unit; (2) the Inward Point unit; and (3) the Powder Hole unit, as shown on map E.1.

Conclusion

With the exception of the Morris Island portion, Monomoy NWR is once again surrounded by permanent waters and markedly distinguished from the surrounding lands by topographical or ecological features. It is also of sufficient size as to make practicable its preservation and use in an unimpaired condition. Additionally, the Inward Point unit and the Powder Hole units meet the size criteria as they are both contiguous to existing wilderness. The Morris Island/Stage Island unit is separated from the rest of the refuge by the Morris Island channel, and is therefore not contiguous with any designated wilderness.

Evaluation of the Naturalness Criteria

To qualify as a WSA, an area must meet the naturalness criteria (610 FW 4.9). Section 2 (c) of the Wilderness Act defines wilderness as an area that "…generally appears to have been affected primarily by the forces of nature with the imprint of man's work substantially unnoticeable." The area must appear "natural" to the average visitor rather than "pristine." The presence of ecologically intact, historic landscape conditions is not required.

An area may include some manmade features and human impacts provided they are substantially unnoticeable in the unit overall. In the inventory phase, the naturalness evaluation focuses on the *existing physical impacts* of refuge management activities, refuge uses, or human-caused hazards, such as the presence of unexploded

ordnance from military activity. At this stage, we do not disqualify an area from further study solely on the basis of established or proposed activities or uses that require the use of temporary roads, motor vehicles, motorized equipment, motorboats, mechanical transport, landing of aircraft, structures, and installations generally prohibited in designated wilderness. In addition, an area may not be considered unnatural in appearance solely on the basis of "sights and sounds" of human impacts and activities outside the boundary of the unit.

Discussion

Monomoy NWR and surrounding areas have a long history of human use. The vicinity of Chatham or "Manomoyick" was occupied by the Monomoyicks, a community of Native Americans of the federally recognized Wampanoag tribe. The Mashpee Wampanoag Tribe and the Wampanoag Tribe of Gay Head (Aquinnah) used the islands perhaps as early as 5,000 years ago and the area represented a local core of Native American settlement after A.D. 1500 (Steinitz and Loparto 1987). However, no Native American sites have been recorded on South Monomoy or North Monomoy. According to the archaeological site files on record with the Massachusetts Historical Commission, two Native American sites have been identified on the southern part of Morris Island, which is not in the current wilderness area. Native Americans likely visited the 8-mile peninsula from which the Monomoy barrier islands were later formed, but exposure to the elements and a lack of vegetation has meant that local landforms were subjected to extensive erosion and movement. As a result, Native American archaeological deposits may be deeply buried on the two islands, or may have been deflated by erosion, and no longer exist.

In the 1600s, European Americans settled in the communities of present day Cape Cod. In 1686, Captain James Forster purchased Morris Island, then known as "Quitnesset." The primary occupations were farming and maritime activities. The Town of Chatham was designated as the "constablewick of Monomoy" in 1696, during which time the Monomoy peninsula was being used as pasture for sheep and cattle.

By the early eighteenth century a small fishing community (later known as Whitewash Village) had been established on the peninsula. During the early 1800s, a deep natural harbor, known as Powder Hole, attracted a sizeable settlement at Whitewash Village. As many as 50 families maintained homes there and the village featured trading stores and a pair of shipyards. This community was largely abandoned after the deep harbor was filled with sediment following a hurricane in the latter half of the 19th century, and hindered the fishing that had sustained the local economy. At its peak, Whitewash Village housed about 200 residents and featured a public school and an inn, the Monomoit House. Little evidence of the historic Whitewash Village exists on the ground surface. Historical deposits and features have likely been subject to erosion, but no formal study has been conducted to map and inventory historic or archaeological resources at the refuge.

The first Monomoy Point Lighthouse was built in 1823. The U.S. Life-Saving Service was authorized to build several lifesaving stations on outer Cape Cod, including the Monomoy peninsula in 1872. A second lifesaving station (Monomoy) was built near Hospital Pond 2 years later, and a third at Monomoy Point in 1902 served as the southernmost component in a series of 13 stations between Chatham and Provincetown (Seufert-Barr 1995). The Morris Island and the Monomoy Point stations transferred to the U.S. Coast Guard in 1915 when the Coast Guard replaced the Life-Saving Service. The Morris Island Coast Guard facility became the current site for the Monomoy NWR administrative headquarters and visitor contact station. The Coast Guard transferred use and management of their remote and difficult to access Morris Island and Stage Island facilities to the U.S. Fish and Wildlife Service following refuge establishment in 1944.

By the early 1900s, the Monomoy peninsula became a popular holiday destination where families built summer camps and waterfowl hunters visited during the fall and winter. The elite Monomoy Brant Club brought sportsmen to the remote beach near Inward Point for waterfowl hunting from 1862 to 1932, at which time the U.S. Military took over the peninsula. Remains of the Brant Club structures persisted through the mid-1950s after which a series of coastal storms destroyed the buildings, leaving behind little evidence of their prior existence.

The refuge (and existing Monomoy Wilderness) includes an area previously known as the Monomoy Island Gunnery Range. The military used the island for aerial bombardment and gunnery range from 1944 through 1950 with evidence of the munitions used still found from time to time.

In the mid-1950s dredge spoil was placed across the cut separating Morris and Stage Islands from mainland

Chatham after a storm deepened the cut but also began filling Stage Harbor with sand. This new "causeway" was paved in the late 1960s, affording all weather motor vehicle access, after which Morris and Stage Islands were "built out" for the residential land use that now surrounds and immediately adjoins existing Monomoy NWR facilities on these islands.

The Morris Island tract contains several buildings and parking areas, as well as a disjunct parcel comprised of salt marsh, small ponds, dunes and beach. The Morris Island Trail traverses this parcel; interpretative exhibits are found along the trail. The Stage Island lot is primarily a parking area and boat loading and unloading area.

The Inward Point area is now free of most permanent or manmade structures, as all the camps that were located in this area when the original wilderness was designated have now been removed. A building foundation and cistern and utility poles do remain. The Powder Hole area contains the historic Monomoy Point Light Station complex. These are the only buildings remaining on South Monomoy and include a lighthouse, a keeper's house, and former oil shed.

Conclusion

The residential land use and roads that surround or immediately adjoin Monomoy NWR lands on Morris and Stage Islands, and their close proximity to the high density development of mainland Chatham, detract from the natural characteristics and fail to satisfy the naturalness criteria for wilderness for this northernmost portion of Monomoy NWR.

Elsewhere, extant buildings and the remains of other structures such as concrete building foundations, water cisterns, and utility poles are signs of past human occupation and still serve as reminders that neither the Powder Hole nor the Inward Point non-wilderness areas have yet attained a primeval, undeveloped and natural condition.

Both the Inward Point and Powder Hole non-wilderness areas exhibit subtle but steadily diminishing evidence of the imprint of man and past habitation, since removal of the buildings on them. The overall impression is one of trending toward naturalness that may in time meet the criteria for naturalness. When on South Monomoy Island, one cannot visually tell when entering or leaving the Monomoy Wilderness surrounding the Inward Point non-wilderness area. When in the Powder Hole non-wilderness area, the historic Monomoy Point Light Station stands out as a clearly unnatural landscape feature, and other remains of past human occupation and motor vehicle use are commonly encountered. Stabilization and historic restoration of the light station buildings began in 2010, with exterior renovations substantially completed in 2012. These renovations were conducted because of the National Register status of the structures. Similar periodic in situ maintenance of the historic light station structures may require future periodic mechanized or motorized transport and equipment use and access to the worksite through the Monomoy Wilderness.

Evaluation of Outstanding Opportunities for Solitude or Primitive Recreation

In addition to meeting the size and naturalness criteria to qualify as a WSA, an area must provide outstanding opportunities for solitude or primitive recreation (610 FW 4.10). The area does not have to possess outstanding opportunities for both solitude and primitive recreation, and does not need to have outstanding opportunities on every acre. Further, an area does not have to be continuously open to public use and access to qualify under these criteria. Congress has designated a number of Refuge System wilderness areas that are closed to public access to protect ecological resource values.

Opportunity for solitude refers to the ability of a visitor to be alone and secluded from other visitors in the area. Primitive and unconfined recreation means nonmotorized, dispersed outdoor recreation activities that do not require developed facilities or mechanical transport. These primitive recreation activities may provide opportunities to experience challenge and risk, self-reliance, and adventure.

These two opportunity "elements" are not explicitly defined by the Wilderness Act but in most cases can be expected to occur together. However, an outstanding opportunity for solitude may be present in an area offering only limited primitive recreation potential. Conversely, an area may be so attractive for recreation use that experiencing solitude is not an option.

Discussion

The Morris Island/Stage Island area provides very limited opportunities to experience solitude or participate in primitive recreation. The Stage Island lot is closed to the public—it is a small lot surrounded by residential dwellings. The Morris Island parcel includes a public parking area, staff parking, a dormitory and maintenance shop, restrooms, and the refuge headquarters and visitor contact station. It is accessible by motor vehicles and receives over 30,000 visitors annually primarily from April to October. The Morris Island Interpretive Trail encompasses much of this parcel. It brings visitors to the beach, which can be heavily used by sunbathers, anglers, and dog walkers. Opportunity for solitude is largely confined to the colder months (November to March) when tourism is lower, but is still significant.

The Inward Point and the Powder Hole non-wilderness areas on South Monomoy are accessible only by boat. Although substantial motorized boating traffic is evident seasonally in the waters surrounding South Monomoy Island, boat traffic decreases progressing southward with increasing distance from mainland ports. The widening of the South Monomoy landmass around Monomoy Point along with the increased distance from mainland development and boating concentrations contribute to a greater opportunity for solitude and primitive recreation for wilderness users of interior reaches near South Monomoy's southern tip. The Monomoy light station, located within the Powder Hole area, does attract visitors, including occasional organized tours. There is a designated boat landing site at or near the northwestern edge of this non-wilderness area. Anglers and shell fishermen can be found in the intertidal areas of the Inward Point non-wilderness area.

Primitive recreation activity is currently confined to daylight hours (½ hour before sunrise to ½ hour after sunset), and is expected to remain so to protect disturbance-sensitive wildlife species. No overnight camping is allowed anywhere on the refuge. The only overnight activity permitted is saltwater angling from shore on the Morris Island portion of Monomoy NWR. There may be some seasonal closures to protect wildlife in the Inward Point and Powder Hole non-wilderness areas, but most of the refuge is open year round to visitors.

Conclusion

The Morris and Stage Island inventory unit does not provide meaningful or consistent opportunities for solitude or primitive recreation. Overall, both the Inward Point and (especially) Powder Hole non-wilderness areas meet the solitude and primitive and unconfined recreation criteria for wilderness. Both inventory units offer potential for outstanding opportunities for solitude or primitive forms of outdoor recreation.

Supplemental Values

The Wilderness Act defines supplemental values as "ecological, geological, or other features of scientific, educational, scenic, or historic value."

Discussion

Monomoy NWR is a vital and unique habitat for migratory birds along the Atlantic flyway and provides a diversity of habitat for passerines, raptors, waterfowl, and seabirds. Four federally listed endangered and threatened species (piping plover, roseate tern, northeastern beach tiger beetle, and red knot) are found on the refuge. Piping plovers are found in the Morris Island, Inward Point and Powder Hole non-wilderness areas; northeastern beach tiger beetles are also present in close proximity to the Inward Point inventory unit on its east side.

Monomoy NWR has been recognized as a Western Hemisphere Shorebird Reserve Network regional site and an Important Bird Area due to its importance to migratory shorebirds. The refuge also is a designated Marine Protected Area. Monomoy refuge's beaches provide valuable spawning habitat for horseshoe crabs, which can be found in the intertidal waters of all three inventory units. The refuge is the largest grey seal haulout site along the Atlantic seaboard, and seals can be commonly found hauled out on the east side of the Inward Point and Powder Hole inventory units. Much of the habitat in the three inventory units is maritime grassland with inclusions of maritime shrubland, which is considered rare in Massachusetts and is characterized by patches of dense shrubs with scattered more open areas of low growth or bare ground. The areas of maritime beach strand community and maritime dune community on the refuge are also considered rare in Massachusetts.

Scientific interest, such as research on coastal wildlife and fish, their habitats, and the geologic and hydrologic processes—especially in the face of global climate change and sea level rise—and potential offshore renewable energy development, is ongoing and expected to continue at Monomoy NWR in the foreseeable future.

Monomoy NWR is one of the few areas remaining where natural, dynamic, coastal barrier system geological processes still proceed largely unimpaired by man. Coastal engineering to retard erosion, such as rock armoring and beach nourishment, and dredging to maintain navigability of waterways, has already impacted Morris and Stage Islands.

Visitors are drawn to the Cape Cod region and Monomoy in particular for the scenic and historic values. Guided natural history tours with an educational focus by groups from Cape Cod Museum of Natural History, Massachusetts Audubon Society, university and school groups, and the Friends of Monomoy NWR have been, and are expected to remain, popular at Monomoy NWR.

Monomoy NWR also has significant cultural and historic supplemental values, including the Monomoy Point Light complex listed on the National Register of Historic Places.

Conclusion

All three inventory units provide supplemental wilderness values, with the Morris Island/Stage Island units providing less supplemental value than the Inward Point and Powder Hole inventory areas.

The Monomoy NWR (map E.1) was evaluated to determine suitability for designation, management, and preservation as wilderness (610 FW 4.13). Considerations in this evaluation included:

- Quality of wilderness values.
- Capability for management as wilderness (manageability) and minimum requirements/tool analysis.

This information provides a basis to compare the impacts of a range of management alternatives and determines the most appropriate management direction for each WSA.

Summary/Conclusion of Wilderness Inventory Phase

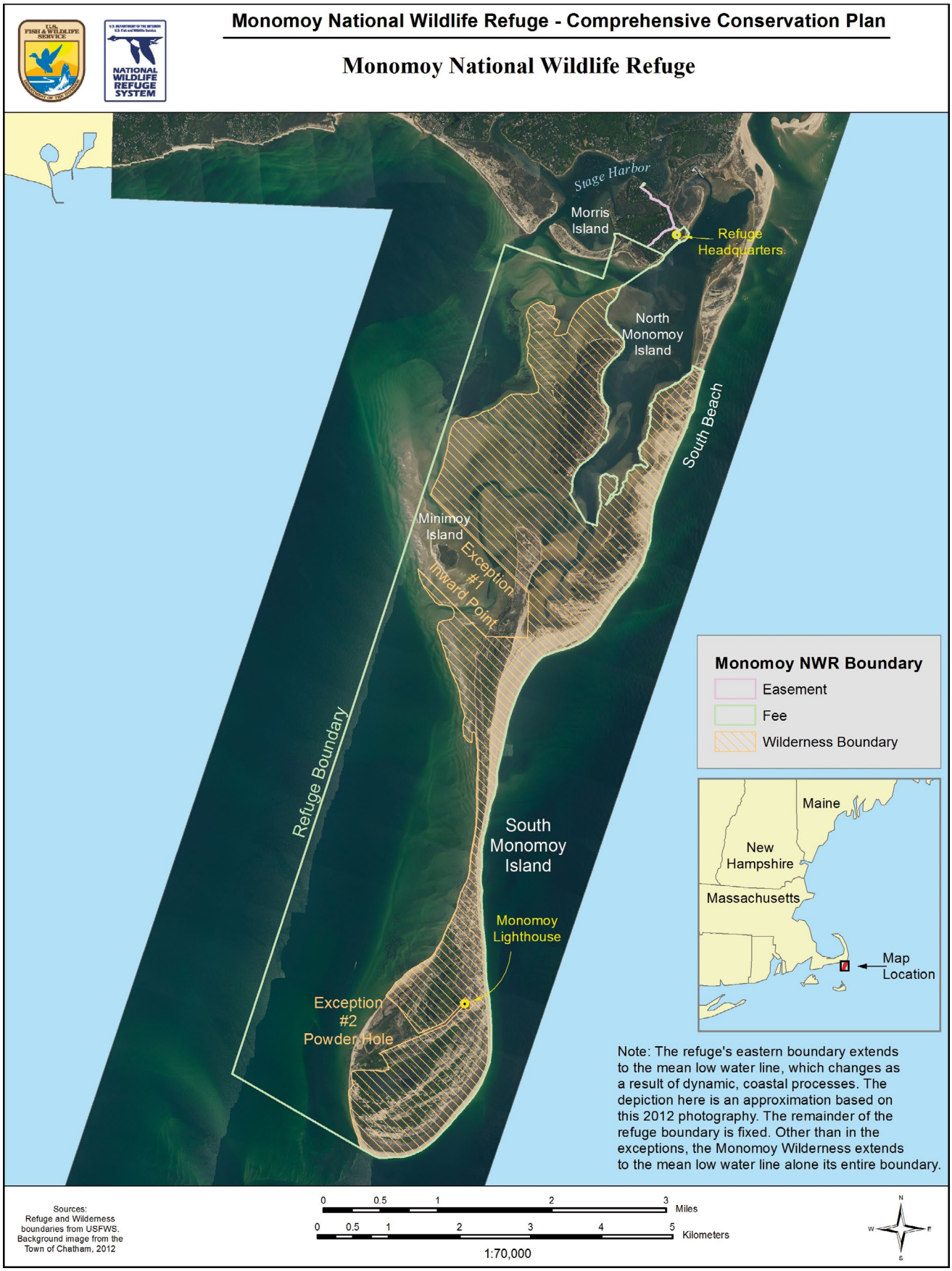
Table E.1 summarizes the quality of the three inventory units currently in a non-wilderness status for mandatory and supplemental wilderness characteristics. None of the three current non-wilderness portions of South Monomoy excluded from wilderness designation in 1970 yet meet the eligibility criteria for further detailed study as WSAs as defined by the Wilderness Act during the 15-year plan period.

The Morris Island/Stage Island inventory unit does not and is unlikely ever to meet the size criteria for wilderness. The residential land use and roads that surround or immediately adjoin refuge lands on Morris and Stage Islands and their close proximity to the high density development of mainland Chatham detract from the natural characteristics and fail to satisfy the naturalness criteria for wilderness for this northernmost portion of Monomoy NWR. The Morris and Stage Island inventory unit provides very limited opportunity to experience solitude or participate in primitive recreation due to accessibility by motor vehicles and proximity to concentrated human activity on the mainland shorelines, especially in light of the small acreage the Service manages.

Elsewhere, although the existing imprints of man are diminishing, evidence of past human occupation and use still exists, standing out as obvious detractors from the natural characteristics of the refuge. This especially pertains to the historic Monomoy Point Light complex structures located in the Powder Hole inventory unit. Remnants of old roadways and motor vehicles, building foundations or pilings, cisterns, and utility poles remain evident. On the whole, both the Inward Point and the Powder Hole inventory units do not yet appear to have been affected primarily by the forces of nature and do not yet meet the naturalness criteria for wilderness designation.

Table E.1. Wilderness Inventory Area Findings Summary for Monomoy NWR.

Refuge unit and acreage	(1) has at least 5,000 acres of land or is of sufficient size to make practicable its preservation and use in an unconfined condition, or is a roadless island;	(2) generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable;	(3a) has outstanding opportunities for solitude;	(3b) has outstanding opportunities for a primitive and unconfined type of recreation;	(4) contains ecological, geological or other features of scientific, educational, scenic, or historical value.	Parcel qualifies as a wilderness study area (meets criteria 1, 2, and 3a or 3b)
Morris and Stage Island	No	No	Seasonal only	No	Yes	No
Inward Point	Yes, the area is now a roadless island, although formerly roaded and accessible by motor vehicle.	No	Yes	Yes, for daytime recreation.	Yes, the diversity of waterbirds, shorebirds, rare maritime habitat, as well as barrier beach geology feature scientific, educational, scenic, and cultural and historic values.	No
Powder Hole	No. Evidence or former roads and motor vehicle use still apparent but diminishing.	No. Existing structures and access trails for the Monomoy Point. Lighthouse complex listed on the National Register of Historic Places.	Yes	Yes, for daytime recreation.	Yes, the diversity of waterbirds, shorebirds, rare maritime habitat, as well as barrier beach geology feature scientific, educational, scenic, and cultural and historic values.	No


Monomoy National Wildlife Refuge - Comprehensive Conservation Plan
Monomoy National Wildlife Refuge
Stage Harbor
Morris Island
Refuge Headquarters
North Monomoy Island
South Beach
Minimoy Island
Exception #1
Inward Point
Refuge Boundary
South Monomoy Island
Monomoy Lighthouse
Exception #2
Powder Hole
Monomoy NWR Boundary
Easement
Fee
Wilderness Boundary
Maine
New Hampshire
Massachusetts
Map Location
Note: The refuge's eastern boundary extends to the mean low water line, which changes as a result of dynamic, coastal processes. The depiction here is an approximation based on this 2012 photography. The remainder of the refuge boundary is fixed. Other than in the exceptions, the Monomoy Wilderness extends to the mean low water line alone its entire boundary.
Sources: Refuge and Wilderness boundaries from USFWS. Background image from the Town of Chatham, 2012
0 0.5 1 2 3 Miles
0 0.5 1 2 3 4 5 Kilometers
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W
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Wilderness Study and CCP Alternatives for Monomoy NWR

Since the wilderness inventory phase determined that none of the three inventory units yet possess wilderness character sufficient for WSA designation, the wilderness study and recommendation phases of the Wilderness Review were not undertaken as part of this CCP cycle.

Another wilderness review in 15 years as part of the next planning cycle will reconsider WSA designation and the wilderness study and recommendation phases for the Inward Point and Powder Hole inventory units, but not the Morris Island/Stage Island inventory unit. All CCP alternatives must manage the existing Monomoy Wilderness to simultaneously secure both an enduring resource of wilderness and accomplish refuge purposes in a way that preserves wilderness character. We will also continue managing and the Inward Point and Powder Hole (currently non-wilderness) inventory units through the 15-year plan period to maintain their size, naturalness, and outstanding opportunities for solitude or primitive and unconfined recreation, to the extent that it will not prevent us from fulfilling and carrying out refuge establishing purposes and the Refuge System mission, in accord with Service wilderness stewardship policy (610 FW). We may also conduct a wilderness review prior to the next planning cycle, should significant new information become available, ecological or other conditions change, or we identify a need to do so.

E.2 Wilderness Stewardship Plan Outline (See 610 FW 3, Exhibit 1)

I. **Introduction**

a. Wilderness establishment, including contents of pertinent laws, date(s) of establishment, boundary or other legal changes, pertinent committee report discussion, and special provisions.

b. Goals and objectives for the wilderness area and its relationship to the refuge's purposes and Refuge System mission and goals, including protection of the air-quality-related values of Class I wilderness areas.

II. **Description of the Wilderness Area**

a. Legal and narrative description of the area.

b. Map displaying Service refuge boundary, wilderness area boundary, and other relevant legal, administrative, and natural boundaries.

c. A description of the baseline wilderness resource condition existing at the time of designation as well as current wilderness resource conditions, including a description of the wilderness area, natural conditions, cultural resources and values, stewardship activities, existing facilities, and public use levels and activities.

III. **Interagency and Tribal Coordination and Public Involvement.** Description of coordination with States, other Federal agencies, and tribes. Description of public involvement activities and a summary and analysis of comments received and how the plan responds to them.

IV. **Stewardship**

a. Description of stewardship strategies (administrative, natural and cultural resources, public recreation, interpretation and education, and commercial services) required to adequately administer the area.

b. Minimum requirement analyses and documentation of NEPA compliance for all refuge management activities and commercial services necessary to administer the area.

c. Descriptions of how we will manage existing private rights, existing rights-of-way, activities associated with valid mineral rights, and congressionally authorized uses to protect wilderness values.

d. An explanation of how we will coordinate with adjoining wilderness units so that the wilderness character and natural and cultural resources and values are managed in a complementary manner that minimizes impediments to visitors traveling from one wilderness area to another.

V. **Research.** Description of any past and current research and identification of research needs. Includes necessary appropriateness and compatibility determinations, minimum requirements analysis, and relevant partnership, funding, and staffing requirements.

VI. **Funds and Personnel.** A discussion of staff and funds needed to administer the wilderness.

VII. **Monitoring.** To determine if we are meeting our wilderness stewardship objectives and other refuge management objectives in wilderness, identify: monitoring requirements; associated protocols; partnership, funding, and staffing needs; indicators of change in resource conditions; standards for measuring that change; and desired conditions or thresholds that will trigger management actions to reduce or prevent impacts on the wilderness.

VIII. **Implementation Schedule.** A schedule of implementation, prioritization of action items, staff assignments, and funding requirements to adequately administer the area.

IX. **Appropriateness and Compatibility Determination**

X. **Review and Approval**

XI. **Appendix**

a. A copy of the legislation establishing, modifying the boundary of, or making other changes to the wilderness.

b. Wilderness study report for the wilderness.

c. NEPA documentation

d. Public hearing record from the wilderness study and record of review of comments received from States, other Federal agencies, tribes, and the public.

e. Congressional hearing record.

f. Congressional committee report accompanying the authorizing legislation.

E.3 Minimum Requirements Analyses Alternatives Matrix

The matrix that follows identifies management activities, by CCP alternative, that may be expected to take place within the Monomoy Wilderness (with any recommended additions) based upon the strategies and monitoring elements listed in chapter 3. Management activity-alternative combinations marked with a "Y" in the matrix are those that minimum requirements analyses must address prior to, or during, development of the Wilderness Stewardship Plan.

Management Activity within Monomoy Wilderness	Alternative A	Alternative B	Alternative C
Temporary Field Camp	**Y**	**Y**	**N**
Boating/Paddling Landing/Anchoring Watercraft	**Y**	**Y**	**Y**
Artificial Wildlife Structures			
• Nest platforms	**Y**	**Y**	**N**
• Dredge material disposal/dredging/beach renourishment	**Y**	**Y**	**N**
• Decoys/broadcast ROST calls	**Y**	**Y**	**Y**
• Artificial eggs/incubation	**Y**	**Y**	**Y**
Wildlife/Resource Inventory & Monitoring			
• Nest census survey	**Y**	**Y**	**Y**
• Nest productivity	**Y**	**Y**	**N**
• Camera traps/motion sensors	**Y**	**Y**	**Y**
• Blinds	**Y**	**Y**	**N**
• Seals	**Y**	**Y**	**N**
• Shorebird banding – cannon nets	**Y**	**Y**	**Y**
• Horseshoe crab spawning survey and tagging	**N**	**N**	**N**
• Sharks	**N**	**N**	**N**
Predator Management			
• Lethal predator control	**Y**	**Y**	**Y**
• Blinds	**Y**	**Y**	**N**
• Predator exclosures at nests	**Y**	**Y**	**Y**
• Electric fence	**Y**	**Y**	**N**
• Chick shelters	**Y**	**Y**	**N**
• Blinds	**Y**	**Y**	**N**
• Camera traps/motion sensors	**Y**	**Y**	**Y**
Vegetation/Habitat Management			
• Tern colony – prescribed burn	**Y**	**Y**	**Y**
• Invasive (non-native) plants	**Y**	**Y**	**Y**
Signage/Navigational Aids			
• Area seasonal closures – symbolic fencing	**Y**	**Y**	**Y**
• Boat landings/wilderness entry points	**Y**	**Y**	**Y**
• Maritime navigational aids	**N**	**N**	**N**
• Wilderness boundary marking	**Y**	**Y**	**Y**
Cultural/Historic Resource Protection			
• Shipwrecks	**Y**	**Y**	**Y**
• Historic light station access for preservation or mitigation	**Y**	**Y**	**Y**
Coastal Change/SLR Monitoring	**Y**	**Y**	**Y**

ARTHUR CARHART NATIONAL WILDERNESS TRAINING CENTER

MINIMUM REQUIREMENTS DECISION GUIDE

WORKSHEETS

Piping Plover Management in Monomoy Wilderness

". . . except as necessary to meet minimum requirements for the administration of the area for the purpose of this Act..."

– the Wilderness Act, 1964

Step 1: Determine if any administrative action is necessary.

Description: Briefly describe the situation that may prompt action.

In 2011, 41 piping plover pairs (threatened) nested on South Monomoy within the refuge boundary, and 85 percent of those nested within the Monomoy Wilderness. Several different management actions are required to enhance plover productivity within the Monomoy Wilderness. Through seasonal closures and predator management actions, Monomoy NWR seeks to maintain at least 1.24 chicks fledged per pair annually, and a mean of at least 1.5 chicks fledged per pair over a 5-year period, consistent with Piping Plover Recovery Plan criteria. Monomoy NWR strives to support 10 percent of the State's annual nesting population, averaged over a 5-year period. Predation (both avian and mammalian) is an important factor limiting piping plover nest productivity. Gulls are opportunistic plover nest and chick predators, and thrived during the 1960s to 1990s coincidental with rapid human development and the unlimited food supply humans represented. Gulls reached and remained at unnaturally high regional population levels. In the early 1970s, the (larger) eastern coyote immigrated to Cape Cod and the Monomoy area, adapting readily to human-induced landscape changes and exploiting a void created when other large mammalian predators were extirpated. Piping plovers in the region have not yet fully developed effective defenses against this once foreign but now resident predator. Coyotes are able to negotiate the mainland to South Monomoy for nightly round trips via the 2006 land bridge. Piping plovers (threatened) require protection under the Endangered Species Act. All high quality piping plover nesting and nearby foraging habitat on Monomoy National Wildlife Refuge is protected from disturbance and degradation.

To determine if administrative action is necessary, answer the questions listed in A–F on the following pages.

A. Describe Options Outside of Wilderness

Is action necessary within wilderness?

Yes: ☒ **No:** ☐

Explain:
On Monomoy NWR, 85 percent of piping plover pairs nests within the Monomoy Wilderness. Piping plover recovery will not be achieved without seasonal closures, population monitoring, and predator management within the Monomoy Wilderness, given that such a large proportion of plover nesting occurs within wilderness.

The U.S. Fish and Wildlife Service is responsible for protecting and assisting in the recovery of federally listed threatened and endangered species, such as the piping plover, under the ESA. The Service is charged with the responsibility for managing (threatened) piping plovers in accordance with the species recovery plan, including those that nest within or adjacent to the Monomoy Wilderness.

B. Describe Valid Existing Rights or Special Provisions of Wilderness Legislation

Is action necessary to satisfy valid existing rights or a special provision in wilderness legislation (the Wilderness Act of 1964 or subsequent wilderness laws) that allows consideration of the Section 4(c) prohibited uses? Cite law and section.

Yes: ☐ **No:** ☒ **Not Applicable:** ☐

Explain:
No special provisions are included in P.L 91-504, the 1970 Wilderness Act, establishing the Monomoy Wilderness and there are no remaining valid existing rights.

C. Describe Requirements of Other Legislation

Is action necessary to meet the requirements of other laws?

Yes: ☒ **No:** ☐ **Not Applicable:** ☐

Explain:
The refuge was established in 1944 pursuant to the Migratory Bird Conservation Act (16 U.S.C. § 715d) through a Declaration of Taking (United States vs. Commonwealth of Massachusetts, and Susie H. Kosak et al, Miscellaneous Civil No. 6340, District Court of Massachusetts) "… for use as an inviolate sanctuary, or for other management purpose, for migratory birds" and "…for the protection during the nesting season or while on their way to and from their breeding grounds…" with an emphasis on threatened, endangered, and migratory birds.

The Endangered Species Act of 1973 (16 U.S.C 1531-1544), as amended directs the Department of the Interior to identify those species of plants and animals listed as threatened, endangered, or candidates, and develop and implement plans and programs to ensure their continued survival into the future.

The piping plover is a migratory bird listed as threatened under the ESA. Piping plover *(Charadrius melodus)* nest productively and in high density along the South Monomoy beaches. Human disturbance during the critical nesting and brood rearing season can easily result in "take" under ESA provisions.

The National Wildlife Refuge System Improvement Act of 1966, as amended by the Wildlife Refuge System Improvement Act of 1997 (16 U.S.C 668dd-ee) directs the U.S. Fish and Wildlife Service "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." The Monomoy Wilderness lies entirely within the Monomoy National Wildlife Refuge, a unit of the National Wildlife Refuge System.

D. Describe Other Guidance

Is action necessary to conform to direction contained in agency policy, unit and wilderness management plans, species recovery plans, or agreements with tribal, state and local governments or other Federal agencies?

Yes: ☒ **No:** ☐ **Not Applicable:** ☐

Explain:
The primary objective of the Atlantic Coast Piping Plover Recovery Plan (USFWS 1996) is to remove the piping plover (*Charadrius melodus*) population from the List of Endangered and Threatened Wildlife and Plants by (1) achieving well-distributed increases in numbers and productivity of breeding pairs, and (2) providing for long-term protection of breeding and wintering plovers and their habitat. The recovery plan strategies provide for the long-term viability of piping plover populations in the wild. The beach and dune edges provide vital breeding habitat for the piping plover, which nest in the beach berm and associated dune edge and washover areas, and forage on nearby intertidal flats. Monomoy NWR, including the Monomoy Wilderness, supports more than 40 nesting pairs of piping plovers.

Policy on Maintaining Biological Integrity, Diversity and Environmental Health (601 FW 3)—This policy provides guidance on maintaining or restoring the biological integrity, diversity, and environmental health of the Refuge System, including the protection of a broad spectrum of fish, wildlife, and habitat resources in refuge ecosystems. It provides refuge managers with a process for evaluating the best management direction to prevent the additional degradation of environmental conditions and restore lost or severely degraded environmental components. It also provides guidelines for dealing with external threats to the biological integrity, diversity, and environmental health of a refuge and its ecosystem. In recognition of Monomoy NWR's role as an avian diversity reservoir, the refuge was designated as a Western Hemisphere Shorebird Reserve Network (Regional) site under the auspices of the WHSRN Hemispheric Council, and an Important Bird Area (IBA) by the Audubon Society. The wetland complex and the non-wilderness beach berm, dune edges and washover areas extending northward from the Powder Hole into the Monomoy Wilderness contribute much toward local and regional biotic integrity, diversity, and environmental health.

E. Wilderness Character

Is action necessary to preserve one or more of the qualities of wilderness character including: untrammeled, undeveloped, natural, outstanding opportunities for solitude or a primitive and unconfined type of recreation, or unique components that reflect the character of this wilderness area?

Untrammeled: **Yes:** ☐ **No:** ☒ **Not Applicable:** ☐

Explain:

Undeveloped: **Yes:** ☐ **No:** ☒ **Not Applicable:** ☐

Explain:

Natural: **Yes:** ☒ **No:** ☐ **Not Applicable:** ☐

Explain:
Habitat and population management is necessary to maintain native species ecologically adapted to Monomoy NWR, including the Monomoy Wilderness, thus preserving and improving the naturalness of the Monomoy Wilderness.

Outstanding opportunities for solitude or a primitive and unconfined type of recreation:

Yes: ☒ **No:** ☐ **Not Applicable:** ☐

Explain:
Preserving and enhancing nesting piping plovers preserves outstanding opportunities to observe and photograph this native species in its natural habitat.

Other unique components that reflect the character of this wilderness:

Yes: ☒ **No:** ☐ **Not Applicable:** ☐

Explain:
Piping plovers contribute to the biotic diversity and integrity of the Monomoy Wilderness and to the unique scientific and ecological values of the area.

F. Describe Effects to the Public Purposes of Wilderness

Is action necessary to support one or more of the public purposes for wilderness (as stated in Section 4(b) of the Wilderness Act) of recreation, scenic, scientific, education, conservation, and historical use?

Recreation: **Yes:** ☐ **No:** ☒ **Not Applicable:** ☐

Explain:
Action is not necessary to support the recreation public purpose because recreational opportunities will remain as they are.

Scenic: **Yes:** ☐ **No:** ☒ **Not Applicable:** ☐

Explain:

Scientific: **Yes:** ☒ **No:** ☐ **Not Applicable:** ☐

Explain:
As one of the few existing, relatively undisturbed, nesting piping plover populations, the Monomoy piping plovers provide an important scientific benchmark; further study of the Monomoy population could add to the scientific piping plover knowledge base. Improved scientific understanding about piping plovers and their management can improve nest productivity and rangewide population recovery.

Education: **Yes:** ☐ **No:** ☒ **Not Applicable:** ☐

Explain:

Conservation: **Yes:** ☒ **No:** ☐ **Not Applicable:** ☐

Explain:
This action helps conserve a federally threatened species. Piping plover population management performed within the Monomoy Wilderness adds to the population, thereby improving prospects for species recovery and long-term population persistence.

Historical use: **Yes:** ☐ **No:** ☒ **Not Applicable:** ☐

Explain:

Step 1 Decision: **Is any administrative action necessary in wilderness?**

Yes: ☒ **No:** ☐ **Not Applicable:** ☐

Explain:
Actions providing nesting habitat, minimizing predation and human disturbance, and conducting monitoring to protect and restore piping plover on Monomoy NWR, including the Monomoy Wilderness, are necessary to achieve the migratory bird conservation purpose for which Monomoy Refuge was established in 1944; to satisfy requirements of other legislation, agency policy, and guidance; to preserve wilderness character; and to achieve the other public purposes for wilderness.

Action is necessary within the Monomoy Wilderness "…for the protection during the nesting season or while on their way to and from their breeding grounds…" of the migratory piping plover. Typically, 85 percent of Monomoy's piping plovers nest within the Monomoy Wilderness. The piping plover is also listed as threatened under the Endangered Species Act of 1973 (16 U.S.C 1531-1544). Piping plover recovery as defined in the Atlantic Coast Piping Plover Recovery Plan will not be achieved without seasonal closures, population monitoring, and predator management within the Monomoy Wilderness, given that such a large proportion of plover nesting occurs within wilderness. Piping plover (Charadrius melodus) nest productively and in high density along the South Monomoy beaches. Human disturbance during the critical nesting and brood rearing season can easily result in violating Endangered Species Act "take" provisions. Action is necessary within the Monomoy Wilderness to fulfill the National Wildlife Refuge System Improvement Act of 1966, as amended by the Wildlife Refuge System Improvement Act of 1997 (16 U.S.C 668dd-ee), directing the U.S. Fish and Wildlife Service "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." Action is also necessary within the Monomoy Wilderness to fulfill Service Policy on Maintaining Biological Integrity, Diversity and Environmental Health (601 FW 3), including the protection of a broad spectrum of fish, wildlife, and habitat resources in refuge ecosystems.

Action is necessary to preserve naturalness and outstanding opportunities for unconfined wildlife observation and photography within the Monomoy Wilderness by conserving piping plovers in their natural habitat. As one of the few relatively undisturbed nesting piping plover populations, the Monomoy piping plovers provide an important scientific benchmark, and further study of the Monomoy population could add to the scientific piping plover knowledge base. Improved scientific understanding about piping plovers and their management can improve nest productivity and prospects for regional and rangewide population recovery.

If action is necessary, proceed to Step 2 to determine the minimum activity.

Step 2: Determine the minimum activity.

Please refer to the accompanying Minimum Requirements Decision Guide *Instructions* **for an explanation of the effects criteria displayed below.**

Description of Alternatives

For each alternative, describe what methods and techniques will be used, when the activity will take place, where the activity will take place, what mitigation measures are necessary, and the general effects to the wilderness resource and character.

Alternative # A – Full Motor Access Option

Description:

Use motorized vehicles to access all areas of the island; install wire exclosures to protect nests; install symbolic fencing to minimize human disturbance to nesting.

Under this alternative, refuge staff travels to South Monomoy boat landings by motorboat daily from early April to Mid-August for daylight-hour fieldwork. Supplies and personnel are transported by motorboat to and from the island twice a week (weather permitting) to boat landings along or within the wilderness boundary. Prior to the nesting season, an all-terrain vehicle (ATV) is used to transport gear, supplies, and equipment through wilderness to a seasonal field base at the Monomoy Point light keeper's house, located outside wilderness. Staff also use the ATV within the Monomoy Wilderness to transport and install symbolic fencing to discourage people from entering potential nesting areas. ATV use remains within the intertidal zone (between the mean high and low tide lines) whenever possible, and fencing and predator exclosure supplies are transported on foot from the ATV in the intertidal zone to installation areas at and above the mean high tide line. During the nesting season, one staff member rides an ATV patrolling the entire length of the South Monomoy beach from the intertidal zone whenever possible, searching for plover nests and broods. The ATV patrol will monitor the nest status through mid-August. An assessment is made as to whether each nest found needs an exclosure against predators. It is expected that any nest requiring an exclosure will be fitted with one following existing plover nest exclosure protocols (typically 5 to 10 nests annually based on habitat). Staff (3 to 5) will carry the exclosure materials from the ATV to the nest location. At the end of the season, staff will remove all materials and equipment (including symbolic fencing and exclosure materials) from wilderness locations with transport by ATV and/or motorboat for storage in non-wilderness locations.

Effects:

Wilderness Character
- **"Untrammeled"**
- **No Benefits**
- **Adverse Effects**
  - Exclosing nests to prevent predators from preying on nests constrains the wildness of the Monomoy Wilderness predator-prey processes, and represents a trammeling.

"Undeveloped"
No Benefits
Adverse Effects

- Using motorized equipment such as ATVs and motorboats in wilderness may be perceived by some wilderness users as intruding on the primeval character of the Monomoy Wilderness. Of the options considered, this option includes the most frequent and longest duration use of motorized transport within the Monomoy Wilderness.

- Installing temporary symbolic fencing and exclosures will have a negative effect on the undeveloped quality of the wilderness identical to the other options considered.

"Natural"
Benefits

- Naturalness will improve by protecting and conserving a threatened wildlife species that is a part of the natural character of the wilderness.

Adverse Effects

- The active management to increase piping plover populations and protect their nests from predators will have a negative effect on the natural quality of the wilderness.

"Outstanding opportunities for solitude or a primitive and unconfined type of recreation"
No Benefits
Adverse Effects

- Area closures and enforcement and nest predator exclosures would be visible and confine Monomoy Wilderness visitors during the piping plover breeding season to areas without plover nests. Refuge personnel, ATVs, and motorboats would be visually and audibly evident and may be perceived as intruding on solitude by some Monomoy Wilderness users more so than for the other options considered.

Other unique components that reflect the character of this wilderness—"ecological, geological, or other features of scientific, educational, scenic, or historic value."
Benefits

- The beach/dune nesting piping plover population is a unique ecological feature with scientific, educational, and scenic value to current and future generations of Americans.

No Adverse Effects

Heritage and Cultural Resources

N/A

Maintaining Traditional Skills

No Benefits
Adverse Effects

- Use of motorized and/or mechanized transport (ATVs, motorboats, and/or wheeled carts) in the Monomoy Wilderness reduces the contrast between wilderness and non-wilderness and, of the options considered, least perpetuates the use of primitive/traditional skills.

Special Provisions

N/A

Special Provisions

N/A

Economic and Time Constraints

Benefits

- All plover nests can be checked daily by one observer using an ATV, providing higher quality and consistent nest/brood survival and loss data. This is preferable to the 2 to 4 monitors required to accomplish the same level of monitoring entirely on foot.

Adverse Effects

- Costs of ATV purchase and boat and ATV equipment operation and maintenance, personnel training, and personal protective equipment.

Additional Wilderness-specific Comparison Criteria

N/A

Safety of Visitors, Personnel, and Contractors

Benefits

- Locating injured/ill victims needing medical evacuation is easier if an ATV is an available tool. Medical emergency evacuations (allowed per Section 4(c) of the Wilderness Act) are potentially much faster with an ATV and motorboat available than emergency responders traveling overland on foot.

- Personnel riding ATVs are more mobile and therefore exposed and vulnerable to the weather and environmental hazards for shorter durations.

- To the greatest extent of the options considered, transporting all heavier or bulky supplies, equipment, and other gear over longer distances on an ATV or using a nonmotorized mechanized transport reduces physical exertion and risk for dehydration, heart attack, heat-related illnesses, or hypothermia for employees.

Adverse Effects

- Risks involved with ATV use can be partially mitigated by training, maintenance, and use of personal protective equipment (PPE), but the potential for personnel injury is increased.

Alternative # B – Partial Motor Option

Description:

Use motor boats to drop off and pick up personnel from camp; use nonmotorized mechanized transport (wheeled cart) if loads exceed 80lbs and/or exceed three trips per person on foot; install wire exclosures to protect nests; install symbolic fencing to decrease human disturbance.

Under this alternative, refuge staff travel to South Monomoy boat landings by motorboat daily from early April to Mid-August for daylight-hour fieldwork. Prior to the nesting season all gear, supplies, and equipment for the seasonal field base at the Monomoy Point light keeper's house (non-wilderness) are dropped off at a boat landing along the wilderness boundary by motorboat and then transported on foot through wilderness to the light keeper's house; If loads exceed 80 lbs per person and/or three trips each, a nonmotorized wheeled cart may be used for transport. For all plover work, supplies and personnel are transported to and from the island twice weekly (weather permitting) by motorboat to boat landings along or in the Monomoy Wilderness boundary. Staff (2 to 10) then carry, position, and set up symbolic fencing to discourage people from entering potential plover nesting areas. During the nesting season, 2 to 4 biological staff on foot will search the entire length of the South Monomoy beach to monitor nests and broods. An assessment is made as to whether each nest found needs an exclosure against predators. It is expected that any nest requiring an exclosure will be fitted with one following existing exclosure protocols (typically 5 to 10 nests annually). Staff (3 to 5), will carry nest exclosure materials to the installation site. At season's end, staff will remove all gear, materials, and equipment (including symbolic fencing and exclosures) from the Monomoy Wilderness on foot to wilderness boundary boat landings, and transport it via motorboat for overwinter storage in non-wilderness locations.

Effects:

Wilderness Character

"Untrammeled"

No Benefits

Adverse Effects

- Exclosing nests to prevent predators from preying on nests constrains the wildness of the Monomoy Wilderness predator-prey processes, representing a trammeling to the same extent as other options considered.

"Undeveloped"

No Benefits

Adverse Effects

- Using motorized and mechanized transport in the Monomoy Wilderness will intrude on the primeval character perceived by some wilderness users but to a lesser extent than alternative A, the Full Motor access option.

- Installing temporary symbolic fencing and predator exclosures will have a negative effect on the undeveloped quality of the Monomoy Wilderness from April to August each year to the same extent as other options considered.

"Natural"
Benefits

- Protecting and conserving an endemic, threatened, wildlife species population in its natural habitat helps restore a component of the natural character of the Monomoy Wilderness.

Adverse effects.

- Artificially exclosing predators from nests is intended to disrupt the natural predator-prey process during nesting season on Monomoy NWR, including the Monomoy Wilderness, in order to increase piping plover nest productivity and adult survival.

"Outstanding opportunities for solitude or a primitive and unconfined type of recreation"
No Benefits
Adverse Effects

- Area closures and enforcement and nest predator exclosures present and visible during the piping plover breeding season confine the Monomoy Wilderness users' (primitive) recreation experience to areas devoid of plover nests to the same degree as other alternatives considered. Refuge personnel and motorboats will still be visually and audibly evident even without direct contact, and may be perceived as intruding on solitude by some Monomoy Wilderness users to a somewhat lesser extent than the Full Motor access option.

"Other unique components that reflect the character of this wilderness—ecological, geological, or other features of scientific, educational, scenic, or historic value."
Benefits

- The beach/dune nesting piping plover population is a unique ecological feature with scientific, educational, and scenic value to current and future generations of Americans.

No Adverse Effects

Heritage and Cultural Resources

N/A

Maintaining Traditional Skills

No Benefits
No Adverse Effects

- Use of motorized and nonmotorized mechanized transport in wilderness does not enhance/accentuate the contrast between wilderness and non–wilderness backcountry or perpetuate the use of primitive/traditional skills to the extent that the non-motor alternative does.

Special Provisions

N/A

Economic and Time Constraints

Benefits

Adverse Effects

- Cost of boat operation and maintenance, personnel training, and personal protective equipment.
- More staff time is spent transporting/carrying supplies and materials on foot through wilderness to field base or installation locations and backhauling at the end of each nesting season than under the Full Motor access alternative.

Additional Wilderness-specific Comparison Criteria

N/A

Safety of Visitors, Personnel, and Contractors

Benefits

- Medical emergency evacuations (allowed per Section 4(c) of the Wilderness Act) are potentially much faster when a motorboat is available than emergency responders traveling overland exclusively on foot.
- Transporting heavier or bulky supplies, equipment, and other gear over longer distances using nonmotorized mechanized transport somewhat reduces physical exertion and refuge employee risk of dehydration, heart attack, heat-related illnesses, or hypothermia.

Adverse Effects

- People on foot are much less mobile and are therefore exposed and vulnerable to the weather and environmental hazards for longer durations.
- Carrying all but the heavier supplies, equipment, or other gear increases physical exertion and risk for dehydration, heart attack, heat related illnesses, or hypothermia. The higher level of physical fitness thus required can be only partially mitigated by training, personnel selection, and providing personal protective equipment and Go/No-Go criteria.

Alternative # C – No Motor Option

Description:

Use no motorized transport; nonmotorized mechanized transport (wheeled cart) will be used if loads exceed 80lbs and/or exceed three trips per person on foot; install wire exclosures to protect nests; install symbolic fencing to decrease human disturbance.

Under this alternative, refuge staff travel to South Monomoy by paddling (kayak, weather permitting) from early April to Mid-August for daylight-hour fieldwork. On reaching South Monomoy, refuge staff hike through the Monomoy Wilderness to reach a seasonal field base at the Monomoy Point light keeper's house (non-wilderness). Personnel return in the same manner at the end of their field base assignments (10-days on/4-days off schedule). Prior to the plover nesting season, symbolic fencing and nest predator exclosures are dropped off via motorboat over a one- to two-day period at boat landings along or within the Monomoy Wilderness boundary, and then transported on foot through wilderness to deployment locations within wilderness. If loads exceed 80lbs per

person and/or three trips each, a nonmotorized wheeled cart may be used for transport. All field base supplies are stored at the light keeper's house (nonwilderness) during the off-season. Motorboat operation will be timed to coincide with low tide in order to keep motorized equipment from entering wilderness and will be used only for potable water and necessary personnel health/safety supplies. Staff (2 to 10) will carry, position, and install symbolic fencing to discourage people from entering potential plover nesting areas. During the nesting season, 3 to 4 biological staff concurrently search the entire length of the South Monomoy beach on foot, performing nest monitoring duties through mid-August. Personnel carry binoculars, data sheets, and other gear (e.g., water, insect repellant, etc.). An assessment is made as to whether each nest found needs an exclosure against predators. It is expected that any nest requiring an exclosure will be fitted with one following existing exclosure protocols (typically 5 to 10 nests annually based on habitat). Staff (3 to 5), will carry and install the nest exclosure materials to the installation sites. A supply of exclosure material is kept at field base (nonwilderness). At the end of the season, staff will remove all symbolic fencing and exclosure materials from wilderness locations, backhauling them on foot or using a nonmotorized cart to the field base, or to the wilderness boundary boat landings for pick-up by motor boat and transport to overwinter storage in non-wilderness locations.

Effects:

Wilderness Character

"Untrammeled"

No Benefits

Adverse Effects

- Exclosing nests to prevent predators from preying on nests constrains the wildness of the Monomoy Wilderness predator-prey processes, representing a trammeling.

"Undeveloped"

Benefits

- This alternative uses no motorized equipment in wilderness and, of the alternatives considered, best retains the primeval character of the Monomoy Wilderness.

Adverse Effects

- Using even limited mechanized transport in the Monomoy Wilderness will intrude on the primeval character perceived by some wilderness users; this option is similar in impact to alternative B, the Partial Motor option.

- Installing temporary symbolic fencing and predator exclosures will have a negative effect on the undeveloped quality of the Monomoy Wilderness from April-August each year as in the other options considered.

Natural"

Benefits

- Protecting and conserving an endemic, threatened, wildlife species population in its natural habitat helps restore a component of the natural character of the Monomoy Wilderness.

Adverse Effects

- Artificially exclosing predators from nests is intended to disrupt the natural predator-prey process during nesting season on Monomoy NWR, including the Monomoy Wilderness, in order to increase piping plover nest productivity and adult survival to the same extent as the other options considered.

"Outstanding opportunities for solitude or a primitive and unconfined type of recreation"
No Benefits
Adverse Effects

- Area closures and enforcement and nest predator exclosures present and visible during the piping plover breeding season confine Monomoy Wilderness users' (primitive) recreation experience to areas devoid of plover nests. With larger numbers of refuge personnel required concurrently for plover monitoring, their kayaks or motorboats would be more visually and audibly evident even without direct contact, and may be perceived as intruding on solitude by some Monomoy Wilderness users more than the other options considered.

Other unique components that reflect the character of this wilderness—ecological, geological, or other features of scientific, educational, scenic, or historic value."
Benefits

- The beach/dune nesting piping plover population is a unique ecological feature with scientific, educational, and scenic value to current and future generations of Americans.

No Adverse Effects

Heritage and Cultural Resources

N/A

Maintaining Traditional Skills

Benefits

- Minimizing non–motorized transport in the Monomoy Wilderness enhances and accentuates the contrast between wilderness and non–wilderness, and perpetuates the use of primitive traditional skills to a greater extent than the other options considered.

No Adverse Effects

- Even limited nonmotorized mechanical transport (wheeled cars) use within the Monomoy Wilderness somewhat reduces the contrast between wilderness and non-wilderness and reduces use of primitive traditional skills, but to a lesser degree than the other options considered.

Special Provisions

N/A

Economic and Time Constraints

No Benefits
Adverse Effects

- Cost to train personnel on kayak use.
- Cost to hire/acquire more staff.
- Cost to obtain more kayaks and safety equipment and otherwise equip refuge personal to safely and adequately perform their job duties.
- Substantially increased numbers of plover monitoring and management staff positions and time required to travel by kayak to and from field assignments. Fewer field days with weather and sea conditions suitable for kayaking across open water available.

Additional Wilderness-specific Comparison Criteria

N/A

Safety of Visitors, Personnel, and Contractors

No Benefits

- Transporting limited supplies, equipment, and other gear over longer distances using nonmotorized mechanized transport slightly reduces physical exertion and risk for dehydration, heart attack, heat-related illnesses, or hypothermia than the options considered, due to greater use of human-powered watercraft.

Adverse Effects

- People on foot or paddling are much less mobile and therefore exposed and vulnerable to the weather, adverse sea and tidal current conditions, and environmental hazards for longer durations.
- Carrying all but the heavier supplies, equipment, or other gear increases physical exertion and risk for dehydration, heart attack, heat-related illnesses, or hypothermia. The higher level of physical fitness thus required can only be partially mitigated by training, personnel selection, and providing personal protective equipment and Go/No-Go criteria.
- Risks of kayak use include exposure, capsizing, and drowing and can only be partially mitigated by training, communications, and personal protective equipment.
- Greatest reliance on maritime aerial medical evacuation is required. This is an already scarce emergency service resource (allowed under Section 4(c) of the Wilderness Act) in the area that is not always available when needed.

Alternative # D – No Action

The piping plover is a migratory, threatened species, and its protection and recovery is mandated under the Endangered Species Act. The migratory bird purpose for which Monomoy National Wildlife Refuge was established cannot be achieved under a No Action alternative. Therefore, the No Action alternative was not analyzed further.

Comparison of Alternatives

It may be useful to compare each alternative's positive and negative effects to each of the criteria in tabular form, keeping in mind the law's mandate to "preserve wilderness character."

	Alternative A	Alternative B	Alternative C
Untrammeled	-	-	-
Undeveloped	- - - -	- - -	- -
Natural	+/-	+/-	+/-
Solitude or primitive recreation	- -	-	- -
Unique components	+	+	+
WILDERNESS CHARACTER	++/--------	++/------	++/------

	Alternative A	Alternative B	Alternative C
Heritage & Cultural Resources	NA	NA	NA
Maintaining Traditional Skills	---	+/--	++/-
Special Provisions	NA	NA	NA
Economics & Time	++/-	--	- - -
Additional Wilderness Criteria	NA	NA	NA
OTHER CRITERIA SUMMARY	++/----	+/----	++/----

	Alternative A	Alternative B	Alternative C
SAFETY	++/-	+/-	+/---

	Alternative A	Alternative B	Alternative C
OVERALL	6+'s / 12 –'s	4 +'s/ 11 –'s	5 +'s / 13 –'s

Safety Criterion
Significant personnel safety concerns associated with kayak use in open waters intermixed with motorized boat traffic in the same waters surrounding the Monomoy Wilderness in alternative C's open-water kayak use can only partially be mitigated by training and provision of PPE. The unmitigated personnel safety concerns for alternative C override impacts to wilderness character or other criteria for alternative C. Job hazard analyses for watercraft operation and for working in remote areas summarize the hazards and mitigations that are common to all alternatives analyzed.

Documentation:

Step 2 Decision: **What is the Minimum Activity?**

Selected Alternative: Alternative B—Partial Motor Option

Rationale for selecting this alternative (including documentation of safety criterion, if appropriate):
The Partial Motor option adequately protects and conserves the piping plover while safely minimizing the negative impacts to the wilderness character of the Monomoy Wilderness. It does so by limiting the use of motor vehicles and nonmotorized mechanized transport to support restricted staff time used efficiently to monitor disturbance-sensitive piping plovers. The Partial Motor option best protects wilderness character and meets the requirements of the Endangered Species Act, as well as best satisfies the other comparison criteria.

The Full Motor option has the most negative impact on wilderness character from motorized vehicle (boats and ATV) and nonmechanized transport. The Partial Motor option has slightly greater negative impact than the No Motor option on the undeveloped character of the Monomoy Wilderness with greater motorboat use. Fewer human contacts are likely for wilderness users with the smaller plover monitoring workforce presence under the Partial Motor option than the No Motor option; the Partial Motor option therefore has less adverse impact on solitude. The Partial Motor option provides a greater level of safety hazard mitigation for refuge personnel engaged in piping plover monitoring and management by minimizing hazard exposure during open-water kayak transport to/from assigned work locations that is presented in the No Motor option.

Monitoring and reporting requirements:
Monitoring and reporting of the operations associated with the nesting and protection project will continue on a yearly basis. This information will be maintained in the Monomoy NWR headquarters and will be available for review by anyone interested.

The refuge manager for Monomoy NWR will document that a review and re-validation of this programmatic minimum requirements analysis has been completed prior to April 1 each year. If at any point the refuge manager determines this analysis is no longer valid, or within 10 years (whichever comes first), a new minimum requirements analysis will be prepared and approved.

Check any Wilderness Act Section 4(c) uses approved in this alternative:

- [x] mechanical transport
- [ ] motorized equipment
- [ ] motor vehicles
- [x] motorboats
- [ ] landing of aircraft
- [ ] temporary road
- [x] structure or installation

Record and report any authorizations of Wilderness Act Section 4(c) uses according to agency procedures.

Approvals	Signature	Name	Position	Date
Prepared by:				
Recommended:				
Recommended:				
Approved:				

ARTHUR CARHART NATIONAL WILDERNESS TRAINING CENTER

MINIMUM REQUIREMENTS DECISION GUIDE

WORKSHEETS

Monomoy Refuge Banding Station

". . . except as necessary to meet minimum requirements for the administration of the area for the purpose of this Act..."

– the Wilderness Act, 1964

Step 1: Determine if it is necessary to take any action.

Description: Briefly describe the situation that may prompt action.

In support of the refuge's mission to conserve and protect migratory birds, the refuge is interested in studying how passerines utilize Monomoy NWR during fall migration.

The purpose of this study is to collect data on the use of the refuge as a stopover site for landbirds and to better manage the wildlife refuge for the benefit of those birds, in addition to seabirds and shorebirds that rely on the habitat. We are proposing to set up a banding station through partner cooperation at a site located on the refuge for the next few years to gather more data that will enable us to:

1. Determine species richness and composition of migrants traveling through the Monomoy NWR to identify critical resources.
2. Analyze the relationship between landbird use versus marine-oriented species use on the refuge
3. Provide the basis for long-term trend analysis of bird populations in the area.

To determine if administrative action is necessary, answer the questions listed in A–F on the following pages.

A. Describe Options Outside of Wilderness

Is action necessary within wilderness?

Yes: ☒ **No:** ☐

Explain:
Obtainable habitat for land bird migrants using stopover sites is only available within our wilderness. The goal of this project is to sample birds on Monomoy NWR to better understand the species richness and composition within our unique landscape and locale. In order for us to successfully sample these species, work must be done in the Monomoy Wilderness.

B. Describe Valid Existing Rights or Special Provisions of Wilderness Legislation

Is action necessary to satisfy valid existing rights or a special provision in wilderness legislation (the Wilderness Act of 1964 or subsequent wilderness laws) that allows consideration of the Section 4(c) prohibited uses? Cite law and section.

Yes: ☐ **No:** ☒ **Not Applicable:** ☐

Explain:
There are no existing valid rights or special provisions found in any wilderness legislation to sample land birds during migration on the refuge.

C. Describe Requirements of Other Legislation

Is action necessary to meet the requirements of other laws?

Yes: ☒ **No:** ☐ **Not Applicable:** ☐

Explain:
The refuge was established in 1944 pursuant to the Migratory Bird Conservation Act (16 U.S.C. § 715d) "… for use as an inviolate sanctuary, or for other management purpose, for migratory birds"; through a Declaration of Taking (United States vs. Commonwealth of Massachusetts, and Susie H. Kosak et al, Miscellaneous Civil No. 6340, District Court of Massachusetts) "…for the protection during the nesting season or while on their way to and from their breeding grounds…", with an emphasis on threatened, endangered and migratory birds. The National Wildlife Refuge System Improvement Act of 1966, as amended by the Wildlife Refuge System Improvement Act of 1997 (16 U.S.C 668dd-ee), directs the U.S. Fish and Wildlife Service "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."

D. Describe Other Guidance

Is action necessary to conform to direction contained in agency policy, unit and wilderness management plans, species recovery plans, or agreements with tribal, state and local governments or other federal agencies?

Yes: ☒ **No:** ☐ **Not Applicable:** ☐

Explain:
The preferred alternative of the Draft Monomoy NWR Comprehensive Conservation Plan states in Alternative B, Objective 1.6 that the refuge is tasked with protecting existing native maritime shrubland and evaluating use by migrating land birds of conservation concern. If patches of maritime shrubland are found to be regionally important, the refuge must maintain native species composition (including bayberry, beach plum, etc.) with less than 5 percent invasive plants. To accomplish these objectives, the refuge must engage in monitoring of land bird species using the area surrounding the Monomoy keeper's house during migration.

Policy on Maintaining Biological Integrity, Diversity and Environmental Health (601 FW 3) This policy provides guidance on maintaining or restoring the biological integrity, diversity, and environmental health of the Refuge System, including the protection of a broad spectrum of fish, wildlife, and habitat resources in refuge ecosystems. It provides refuge managers with a process for evaluating the best management direction to prevent the additional degradation of environmental conditions and to restore lost or severely degraded environmental components. It also provides guidelines for dealing with external threats to the biological integrity, diversity, and environmental health of a refuge and its ecosystem. In recognition of Monomoy NWR's role as a reservoir for avian diversity, the refuge was designated as a Western Hemisphere Shorebird Reserve Network (Regional) site under the auspices of the WHSRN Hemispheric Council, and as an Important Bird Area (IBA) by the Audubon Society.

E. Wilderness Character

Is action necessary to preserve one or more of the qualities of wilderness character including: untrammeled, undeveloped, natural, outstanding opportunities for solitude or a primitive and unconfined type of recreation, or unique components that reflect the character of this wilderness area?

Untrammeled: **Yes:** ☐ **No:** ☒ **Not Applicable:** ☐

Explain:

Undeveloped: **Yes:** ☐ **No:** ☒ **Not Applicable:** ☐

Explain:

Natural: **Yes:** ☒ **No:** ☐ **Not Applicable:** ☐

Explain:
Habitat and population management is necessary to maintain a native species ecologically adapted to Monomoy NWR, including the Monomoy Wilderness, thus preserving and improving the naturalness of the Monomoy Wilderness.

Outstanding opportunities for solitude or a primitive and unconfined type of recreation:

Yes: ☐ **No:** ☒ **Not Applicable:** ☐

Explain:

Other unique components that reflect the character of this wilderness:

Yes: ☒ **No:** ☐ **Not Applicable:** ☐

Explain:
Migrating landbirds contribute to the biotic diversity and integrity of the Monomoy Wilderness and also to the unique scientific and ecological values of the area

F. Describe Effects to the Public Purposes of Wilderness

Is action necessary to support one or more of the public purposes for wilderness (as stated in Section 4(b) of the Wilderness Act) of recreation, scenic, scientific, education, conservation, and historical use?

Recreation: **Yes:** ☐ **No:** ☒ **Not Applicable:** ☐

Explain:

Scenic: **Yes:** ☐ **No:** ☒ **Not Applicable:** ☐

Explain:

Scientific: **Yes:** ☒ **No:** ☐ **Not Applicable:** ☐

Explain:
This project will add to the scientific base of knowledge on how migrant species are using the refuge and what management could be done to improve the habitat for these species.

Education: **Yes:** ☐ **No:** ☒ **Not Applicable:** ☐

Explain:

Conservation: **Yes:** ☒ **No:** ☐ **Not Applicable:** ☐

Explain:
Understanding migrant land bird use on the refuge could help to better conservation and management for these species.

Historical use: **Yes:** ☐ **No:** ☒ **Not Applicable:** ☐

Explain:

Step 1 Decision: **Is any administrative action necessary in wilderness?**

Yes: ☒ **No:** ☐ **Not Applicable:** ☐

Explain:
Yes. Action is necessary to gain a base of scientific knowledge of how migrants are using the interior portions of the refuge as a stopover site so that appropriate actions can be taken to protect them and uphold the refuge's purpose.

If action is necessary, proceed to Step 2 to determine the minimum activity.

Step 2: Determine the minimum activity.

Description of Alternatives

For each alternative, describe what methods and techniques will be used, when the activity will take place, where the activity will take place, what mitigation measures are necessary, and the general effects to the wilderness resource and character.

Alternative # A – Full Motor Option

Description:

Use motorized vehicles to access all areas of the island (motorboats and ATVs); set up a daily banding station and erect temporary mist-nets to capture migrants; use a non-wilderness site to house staff when necessary (referred to as the Full Motor option).

Under this alternative, staff of the Monomoy Refuge Banding Station will travel to the south tip of South Monomoy daily by motorboat to perform data collection activities. Mist nets will be set up in various locations around the entire south tip interior of South Monomoy to sample all possible birds using the area. To expedite data processing, mist nets will be visited using an ATV, which will enable the data collection to be undertaken over a wide area of the refuge. The nets will be opened for 6 hours a day beginning ½ hour before sunrise. The netting period will start August 15th and end November 15th as weather and transportation allow. Following mist-netting, staff will conduct an hour-long survey each day by ATV using a set census path to count birds. At the beginning and end of the sampling period, supplies will be delivered to the south end via motorboat and transported to the Monomoy light keeper's house through wilderness to the area where the banding station will be based. ATVs will not be used on the beach or in wetland areas to avoid degradation of habitat and, instead, will be kept in areas already used as footpaths. Mist nets will also be utilized on North Monomoy Island to census various sparrow species during one week in October. ATVs will not be used on North Monomoy, but access to the island will be by motorboat. Staff of the Monomoy Refuge Banding Station will not live at the site and will travel back and forth each day for the entire sampling period.

Effects:

Wilderness Character

"Untrammeled"
No Benefits
Adverse Effects

- The action to capture migrant bird species prevents them for a temporary amount of time from moving around the refuge in a natural way.

"Undeveloped"
No Benefits
Adverse Effects

- Using motorized equipment and mechanized transportation in wilderness is inconsistent with the requirement to retain the primeval character of wilderness.
- The temporary installation of mist nets will have a negative effect on the undeveloped quality of the wilderness.

"Natural"
Benefits

- Naturalness may improve if this research leads to future habitat protection for critical migrant species, thereby helping to maintain a component of the natural character of the Monomoy Wilderness.

No Adverse Effects

"Outstanding opportunities for solitude or a primitive and unconfined type of recreation"
No Benefits
Adverse Effects

- The operation of an ATV within the wilderness will disrupt the opportunities for solitude in the wilderness.

Other unique components that reflect the character of this wilderness

- The land bird population is a unique ecological feature with scientific, educational, and scenic value to current and future generations of Americans.

Heritage and Cultural Resources

N/A

Maintaining Traditional Skills

No Benefits
Adverse Effects

- Use of motorized equipment and mechanized transportation in wilderness does not enhance the contrast between wilderness and non-wilderness or perpetuate the use of primitive traditional skills.

Special Provisions
N/A

Economic and Time Constraints
No Benefits
Adverse Effects
- Cost of ATV operation and maintenance.

Additional Wilderness-specific Comparison Criteria
N/A

Safety of Visitors, Personnel, and Contractors

No Benefits
Adverse Effects
- Risks associated with ATV use can be mitigated by training.

Alternative # B – Partial Motor Option A

Description:

Use motorboats to drop off personnel and supplies to island weekly; set up a daily banding station and erect temporary mist-nets to capture migrants; provide shelter at the Monomoy light keeper's house (referred to as Partial Motor Option A).

Under this alternative, staff of the Monomoy Refuge Banding Station will travel to the south tip of South Monomoy by motorboat to perform data collection activities. At the beginning and end of the sampling period, supplies will be delivered to the south end via motorboat and transported by foot to the Monomoy light keeper's house through wilderness to the area where the banding station will be based. The netting period will start August 15th and end November 15th as weather and transportation allow. A maximum of two boat trips per week will be conducted, if needed. Mist nets will be set up in various locations around the entire south tip interior of South Monomoy to sample all possible birds using the area. The nets will be opened for 6 hours a day, beginning ½ hour before sunrise. Following mist-netting, staff will conduct an hour-long survey each day by foot to count birds using a set census path. Mist nets will also be utilized on North Monomoy Island to census various sparrow species during one week in October; transportation will be through the use of a motorboat. Staff of the Monomoy Refuge Banding Station will live at the site in the Monomoy light keeper's house (non-wilderness) for the entire sampling period.

Effects:

Wilderness Character
"Untrammeled"
No Benefits
Adverse Effects
- The action to capture migrant bird species for study purposes prevents them from moving around the refuge in a natural way for a temporary amount of time.

"Undeveloped"
No Benefits
Adverse Effects

- Use, even limited use, of mechanized transportation in wilderness is inconsistent with the requirement to retain the primeval character of wilderness.
- The temporary installation of mist nets will have a negative effect on the undeveloped quality of the wilderness.

"Natural"
Benefits

- Naturalness may improve if this research leads to future habitat protection for critical migrant species, thereby helping to maintain a component of the natural character of the Monomoy Wilderness.

No Adverse Effects

"Outstanding opportunities for solitude or a primitive and unconfined type of recreation"
No Benefits or Adverse Effects

Other unique components that reflect the character of this wilderness

- The land bird population is a unique ecological feature with scientific, educational, and scenic value to current and future generations of Americans.

Heritage and Cultural Resources
N/A

Maintaining Traditional Skills
No Benefits
Adverse Effects

- Limited use of mechanized transportation in wilderness does not enhance the contrast between wilderness and non-wilderness or perpetuate the use of primitive traditional skills.

Special Provisions
N/A

Economic and Time Constraints
No Benefits or Adverse Effects

Additional Wilderness-specific Comparison Criteria
N/A

Safety of Visitors, Personnel, and Contractors
No Benefits or Adverse Effects

Alternative # C – Partial Motor Option B

Description:

Use motorboats to drop off personnel and supplies to the island weekly; conduct census of migrants in wilderness only (referred to as the Partial Motor Option B).

Under this alternative, staff of the Monomoy Refuge Banding Station will travel to the south tip of South Monomoy weekly by motorboat to perform data collection activities. The census period will start August 15th and end November 15th as weather and transportation allow. Each day, staff will conduct an hour-long survey by foot to count birds using a set census path. At the beginning and end of the sampling period, supplies will be delivered to the south end via motorboat and transported to the Monomoy light keeper's house through wilderness. A census will also be conducted on North Monomoy Island to survey various sparrow species during one week in October. Staff of the Monomoy Refuge Banding Station will live at the site and will have limited travel from the island during the entire census period.

Effects:

Wilderness Character

"Untrammeled"
No Benefits or Adverse Effects

"Undeveloped"
No Benefits
Adverse Effects

- Limited use of mechanized transportation in wilderness is inconsistent with the requirement to retain the primeval character of wilderness.

"Natural"
Benefits

- Naturalness may improve if this research leads to future habitat protection for critical migrant species, thereby helping to maintain a component of the natural character of the Monomoy Wilderness.

No Adverse Effects

"Outstanding opportunities for solitude or a primitive and unconfined type of recreation"
No Benefits or Adverse Effects

Other unique components that reflect the character of this wilderness

- The land bird population is a unique ecological feature with scientific, educational, and scenic value to current and future generations of Americans.

Heritage and Cultural Resources

N/A

Maintaining Traditional Skills

No Benefits

Adverse Effects

- Limited use of mechanized transportation in wilderness does not enhance the contrast between wilderness and non-wilderness or perpetuate the use of primitive traditional skills.

Special Provisions

N/A

Economic and Time Constraints

No Benefits

Adverse Effects

- More time will be spent to adequately identify land bird species by sight and sound, which may impact the overall results on how birds are using the wilderness area as a stopover site, which in turn could affect future management on Monomoy Refuge.

Additional Wilderness-specific Comparison Criteria

N/A

Safety of Visitors, Personnel, and Contractors

No Benefits or Adverse Effects

Comparison of Alternatives

It may be useful to compare each alternative's positive and negative effects to each of the criteria in tabular form, keeping in mind the law's mandate to "preserve wilderness character."

	Alternative A	Alternative B	Alternative C
Untrammeled	-	-	+
Undeveloped	---	--	-
Natural	+	+	+
Solitude or Primitive Recreation	-	+	+
Unique components	+	+	+
WILDERNESS CHARACTER	++/-----	+++/---	++++/-

	Alternative A	Alternative B	Alternative C
Heritage & Cultural Resources	N/A	N/A	N/A
Maintaining Traditional Skills	--	-	-
Special Provisions	N/A	N/A	N/A
Economics & Time	-	+	-
Additional Wilderness Criteria	N/A	N/A	N/A
OTHER CRITERIA SUMMARY	---	+/-	--

	Alternative A	Alternative B	Alternative C
SAFETY	Partially Mitigated	Mitigated	Mitigated

	Alternative A	Alternative B	Alternative C
OVERALL	2(+) / 8(-)	4(+) / 4(-)	4(+) / 3(-)

Safety Criterion
If safety issues override impacts to wilderness character or other criteria, provide documentation that the use of motorized equipment or other prohibited uses is necessary because to do otherwise would cause increased risks to workers or visitors that cannot be satisfactorily mitigated through training, use of personal protective equipment (PPE), or other requirements to alleviate the safety risk. (This documentation can take the form of agency accident-rate data tracking occurrences and severity; a project-specific job hazard analysis; research literature; or other specific agency guidelines.)

Documentation:

Step 2 Decision: **What is the Minimum Activity?**

Selected alternative: Alternative B – Partial Motor Option A

Rationale for selecting this alternative (including documentation of safety criterion, if appropriate):
Alternative B, Partial Motor Option A, adequately conserves land birds. At the same time, this option safely minimizes the negative impacts to the wilderness character of the Monomoy Wilderness by limiting the use of motor vehicles and using time efficiently to survey the species. Partial Motor Option A best protects the wilderness quality, meets the requirements of the Migratory Bird Conservation Act, and best satisfies the other comparison criteria.

Alternative A (Full Motor Option) has the most negative impact on wilderness character. Alternative B has slightly greater negative impact than Alternative C on the undeveloped character of the Monomoy Wilderness. However, Alternative B provides a decreased level of economic and time constraints than Alternative C by using time more efficiently to monitor and census land birds and potentially increase habitat protection.

Monitoring and reporting requirements:
Monitoring and reporting of the operations associated with the project will continue on a yearly basis. This information will be maintained in the Monomoy NWR headquarters and will be available for review by anyone interested.

The refuge manager for Monomoy NWR will document that a review and re-validation of this programmatic minimum requirements analysis has been completed prior to April 1 each year. If at any point the refuge manager determines this analysis is no longer valid, or within 10 years (whichever comes first), a new minimum requirements analysis will be prepared and approved.

Check any Wilderness Act Section 4(c) uses approved in this alternative:

- ☐ mechanical transport
- ☐ motorized equipment
- ☐ motor vehicles
- ☐ motorboats
- ☐ landing of aircraft
- ☐ temporary road
- ☐ structure or installation

Record and report any authorizations of Wilderness Act Section 4(c) uses according to agency procedures.

Approvals	Signature	Name	Position	Date
Prepared by:				
Recommended:				
Recommended:				
Approved:				

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MINIMUM REQUIREMENTS DECISION GUIDE

WORKSHEETS

Habitat Management and Predator Control for Nesting Roseate Terns and Common Terns on South Monomoy Wilderness Area

". . . except as necessary to meet minimum requirements for the administration of the area for the purpose of this Act..."

– the Wilderness Act, 1964

Step 1: Determine if it is necessary to take any action.

Description: Briefly describe the situation that may prompt action.

Monomoy NWR's CCP recognizes the importance of resource management within the wilderness to insure the health of the wilderness, preserve the wilderness character and species richness, and improve nest productivity.

Since the reestablishment of a productive common tern colony on Monomoy in the late 1990s, this site has been one of the most important sites in the State, and in some years has provided nesting habitat for more than 50 percent of the State's total common tern population. The increase of nesting common terns in the first few years following the start of the reestablishment project was concomitant with a decline in the number of nesting common terns at Plymouth Beach (Massachusetts NHESP census data 1996). Birds nesting at Plymouth Beach had been subjected to predator pressures prior to abandoning that site and moving to Monomoy NWR, suggesting that Monomoy NWR was more appealing to prospecting terns at that time. Common terns were successfully nesting at Monomoy NWR and, as predator pressures remained unresolved at Plymouth Beach, many terns continued returning to Monomoy NWR to nest, attracting more common terns each year. For several years Monomoy NWR has also hosted an increasing number of roseate terns. However, the increasing nesting terns were generally nesting in a similar-sized area in successive years, although the shape of the nesting colony changed. Impacts of increased nesting density were not specifically studied, but anecdotal observations suggested increased neighbor aggression and disturbance among common terns. In addition, increased aggression was seen between common and roseate terns, which may have contributed to the decline in roseate tern numbers and

their eventual relocation to Minimoy Island, although predation may have also contributed to this shift. Storm overwash and erosion over the last several years has severely reduced available nesting space on Minimoy Island, and roseate terns have mostly abandoned this site as well.

During the last 10 years, we have experimented with various types of habitat management on a small scale, but have only recently applied management at a scale that exceeds the current nesting area, such as a prescribed burn of 30+ acres. Careful monitoring of different techniques now provides the foundation for moving forward with habitat management on a much larger scale. Providing more habitat may allow for more nesting common terns but, more importantly, would allow common terns to increase nearest neighbor distances while still maintaining the benefit of being colony members. We also expect prospecting roseate terns to find nesting space more readily within a common tern colony that is not at a saturated density. Roseate terns generally nest 7-10 days later than common terns, so prospecting roseate terns are often trying to establish a territory amid hundreds or thousands of already established common tern territories. Roseate terns are also generally a bit more skittish and less aggressive than common terns, which presents an additional challenge to prospecting roseate terns that are continually being chased by common terns. A larger habitat base would also allow terns to move around between microhabitats within the larger area, as we apply a rotational-based habitat management scheme. We plan to continue working mostly on the north end of South Monomoy, where terns have nested during the last 15 years.

We expect that by providing a larger habitat base, the number of nesting roseate terns would increase. The decline in the number of nesting roseate terns in the Northeast since 2000 is especially troubling because in most years very few sites host more than 100 pairs. In addition to providing more nesting habitat, we will actively attract prospecting roseate terns to this area. Sound systems that play recordings of roseate terns, combined with tern decoys, have been successful at luring terns to nesting sites on other islands (USFWS 2002, USFWS 2005). Placement of sound systems and playback protocols will be based initially on what has been successful at other sites, and will be modified annually to increase the effectiveness on Monomoy NWR.

To determine if administrative action is <u>necessary</u>, answer the questions listed in A - F on the following pages.

A. Describe Options Outside of Wilderness

Is action necessary within wilderness?

Yes: ☒ **No:** ☐

Explain:
The U.S. Fish and Wildlife Service is charged with the responsibility for successfully managing roseate terns nesting within or adjacent to the Monomoy Wilderness. On Monomoy NWR, 96% of our larger terns nest in wilderness (based on 2012 census data); however, this can vary from year to year. While some tern management performed outside of wilderness, like predator control or habitat management to improve other sites, can benefit terns in Massachusetts by creating other areas for them to nest, nesting terns benefit most when these management activities are done in close proximity to their chosen nesting areas, regardless of wilderness status. The non-wilderness areas on the refuge are either too far away from the colony or too small in size for management to benefit nesting terns. Other landowners of non-wilderness tern nesting areas are unable or unlikely to employ the full range of inter-dependent tern management activities to achieve refuge tern population and productivity objectives that we are able to conduct on the refuge.

B. Describe Valid Existing Rights or Special Provisions of Wilderness Legislation

Is action necessary to satisfy valid existing rights or a special provision in wilderness legislation (the Wilderness Act of 1964 or subsequent wilderness laws) that allows consideration of the Section 4(c) prohibited uses? Cite law and section.

Yes: ☐ **No:** ☒ **Not Applicable:** ☐

Explain:
There are no existing valid rights or special provisions found in any wilderness legislation to recover threatened or endangered species inside this wilderness.

C. Describe Requirements of Other Legislation

Is action necessary to meet the requirements of other laws?

Yes: ☒ **No:** ☐ **Not Applicable:** ☐

Explain:
The Endangered Species Act of 1973 (16 U.S.C 1531-1544), as amended, directs the Department of the Interior to identify those species of plants and animals that are threatened and endangered, and develop and implement plans and programs to ensure their survival into the future.

The refuge was established in 1944 pursuant to the **Migratory Bird Conservation Act (16 U.S.C. § 715d)** "… for use as an inviolate sanctuary, or for other management purpose, for migratory birds"; through a Declaration of Taking (United States vs. Commonwealth of Massachusetts, and Susie H. Kosak et al, Miscellaneous Civil No. 6340, District Court of Massachusetts) "…for the protection during the nesting season or while on their way to and from their breeding grounds…", with an emphasis on threatened, endangered and migratory birds. **The National Wildlife Refuge System Improvement Act of 1966, as amended by the Wildlife Refuge System Improvement Act of 1997 (16 U.S.C 668dd-ee)**, directs the U.S. Fish and Wildlife Service "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."

D. Describe Other Guidance

Is action necessary to conform to direction contained in agency policy, unit and wilderness management plans, species recovery plans, or agreements with tribal, state and local governments or other federal agencies?

Yes: ☒ **No:** ☐ **Not Applicable:** ☐

Explain:
Healthy habitat supports all CCP goals. The Roseate Tern Recovery Plan identifies specific habitat requirements for this species. This document addresses a critical preservation issue for current and future roseate tern populations. The plan lists six recovery strategies:

- Protection and stabilization of existing breeding colonies
- Determination of ecological characteristics and limiting factors
- Restoration/creation of breeding sites and enhancement of numbers
- Protection and management of terns in their winter quarters
- Administrative actions
- Public involvement

Policy on Maintaining Biological Integrity, Diversity and Environmental Health (601 FW 3)
This policy provides guidance on maintaining or restoring the biological integrity, diversity, and environmental health of the Refuge System, including the protection of a broad spectrum of fish, wildlife, and habitat resources in refuge ecosystems. It provides refuge managers with a process for evaluating the best management direction to prevent the additional degradation of environmental conditions and to restore lost or severely degraded environmental components. It also provides guidelines for dealing with external threats to the biological integrity, diversity, and environmental health of a refuge and its ecosystem. In recognition of Monomoy NWR's role as a reservoir for avian diversity, the refuge was also designated as a Western Hemisphere Shorebird Reserve Network (Regional) site under the auspices of the WHSRN Hemispheric Council, and as an Important Bird Area (IBA) by the Audubon Society.

E. Wilderness Character

Is action necessary to preserve one or more of the qualities of wilderness character including: untrammeled, undeveloped, natural, outstanding opportunities for solitude or a primitive and unconfined type of recreation, or unique components that reflect the character of this wilderness area?

Untrammeled: **Yes:** ☐ **No:** ☒ **Not Applicable:** ☐

Explain:

Undeveloped: **Yes:** ☐ **No:** ☒ **Not Applicable:** ☐

Explain:

Natural: **Yes:** ☒ **No:** ☐ **Not Applicable:** ☐

Explain:
Species management and predator control are necessary to improve the naturalness of this area and maintain native species on the island. This project contributes to the conservation of a native species that is ecologically adapted to the area.

Outstanding opportunities for solitude or a primitive and unconfined type of recreation:

Yes: ☒ **No:** ☐ **Not Applicable:** ☐

Explain:
In order to preserve the outstanding character of wildlife observation, it is necessary to preserve roseate terns and a common tern colony. Doing so preserves the opportunity to see native species in their natural habitat.

Other unique components that reflect the character of this wilderness:

Yes: ☒ **No:** ☐ **Not Applicable:** ☐

Explain:
Roseate and common terns contribute to the biotic diversity and integrity of the refuge and also provide scientific and ecological value, which are included in "other."

F. Describe Effects to the Public Purposes of Wilderness

Is action necessary to support one or more of the public purposes for wilderness (as stated in Section 4(b) of the Wilderness Act) of recreation, scenic, scientific, education, conservation, and historical use?

Recreation: **Yes:** ☐ **No:** ☒ **Not Applicable:** ☐

Explain:

Scenic: **Yes:** ☐ **No:** ☒ **Not Applicable:** ☐

Explain:

Scientific: **Yes:** ☒ **No:** ☐ **Not Applicable:** ☐

Explain:
This project could add to the scientific base of knowledge on managing a highly productive common tern colony and increasing roseate tern productivity and population recovery.

Education: **Yes:** ☐ **No:** ☒ **Not Applicable:** ☐

Explain:

Conservation: **Yes:** ☒ **No:** ☐ **Not Applicable:** ☐

Explain:
This action could help to conserve roseate tern, a federally endangered species, and could increase species success and population numbers overall.

Historical use: **Yes:** ☐ **No:** ☒ **Not Applicable:** ☐

Explain:

Step 1 Decision: **Is any administrative action necessary in wilderness?**

Yes: ☐ **No:** ☐ **Not Applicable:** ☐

Explain:
Yes. Action is necessary to protect and conserve a federally listed endangered species, roseate tern, as well as a highly productive common tern colony. Roseate and common terns contribute to the biotic diversity and integrity of the refuge and its scientific and ecological value. Since the reestablishment of a productive common tern colony on Monomoy in the late 1990s, this site has been one of the most important sites in the State, and in some years has provided nesting habitat for more than 50 percent of the State's total population of the species.

If action is necessary, proceed to Step 2 to determine the minimum activity.

Step 2: Determine the minimum activity.

Please refer to the accompanying Minimum Requirements Decision Guide *Instructions* **for an explanation of the effects criteria displayed below.**

Description of Alternatives

For each alternative, describe what methods and techniques will be used, when the activity will take place, where the activity will take place, what mitigation measures are necessary, and the general effects to the wilderness resource and character.

Alternative # A – Full Motor Option

Description:

Use motorized vehicles to access all areas of the island; build temporary structures and installations including field camp, blinds, symbolic fencing, nesting structures, chick shelters, sound system, decoys, productivity plots, and grid markers; conduct predator control (referred to as the Full Motor option).

Under this alternative, biological staff will travel to South Monomoy boat landing by motorboat every day from the beginning of April to mid-August and work all daylight hours. Prior to the nesting season, a motorboat would be used to carry materials to drop off all gear, supplies, and equipment to set up a temporary field camp within the wilderness boundary that would remain in place for the entire season and to establish the grid system. Staff would use an ATV to carry and set up symbolic fencing to keep people out of potential nesting areas. During this time temporary wooden nesting/chick structures (providing shade, cover, and artificial habitat), decoys, and sound system (two speakers, box containing cd player, battery, and sound equipment, and solar panel decoys) would be installed in the colony to attract nesting roseate terns during the start of the nesting season. The sound system will be operated during daylight use only and manually turned on and off by on-island staff personnel. Use of the ATV would remain below the mean high tide line where possible to reduce impacts on the upper beach, and fencing supplies would be carried from the ATV to the fencing areas on foot where possible. Motorboat operation would be used daily to transport and rotate biological staff and bring field supplies. Once reaching South Monomoy, personnel would complete tern management activities (install productivity plots and check daily) in the tern colony by foot. To minimize predator disturbance, non-lethal methods (including staffing camp 24 hours and using chick shelters within the nesting areas) and lethal methods (such as shooting) of predator control will be conducted in the colony with the use of six plywood blinds. Field camp will include four large wall tents and two small tents that provide facilities for sleeping, cooking, privacy sanitation, and storage of supplies for up to eight individuals. At the end of the season, all materials and equipment (including symbolic fencing, field camp, blinds, nesting/chick shelters, flagging and pvc from grid system) would be removed and stored in both wilderness and non-wilderness locations.

Effects:

Wilderness Character

"Untrammeled"
No Benefits
Adverse Effects

- The action to use nesting/chick shelters and prevent natural predators from preying on the nests or chicks represents a trammeling of the wilderness
- The action to use nesting shelters as artificial habitat represents a trammeling of the wilderness.
- The action of removing natural predators for the habitat represents a trammeling of the wilderness.

"Undeveloped"
No Benefits
Adverse Effects

- Using mechanized transportation in wilderness is inconsistent with the requirement to retain the primeval character of wilderness.
- The temporary installation of symbolic fencing, nesting boxes, chick shelters, field camp, blinds, and sound system will have a negative effect on the undeveloped quality of the wilderness.

"Natural"
Benefits

- Naturalness be will improved by protecting and conserving an endangered wildlife species – a part of the natural character of the wilderness.
- Manipulating the habitat through use of nesting/chick shelters will preserve native species.

No Adverse Effects

- The active management to increase roseate tern populations and protect roseate and common terns from predators will have a negative effect on the natural quality of the wilderness.

"Outstanding opportunities for solitude or a primitive and unconfined type of recreation"
No Benefits
Adverse Effects

- Area closures and enforcement and temporary structures would be present and visible during the roseate tern and common tern breeding season and may be perceived by some wilderness users as "confining" the wilderness experience. Refuge personnel, ATVs, and motorboats would be visually and audibly evident and may be perceived by some Monomoy Wilderness users as intruding on solitude.

Other unique components that reflect the character of this wilderness
Benefits

- The beach/dune nesting roseate and common tern populations are unique ecological featurea with scientific, educational, and scenic value to current and future generations of Americans.

Heritage and Cultural Resources
N/A

Maintaining Traditional Skills
No Benefits
Adverse Effects

- Using mechanized transportation in wilderness does not enhance the contracts between wilderness and non-wilderness or perpetuate the use of primitive traditional skills.

Special Provisions
N/A

Economic and Time Constraints
Benefits

- Roseate and common tern management would be conducted in a time-saving, efficient manner.

Adverse Effects

- Added costs of ATV purchase, boat and ATV equipment operation and maintenance, personnel training, and personal protective equipment.
- Cost of training personnel on lethal predator control use

Additional Wilderness-specific Comparison Criteria

N/A

Safety of Visitors, Personnel, and Contractors

Benefits

- Locating injured or ill persons needing medical evacuation is easier if an ATV is available. Medical emergency evacuations are potentially much faster when an ATV and motorboat are available (Section 4-C of Wilderness Policy).

Adverse Effects

- Risks associated with ATV use can be partially mitigated by training, maintenance, and personal protective equipment (PPE), but personnel injury could potentially increase.
- People on foot are much less mobile and are therefore exposed and vulnerable to the weather, environmental hazards, and dehydration for longer durations.
- Risks associated with predator control can be mitigated by training.

Alternative # B – Partial Motor Option A

Description:

Use motorboats to access all areas of the island; build temporary structures and installations, including field camp, blinds, symbolic fencing, nesting structures, chick shelters, sound system and decoys, productivity plots, and grid markers; conduct predator control (referred to as Partial Motor Option A).

Under this alternative, biological staff will travel to the South Monomoy boat landing by motorboat every other day from the beginning of April to mid-August, work all daylight hours, and rotate staff. Prior to the nesting season, a motorboat would be used to carry materials to drop off all gear, supplies, and equipment to set up a temporary field camp within the wilderness boundary that would remain in place for the entire season and to establish the grid system. Staff would carry and set up symbolic fencing to keep people out of potential nesting areas. During this time temporary wooden nesting/chick structures (providing shade, cover and artificial habitat), decoys, and sound system (two speakers, box containing cd player, battery and sound equipment, solar panel decoys) would be installed in the colony to attract nesting roseate terns during the start of the nesting season. The sound system will be operated during daylight use only and manually turned on and off by on-island personnel. Once reaching South Monomoy, personnel would complete tern management activities (install productivity plots and check 50 percent of plots on alternating days) in the tern colony by foot. To minimize predator disturbance, non-lethal methods (including staffing camp 24 hours and using chick shelters within the nesting areas) and lethal methods (such as shooting) of predator control will be conducted in the colony with the use of four plywood blinds. Field camp will include two large wall tents and one small tent that provide facilities for sleeping, cooking, privacy sanitation, and storage of supplies for up to six individuals. At the end of the season, all materials and equipment (including symbolic fencing, field camp, blinds, nesting/chick shelters, flagging and pvc from grid system) would be removed and stored in both wilderness and non-wilderness locations.

Effects:

Wilderness Character

"Untrammeled"

No Benefits

Adverse Effects

- The action to use nesting/chick shelters and prevent natural predators from preying on the nests or chicks represents a trammeling of the wilderness.
- The action to use nesting shelters as artificial habitat represents a trammeling of the wilderness.
- The action of removing natural predators for the habitat represents a trammeling of the wilderness.

"Undeveloped"

No Benefits

Adverse Effects

- Using motorboats in wilderness is inconsistent with the requirement to retain the primeval character of wilderness.
- The temporary installation of symbolic fencing, nesting boxes, chick shelters, field camp, blinds, and sound system will have a negative effect on the undeveloped quality of the wilderness.

"Natural"

Benefits

- Naturalness will be improved by protecting and conserving an endangered wildlife species – a part of the natural character of the wilderness.
- Manipulating the habitat through use of nesting/chick shelters will preserve native species.

No Adverse Effects

- The active management to increase roseate tern populations and protect roseate and common terns from predators will have a negative effect on the natural quality of the wilderness.

"Outstanding opportunities for solitude or a primitive and unconfined type of recreation"

No Benefits

Adverse Effects

- Area closures and enforcement and temporary structures would be present and visible during the roseate tern and common tern breeding season and may be perceived by some wilderness users as "confining" the wilderness experience. Refuge personnel and motorboats would be visually and audibly evident and may be perceived by some Monomoy Wilderness users as intruding on solitude.

Other unique components that reflect the character of this wilderness

Benefits

- The beach/dune nesting roseate and common tern populations are unique ecological features with scientific, educational, and scenic value to current and future generations of Americans.

Heritage and Cultural Resources
N/A

Maintaining Traditional Skills
Benefits
- Use of motorboats helps to maintain traditional skills throughout the wilderness.

Adverse Effects
- Use of motorboats in wilderness does not enhance the contracts between wilderness and non-wilderness or perpetuate the use of primitive traditional skills.

Special Provisions
N/A

Economic and Time Constraints
Benefits
- Roseate and common tern management would be conducted in a time-saving, efficient manner.

Adverse Effects
- Costs of boat operation and maintenance and personnel training.
- Cost to train personnel on lethal predator control.

Additional Wilderness-specific Comparison Criteria
N/A

Safety of Visitors, Personnel, and Contractors
No Benefits
Adverse Effects
- People on foot are much less mobile and are therefore exposed and vulnerable to the weather, environmental hazards, and dehydration for longer durations.
- Risks associated with predator control can be mitigated by training.

Alternative # C – Partial Motor Option B

Description:

Use motorboats to access all areas of the island; build temporary structures and installations including spike camp, blinds, symbolic fencing, nesting structures, chick shelters, sound system and decoys, productivity plots, and grid markers; conduct predator control (referred to as the Partial Motor Option B).

Under this alternative, biological staff will travel to South Monomoy boat landing by motorboat every other day from the beginning of April to mid-August and work all daylight hours. Prior to the nesting season, a motorboat

would be used to carry materials to drop off all gear, supplies, and equipment to set up a temporary field camp (non-wilderness) and a spike camp within the wilderness boundary that would remain in place for the entire season and to establish the grid system. Staff would carry and set up symbolic fencing to keep people out of potential nesting areas. During this time temporary wooden nesting/chick structures (provide shade, cover and artificial habitat), decoys, and sound system (two speakers, box containing cd player, battery and sound equipment, solar panel decoys) would be installed in the colony to attract nesting roseate terns during the start of the nesting season. The sound system will be operated during daylight use only and manually turned on and off by on-island personnel. Once reaching South Monomoy, personnel would complete tern management activities (install productivity plots and check half of the plots on alternating days) in the tern colony by foot. To minimize predator disturbance, non-lethal methods (including staffing camp 24 hours and using chick shelters within the nesting areas) and lethal methods (such as shooting) of predator control will be conducted in the colony with the use of four plywood blinds. Field camp would have unlimited staff and the spike camp will include one small tent to provide a 24 hour presence near the tern colony. At the end of the season, all materials and equipment (including symbolic fencing, field camp, "spike" camp, blinds, nest/chick shelters, flagging and pvc from grid system) would be removed and stored in both wilderness and non – wilderness locations.

Effects:

Wilderness Character

"Untrammeled"

No Benefits

Adverse Effects

- The action to use nesting/chick shelters and prevent natural predators from preying on the nests and chicks represents a trammeling of the wilderness.
- The action to use nest shelters as artificial habitat represents a trammeling of the wilderness.
- The action of removing natural predators for the habitat represents a trammeling of the wilderness.

"Undeveloped"

No Benefits

Adverse Effects

- Using motorboats in wilderness is inconsistent with the requirement to retain the primeval character of wilderness.
- The temporary installation of symbolic fencing, nesting boxes, chick shelters, spike camp, blinds, and sound system will have a negative effect on the undeveloped quality of the wilderness.

"Natural"

Benefits

- Naturalness will be improved by protecting and conserving an endangered wildlife species – a part of the natural character of the wilderness.
- Manipulating the habitat through use of nesting/chick shelters will preserve native species.

No Adverse Effects

- The active management to increase roseate tern populations and protect roseate and common terns from predators will have a negative effect on the natural quality of the wilderness.

"Outstanding opportunities for solitude or a primitive and unconfined type of recreation"
No Benefits
Adverse Effects

- Area closures and enforcement and temporary structures would be present and visible during the roseate tern and common tern breeding season and may be perceived by some wilderness users as "confining" the wilderness experience. Refuge personnel and motorboats would be visually and audibly evident and may be perceived by some Monomoy Wilderness users as intruding on solitude.

Other unique components that reflect the character of this wilderness
Benefits

- The beach/dune-nesting roseate and common tern populations are a unique ecological feature with scientific, educational, and scenic value to current and future generations of Americans.

Heritage and Cultural Resources
N/A

Maintaining Traditional Skills
Benefits

- Use of motorboats helps to maintain traditional skills throughout the wilderness

Adverse Effects

- Use of motorboats in wilderness does not enhance the contracts between wilderness and non-wilderness or perpetuate the use of primitive traditional skills.

Special Provisions
N/A

Economic and Time Constraints
Benefits

- Roseate and Common Tern management would be conducted in a time-saving, efficient manner.

Adverse Effects

- Cost of boat operation and maintenance, and personnel training.
- Cost to train personnel on lethal predator control use.

Additional Wilderness-specific Comparison Criteria
N/A

Safety of Visitors, Personnel, and Contractors

No Benefits

Adverse Effects

- People on foot are much less mobile and therefore exposed and vulnerable to the weather, environmental hazards and dehydration for longer durations.
- Risks associated with predator control can be mitigated by training.

Alternative # D – No Motor Option

Description:

Use no motor vehicles; mechanized equipment will be used if loads exceed 80lbs and/or exceed three trips per person on foot; build temporary structures and installations including field camp, blinds, symbolic fencing, nesting structures, chick shelters, sound system and decoys, productivity plots, and grid markers; conduct predator control; install symbolic fencing to decrease human disturbance; manipulate habitat; conduct predator control (referred to as the No *Motor* Option).

Under this alternative, biological staff will travel to South Monomoy by paddling kayaks from the mainland, weather permitting, from early April to mid-August and work all daylight hours. Personnel return in the same manner at the end of their field base assignment (10 days on/4-days off schedule). Prior to the nesting season, a motorboat would be used to carry materials to drop off in non-wilderness all gear, supplies, and equipment to set up a temporary field camp within the wilderness boundary that would remain in place for the entire season and to establish the grid system. If any load exceeds 80lbs and/or three trips per person on foot, a wheeled cart will be used. Staff would carry and set up symbolic fencing to keep people out of potential nesting areas. During this time temporary wooden nesting/chick structures (provide shade, cover and artificial habitat), decoys, and sound system (two speakers, box containing cd player, battery, and sound equipment, solar panel decoys) would be installed in the colony to attract nesting roseate terns during the start of the nesting season. The sound system will be operated during daylight use only and manually turned on and off by on island staff personnel. Once reaching the colony on South Monomoy, personnel would complete tern management activities (every other year install productivity plots and check daily) in the tern colony by foot. To minimize predator disturbance non-lethal methods (including staffing camp 24 hours and using chick shelters within the nesting areas) and lethal methods (such as shooting) of predator control will be conducted in the colony with the use of four pop-up blinds that are removed when not in use. Field camp will include four individual pup tents and a sanitation tent; cooking would be conducted outdoors, and use more wilderness-friendly backpacking gear. If camp is closed during the season for any reason, all gear (personal and safety) will be removed from the camp area. At the end of the season, all materials and equipment (including symbolic fencing, blinds, nesting/chick shelters, flagging, and pvc from grid system) would be removed and stored in both wilderness and non-wilderness locations.

Effects:

Wilderness Character

"Untrammeled"

No Benefits

Adverse Effects

- The action to use nesting/chick shelters and prevent natural predators from preying on the nests and chicks represents a trammeling of the wilderness.
- The action to use nest shelters as artificial habitat represents a trammeling of the wilderness.
- The action of removing natural predators for the habitat represents a trammeling of the wilderness.

"Undeveloped"

No Benefits

Adverse Effects

- The temporary installation of symbolic fencing, nesting boxes, chick shelters, field camp, and blinds will have a negative effect on the undeveloped quality of the wilderness.

"Natural"

Benefits

- Naturalness will improve by protecting and conserving an endangered wildlife species – a part of the natural character of the wilderness.
- Manipulating the habitat through use of nesting/chick shelters will preserve native species.

No Adverse Effects.

- Use of nonmotorized transportation would extend the time needed to conduct management activities in wilderness and, therefore, could negatively affect productivity and habitat improvement.

"Outstanding opportunities for solitude or a primitive and unconfined type of recreation"

No Benefits

Adverse Effects

- Area closures and enforcement and temporary structures would be present and visible during the roseate tern and common tern breeding season and may be perceived by some wilderness users as "confining" the wilderness experience.
- Refuge personnel and motorboats would be visually and audibly evident and may be perceived by some Monomoy Wilderness users as intruding on solitude.

Other unique components that reflect the character of this wilderness

Benefits

- The beach/dune-nesting roseate and common tern populations are a unique ecological feature with scientific, educational, and scenic value to current and future generations of Americans.

Heritage and Cultural Resources

N/A

Maintaining Traditional Skills

Benefits

- Use of nonmechanized modes of transportation in wilderness enhances the contrast between wilderness and non-wilderness and perpetuates the use of primitive traditional skills.

No Adverse Effects

Special Provisions

N/A

Economic and Time Constraints

No Benefits

Adverse Effects

- Cost to train personnel on kayak use.
- Cost to hire/acquire more staff.
- Cost to obtain more kayaks, safety equipment, and other personal equipment to support adequate job duty performance.
- Time required to travel by kayak to island.
- Cost to train personnel on lethal predator control use.

Additional Wilderness-specific Comparison Criteria

N/A

Safety of Visitors, Personnel, and Contractors

No Benefits

Adverse Effects

- People on foot or paddling are much less mobile and therefore exposed and vulnerable to the weather, adverse sea and tidal current conditions, and environmental hazards for longer durations.
- Carrying all gear and paddling increases one's risk for heart attack and dehydration.
- Risk associated with kayak use can be partially mitigated by training.
- A higher level of physical fitness is required. Risks can be partially mitigated by conditioning, personnel selection, and providing personal protective equipment and Go/No-Go criteria.
- Medical emergency evacuations are potentially much faster when a motorboat is available than individuals traveling on foot or paddling. Greater reliance on maritime aerial medical evacuation is required, an already scarce emergency service resource in the area that is not always available when needed (See section 4-C of Wilderness policy).

Alternative # E- No Action

The roseate tern is a listed endangered species and its protection is mandated under the Endangered Species Act. In order to successful manage for roseate terns, a common tern colony must be managed. A "no action" alternative cannot be selected in a Minimum Requirements Analysis. Therefore, this alternative was not analyzed.

Comparison of Alternatives
It may be useful to compare each alternative's positive and negative effects to each of the criteria in tabular form, keeping in mind the law's mandate to "preserve wilderness character."

	Alternative A	Alternative B	Alternative C	Alternative D
Untrammeled	- -	- -	--	- -
Undeveloped	- - - -	- - -	---	-
Natural	+/-	+/-	+/-	+/-
Solitude or primitive recreation	-	-	-	-
Unique components	+	+	+	+
WILDERNESS CHARACTER	++/--------	++/-------	++/-------	++/-----

	Alternative A	Alternative B	Alternative C	Alternative D
Heritage & Cultural Resources	NA	NA	NA	NA
Maintaining Traditional Skills	- -	+/ -	+/-	+
Special Provisions	NA	NA	NA	NA
Economics & Time	+/- -	+/- -	+/---	- - -
Additional Wilderness Criteria	NA	NA	NA	NA
OTHER CRITERIA SUMMARY	+/----	++/---	++/----	+/---

	Alternative A	Alternative B	Alternative C	Alternative D
SAFETY	Partially Mitigated	Mitigated	Mitigated	Partially Mitigated

Safety Criterion
If safety issues override impacts to wilderness character or other criteria, provide documentation that the use of motorized equipment or other prohibited uses is necessary because to do otherwise would cause increased risks to workers or visitors that cannot be satisfactorily mitigated through training, use of personal protective equipment (PPE), or other requirements to alleviate the safety risk. (This documentation can take the form of agency accident-rate data tracking occurrences and severity; a project-specific job hazard analysis; research literature; or other specific agency guidelines.)

Documentation:

Step 2 Decision: What is the Minimum Activity?

Please refer to the accompanying Minimum Requirements Decision Guide *Instructions* **before describing the selected alternative and describing the rationale for selection.**

Selected alternative: Alternative B - Partial Motor Option A

Rationale for selecting this alternative (including documentation of safety criterion, if appropriate):
Alternative B, Partial Motor Option A, adequately protects and conserves roseate terns and common terns while minimizing the negative impacts to the wilderness character of the Monomoy Wilderness. The alternative does so by limiting the use of motor vehicles and using time and economics efficiently to monitor roseate and common terns. The Partial Motor Option A alternative best protects the wilderness quality and meets the requirements of the Endangered Species Act, as well as best satisfies the other comparison criteria.

	Alternative A	Alternative B	Alternative C	Alternative D
Untrammeled	- -	- -	--	- -
Undeveloped	- - - -	- - -	---	-
Natural	+/-	+/-	+/-	+/-
Solitude or Primitive Recreation	-	-	-	-
Unique components	+	+	+	+
WILDERNESS CHARACTER	++/--------	++/-------	++/-------	++/-----

	Alternative A	Alternative B	Alternative C	Alternative D
Heritage & Cultural Resources	NA	NA	NA	NA
Maintaining Traditional Skills	- -	+/ -	+/-	+
Special Provisions	NA	NA	NA	NA
Economics & Time	+/- -	+/- -	+/---	- - -
Additional Wilderness Criteria	NA	NA	NA	NA
OTHER CRITERIA SUMMARY	+/----	++/---	++/----	+/---

	Alternative A	Alternative B	Alternative C	Alternative D
SAFETY	Partially Mitigated	Mitigated	Mitigated	Partially Mitigated

Monitoring and reporting requirements:
Monitoring and reporting of the operations associated with the nesting and protection project will continue on a yearly basis. This information will be maintained in the Monomoy NWR headquarters and will be available for review by anyone interested.

Check any Wilderness Act Section 4(c) uses approved in this alternative:

- [x] mechanical transport
- [ ] motorized equipment
- [ ] motor vehicles
- [x] motorboats
- [ ] landing of aircraft
- [ ] temporary road
- [ ] structure or installation

Record and report any authorizations of Wilderness Act Section 4(c) uses according to agency procedures.

Approvals	Signature	Name	Position	Date
Prepared by:				
Recommended:				
Recommended:				
Approved:				