Appendix B

USFWS

Visitors paddle along Sunkhaze Stream at Sunkhaze Meadows National Wildlife Refuge.

Findings of Appropriateness and Compatibility Determinations

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Sunkhaze Meadows NWR

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COMPATIBILITY DETERMINATION

USE: Wildlife Observation and Photography, Environmental Education and Interpretation

REFUGE NAME: Sunkhaze Meadows National Wildlife Refuge

DATE ESTABLISHED: November 22, 1988

ESTABLISHING AUTHORITIES:

1. Fish and Wildlife Act of 1956 (16 U.S.C. 742a-742j; 70 Stat. 1119)

2. Refuge Recreation Act of 1962 (16 U.S.C. 460k-406k-4; 76 Stat. 653)

PURPOSE(S) FOR WHICH ESTABLISHED:

1. "... for the development, advancement, management, conservation, and protection of fish and wildlife resources ..." (16 U.S.C. 742f(a)(4)) "... for the benefit of the United States Fish and Wildlife Service, in performing it activities and services. Such acceptance may be subject to the terms of any restrictive or affirmative covenant, or condition of servitude ..." ((16 U.S.C. 742f(b)(1) (Fish and Wildlife Act of 1956))

2. "... suitable for -- (1) incidental fish and wildlife-oriented recreational development, (2) the protection of natural resources, (3) the conservation of endangered species or threatened species ..." ((16 U.S.C. 460k-1) (Refuge Recreation Act))

MISSION OF THE NATIONAL WILDLIFE REFUGE SYSTEM:
"To administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife and plant resource and their habitats within the United States for the benefit of present and future generations of Americans." (16 U.S.C. 668dd-668ee) (National Wildlife Refuge System Administration Act of 1966)

DESCRIPTION OF USE:

(a) What are the uses? Are they priority public uses?
The uses are wildlife observation, photography, environmental education, and interpretation. These four uses are among the six priority public uses of the National Wildlife Refuge System under the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd-668ee), and the National Wildlife Refuge System Improvement Act of 1997 (Public Law 105-57).

(b) Where will the uses be conducted?
Wildlife observation, photography, environmental education and interpretation will be allowed to occur throughout the Sunkhaze Meadows National Wildlife Refuge (NWR, refuge), including the Sunkhaze Unit, Benton Unit, and Sandy Steam Unit, during open hours. Designated trails exist on the various units and most visitor use is focused on and around these trails. Visitors also use canoes or kayaks to access the various streams and other wetland areas within the refuge. There is one elevated structure at the end of the Carter Meadow Trail to provide a panoramic

view of the wetland, but no structures provided specifically as photography blinds, as none of the refuge's units have high concentrations of wildlife in a given location. The exact locations of environmental education and interpretation activities and events by outside groups will be at the discretion of the refuge manager through required special use permits (SUP).

(c) When will the uses be conducted?

Wildlife observation, photography, environmental education and interpretation will be allowed on all the units of the Sunkhaze Meadows NWR daily, year-round, from sunrise to sunset, unless a conflict with a management activity or an extenuating circumstance necessitates deviating from this. Closures for snow or ice storms, or other events affecting human safety, or for nesting season and other sensitive times of the year are examples of times when the refuge may require these uses be temporarily suspended or require temporary spatial closures of certain areas.

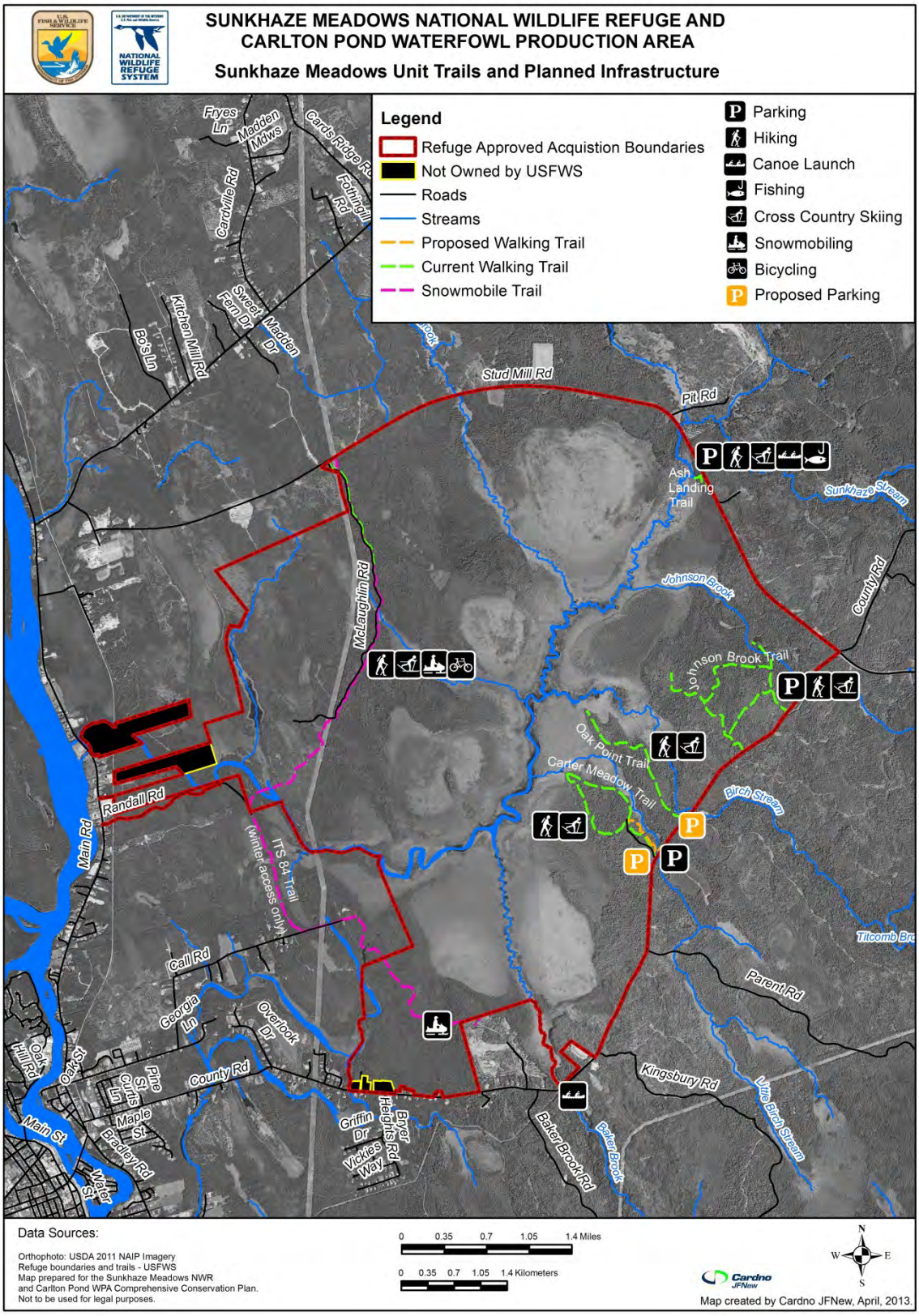
(d) How will the uses be conducted?

Refuge staff will be responsible for providing law enforcement; maintaining boundaries and signs; meeting with adjacent landowners and the interested public or responding to their inquiries; recruiting and supervising volunteers; preparing information on these uses to be delivered via Web sites, brochures, and other means; developing necessary signs; monitoring and evaluating impacts; regulating the use of the area by groups through SUPs; and, if sufficient staff exists, preparing and delivering environmental education and interpretation programs. Visitors participating in approved public uses are allowed off-trail; however, off-trail use is limited to pedestrian access only (e.g., walking, snowshoeing, skiing).

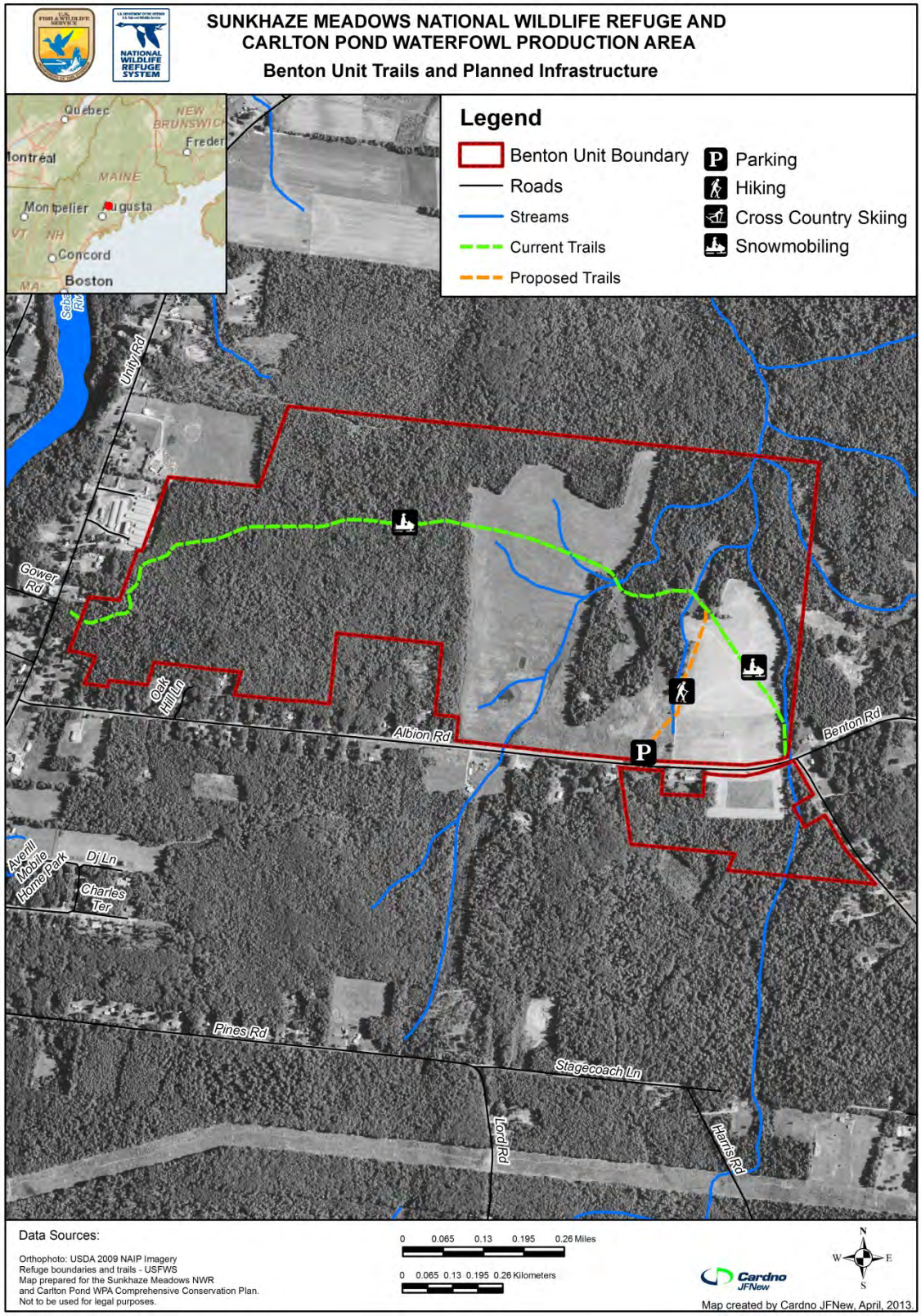
(e) Why are these use(s) being proposed?

Wildlife observation, wildlife photography, environmental education, and interpretation are priority public uses as defined by the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C 668dd-668ee), and the National Wildlife Refuge System Improvement Act of 1997 (Public Law 105-57). If compatible, they are to be facilitated on refuges. These uses will be conducted to provide compatible educational and recreational opportunities for visitors to enjoy the resources and to gain understanding and appreciation for fish and wildlife and habitats, ecology and wildlife management. These uses provide opportunities for visitors to relax and enjoy wildlife in a wholesome, safe, unstructured outdoor environment at their own pace, and to provide the psychological and health benefits attendant to that type of outdoor enjoyment. As visitors enjoy the recreational aspects of these activities, they may be drawn to engage in the more structured educational opportunities offered, and thereby, enhance their understanding of natural resource management programs and ecological concepts. This, in turn, will enable them to better understand ecological issues and problems affecting refuge resources and become better advocates and stewards for those resources. Photographs that are taken on refuges are sometimes shared with others by the photographer or shared with the refuge staff and donated for use in U.S. Fish and Wildlife Service outreach materials and can provide the public increased exposure to refuge assets.

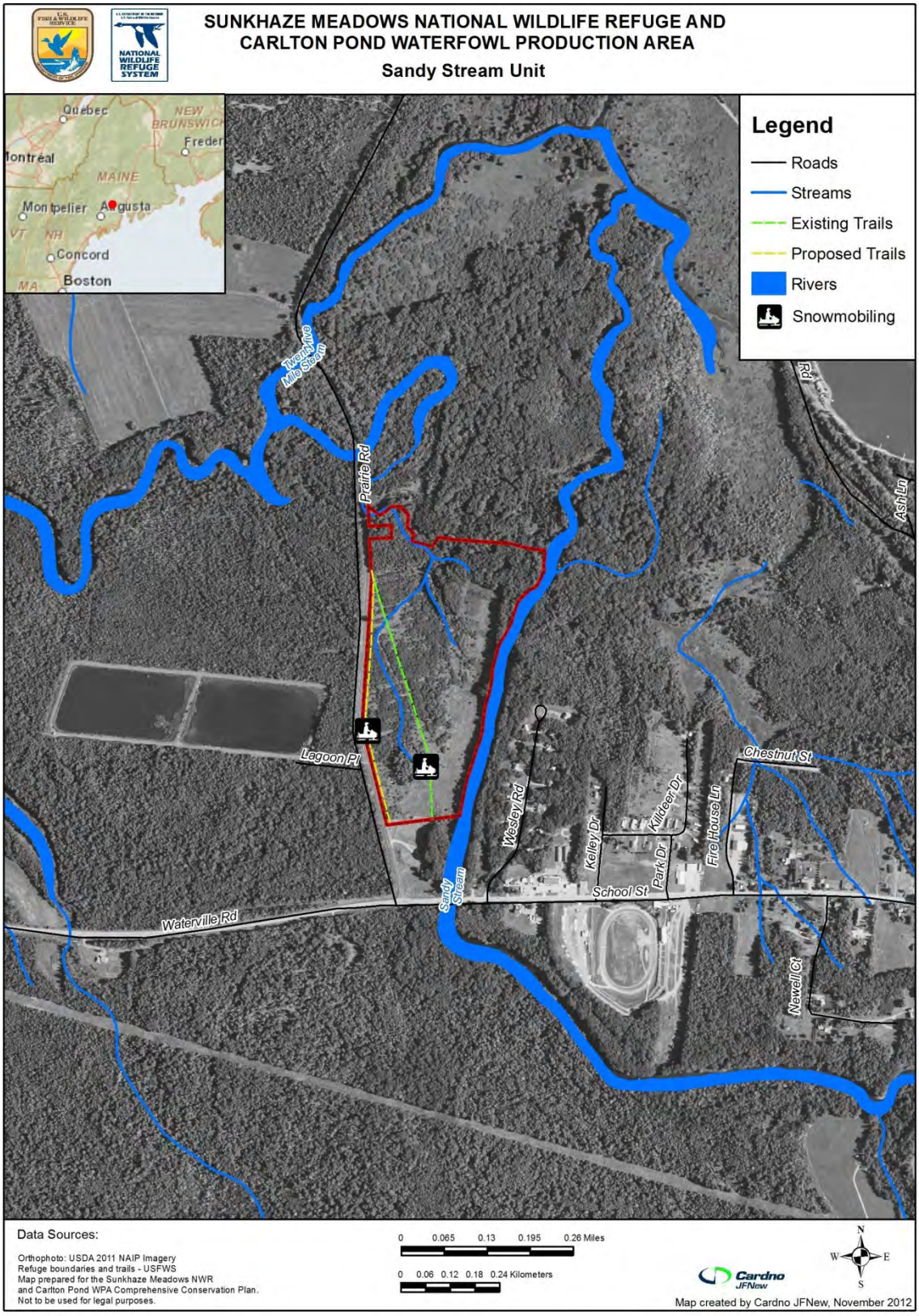
Map B.1. Current and proposed infrastructure for the Sunkhaze Meadows Unit of Sunkhaze Meadows NWR.



Map B.2. Current and planned infrastructure for the Benton Unit of Sunkhaze Meadows National Wildlife Refuge.



Map B.3. Current and planned infrastructure within the Sandy Stream Unit of Sunkhaze Meadows NWR.



AVAILABILITY OF RESOURCES:
Sufficient refuge resources in terms of personnel and budget are available to administer these uses.

Cost Breakdown
The following are estimated costs to the refuge to administer and manage the refuge programs for wildlife observation, wildlife photography, environmental education, and interpretation.

Maintenance:	$5,000	annually to maintain kiosks, trails and parking lots
Install improved signs:	$3,000	one-time expense
Monitoring:	$2,000	annual
Law Enforcement:	$6,000	annual
Estimated Total:	**$16,000**	

ANTICIPATED IMPACTS OF THE USE:
Wildlife observation and photography, environmental education, and interpretation can have positive or negative impacts to the refuge's wildlife and habitats.

In general, visitors engaged in these uses will be traveling by foot, either by walking or hiking, in designated areas and along designated trails and roads. The positive impacts of these uses include providing visitors with a better appreciation and more complete understanding of the wildlife and habitats associated with the refuge. This can translate into more widespread and stronger support for the refuge, the National Wildlife Refuge System, and the Service, as well as wildlife conservation in general.

The negative effects of these uses include impacts to plants, soils, hydrology, and wildlife from both visitors walking and hiking on the refuge and from building and maintaining public use facilities.

Vegetation Impacts:
Pedestrian travel can have indirect impacts to plants by compacting soils and diminishing soil porosity, aeration, and nutrient availability that affect plant growth and survival (Kuss 1986). Hammitt and Cole (1998) note that compaction limits the ability of plants to re-vegetate affected areas. Repeated foot travel can directly impact plants by crushing the plants themselves. Rare plants with limited site occurrence are particularly susceptible to such impacts. Plants growing in wet or moist soils are the most sensitive to disturbance from trampling effects (Kuss 1986). Moist and wet soil conditions are present at the refuge, particularly during spring and early summer.

It is anticipated that allowing this use will cause vegetation loss on designated routes. Foot travel may increase root exposure and trampling effects; however, refuge staff have only observed minimal impacts to refuge vegetation associated with current use because most visitors remain on established roads and trails. Designated routes for pedestrian travel consist of existing trails, many with hardened surfaces or are existing trails that have been used for many years.

For these reasons, we expect only negligible increases in impacts to this resources associated with the projected moderate increase in use. Refuge staff will monitor trails and refuge lands. If any problem areas are identified, we will take the appropriate restoration and protection measures.

Designated routes do not have any known occurrences of rare plant species on their surface that will be impacted by this use. Continuing pedestrian travel on these routes is not likely to cause any significant impacts to plants or plant communities.

People can be vectors for invasive plants when seeds or other propagules are moved from one area to another. Once established, invasives can out-compete native plants, thereby altering habitats and indirectly impacting wildlife. The threat of invasive plant establishment will always be an issue requiring annual monitoring, and when necessary, treatment. Staff will work to educate the visiting public to reduce introductions and will also monitor and control invasives.

Soils Impacts:
Soils can be compacted and eroded as a result of continued use of pedestrian routes (Cole and Landres 1995). It is anticipated that some soil erosion will occur as a result of continuing pedestrian access on designated routes. Under current levels of use, impacts to soils (erosion, compaction) are not likely to be significant.

Hydrologic Impacts:
Roads and trails can affect the hydrology of an area, primarily through alteration of drainage patterns. It is anticipated that existing roads and trails will continue to influence hydrology regardless of pedestrian travel. Maintenance will be required to create adequate and proper drainage to avoid hydrologic impacts. Trail construction may also cause erosion and run-off of sediment into nearby waterways from exposed soils.

Since all the units of the refuge are fairly flat, erosion is not a large problem, but impacts to wet areas can occur when bridging is inadequate and visitors widen or go off the trail to avoid wet spots. Properly sited, designed, and maintained trails minimize this impact. Based on the current level of use, pedestrian travel is not likely to significantly increase erosion, incision, or stream alteration. Therefore, no significant hydrologic impacts are anticipated from this use.

Habitat Impacts:
Peatlands are particularly vulnerable to damage by visitors who may walk through them or collect plants. At Sunkhaze Meadows NWR, the peatlands are difficult to access due to the large area of wetlands that exist between the streams and the peat domes; there are no designated trails to access these sensitive areas. Plant collecting is also prohibited. Visitors wishing to see a bog can visit the boardwalks that access the nearby Orono Bog.

Wildlife Impacts:
Disturbances vary with the wildlife species involved and the type, level, frequency, duration and the time of year such activities occur. The responses of wildlife to human activities includes: avoidance or departure from the site (Owen 1973, Burger 1981, Kaiser and Fritzell 1984, Korschen et al. 1985, Henson and Grant 1991, Kahl 1991, Klein 1993, Whittaker and Knight 1998), use of sub-optimal habitat (Erwin 1980, Williams and Forbes 1980), altered behavior or

habituation to human disturbance (Burger 1981, Korschen et al. 1985, Morton et al. 1989, Ward and Stehn 1989, Havera et al. 1992, Klein 1993), attraction (Whittaker and Knight1998), and an increase in energy expenditure (Morton et al. 1989, Belanger and Bedard 1990). Knight and Cole (1991) suggest recreational activities occurring simultaneously may have a combined negative impact on wildlife. Hammitt and Cole (1998) conclude that the frequent presence of humans in wildland areas can dramatically change the normal behavior of wildlife mostly through "unintentional harassment." These responses can have negative impacts to wildlife such as mammals becoming habituated to humans making them easier targets for hunters. Human induced avoidance by wildlife can prevent animals from using otherwise suitable habitat. Seasonal sensitivities can compound the effect of disturbance on wildlife. Examples include regularly flushing birds during nesting or causing mammals to flee during winter months, thereby consuming large amounts of stored fat reserves. Some uses, such as bird observation, are directly focused on viewing certain wildlife species and can cause more significant impacts during the breeding season and winter months.

Impacts on Birds

Trails can disturb wildlife outside the immediate trail corridor (Trails and Wildlife Task Force 1998, Miller et al. 2001). Miller et al. (1998) found bird abundance and nesting activities (including nest success) increased as distance from a recreational trail increased in both grassland and forested habitats. Bird communities in this study were apparently affected by the presence of recreational trails, where "generalists" (e.g., American robins (*Turdus migratorius*)) were found near trails and "specialist" species (e.g., grasshopper sparrows (*Ammodramus savannarum*)) were found farther from trails. Nest predation was also found to be greater near trails (Miller et al. 1998).

Visitors engaged in wildlife observation, photography, environmental education, and interpretation have the potential to impact shorebird, waterfowl, and other migratory bird populations feeding and resting near the trails during certain times of the year. Human disturbance to migratory birds has been documented in many studies in different locations. Conflicts arise when migratory birds and humans are present in the same areas (Boyle and Samson 1985). McNeil et al. (1992) found that many waterfowl species avoid disturbance by feeding at night instead of during the day. Flight in response to disturbance can lower nesting productivity and cause disease and death.

Studying the effects of human visitation on waterbirds at J.N. "Ding" Darling Refuge, Klein (1989) found resident waterbirds to be less sensitive to disturbance than migrants; she also found that sensitivity varied according to species and individuals within species. Herons and bitterns were quite tolerant of people; however, the presence of people did disturb these birds when hunting terrestrial prey. Great blue herons (*Ardea herodias*), tricolored herons (*Egretta tricolor*), great egrets (*Casmerodius albus*), and little blue herons (*Egretta caerulea*) were disturbed to the point of flight more than other birds. Kushlan (1978) found that the need of these birds to move frequently while feeding may disrupt interspecific and intraspecific relationships. In addition, Batten (1977) and Burger (1981) found that wading birds were extremely sensitive to disturbance in the northeastern United States.

Klein (1993), in studying waterbird response to human disturbance, found that as intensity of disturbance increased, avoidance response by the birds increased and that out-of-vehicle activity to be more disruptive than vehicular traffic; Freddy et al. (1986) and Vaske et al. (1983) also found the latter to be true. In regards to waterfowl, Klein (1989) found migratory dabbling ducks to be the most sensitive to disturbance and migrant ducks to be more sensitive when they first arrived in the late fall, than later in winter. She also found gulls and sandpipers to be apparently insensitive to human disturbance, with Burger (1981) finding the same to be true for various gull species.

For songbirds, Gutzwiller et al. (1994) found that singing behavior of some species was altered by low levels of human intrusion. Some studies have found that some bird species habituate to repeated intrusion; frequently disturbed individuals of some species have been found to vocalize more aggressively, have higher body masses, or tend to remain in place longer (Cairns and McLaren 1980). Disturbance may affect the reproductive fitness of males by hampering territory defense, male attraction, and other reproductive functions of song (Arcese 1987). Disturbance, which leads to reduced singing activity, will make males rely more heavily on physical deterrents in defending territories which are time and energy consuming (Ewald and Carpenter 1978).

Several studies have examined the effects of recreationists on birds using shallow-water habitats adjacent to trails and roads in the eastern United States (Burger 1981, Burger 1986, Klein 1993, Burger et al. 1995, Klein et al. 1995, Rodgers and Smith 1995, 1997, Burger and Gochfeld 1998). Overall, the existing research clearly demonstrates that disturbance from recreation activities has at least temporary effects on the behavior and movement of birds within a habitat or localized area.

Research has shown that: 1) birds avoided places where people were present and when visitor activity was high (Burger 1981, Klein et al. 1995, Burger and Gochfeld 1998); 2) bird disturbance increased with decreased distance between visitors and species (Burger 1986), though exact measurements were not reported.; 3) visitors directly approaching birds on foot caused more disturbance than visitors driving by in vehicles, stopping vehicles near birds, and stopping vehicles and getting out without approaching birds (Klein 1993); 4) speed and type of pedestrian activity affects bird disturbance, e.g., joggers and landscapers caused birds to flush more than fishermen, clammers, sunbathers, and some pedestrians, possibly because the former groups move quickly (joggers) or create more noise (landscapers) (Burger 1981, 1986, Burger et al. 1995, Knight and Cole 1995); and 5) noise caused by visitors resulted in increased levels of bird disturbance (Burger 1986, Klein 1993, Burger and Gochfeld 1998).

Overall adverse impacts birds are expected to be minimal. These are ongoing uses of the refuge, and Service staff have not observed unacceptable adverse effects on refuge resources. Refuge use is currently low and increases in use will be monitored by Service staff to ensure impacts to wildlife are minimal. Most of the use is spread out over the 11,484-acre Sunkhaze Meadows Unit, the largest refuge unit. This minimizes potential adverse impacts on birds. Most boat use is non-motorized, and Service staff are not aware of excessive disturbance associated with this

activity. Most visitors participating in these activities are alone, or in small groups (less than 10 people).

Organized environmental education or interpretation activities (e.g., nature walks, canoe trips with multiple canoes) are more likely to involve larger groups. Because larger groups are more likely to disturb habitats and wildlife, we will require program leaders to obtain a SUP prior to conducting the event. This will allow us to collect specific information on the number of people involved, the type of event or program, limit locations for the activity (if needed), and include any other stipulations that may be warranted to protect refuge resources.

Impacts on Other Wildlife

Adverse effects to wildlife have been shown to be directly proportional to increases in the number of users (Beale and Monaghan 2004). According to the study, groups of visitors using trails were more likely to cause behavioral changes in the animals studied when compared to individual visitors.

Disturbance can cause shifts in habitat use, abandonment of habitat, and increased energy demands on affected wildlife (Knight and Cole 1991). There is evidence to suggest that species most likely to be adversely affected are those where available habitat is limited, constraining them to stay in disturbed areas and suffer the costs of reduced survival or reproductive success (Gill et al. 2001).

Lenth et al. (2006) found, in areas that prohibited dogs, mule deer were less active up to 50 meters from recreational trails. In areas that allowed dogs, mule deer showed reduced activity within at least 100 meters of trails. While the refuge does not have mule deer, this may hold true for white-tailed deer as well. The same study found similar adverse effects for small mammals including squirrels, rabbits, chipmunks, and mice. This means that there is a certain area around recreational trails that becomes unsuitable habitat for certain wildlife species, even though the habitat will otherwise be suitable (Lenth et al. 2006).

Wildlife disturbance may be compounded by seasonal needs. For example, causing mammals to flee during winter months could consume stored fat reserves that are necessary to get through the winter. Hammitt and Cole (1998) found white-tailed deer females with young are more likely to flee from disturbance than those without young.

While little information is available on human disturbance and reptiles and amphibians, it is possible that visitors participating in wildlife observation, photography, environmental education, and interpretation may have adverse effects on these species. Because of their small size and tendency to hide under vegetation, visitors may not be aware of these species until they flee. Visitors may inadvertently injure or kill individuals when walking on or off-trail. Most of these species on the refuge are wetland species, which are areas typically avoided by visitors (except by boat) because of problems accessing these areas. Because these species are dormant in winter months, visitors are not likely to disturb them during this season.

Overall adverse impacts to mammals, reptiles, and amphibians are expected to minimal. Refuge use is currently low and increases in use will be monitored by Service staff to ensure impacts to

wildlife are minimal. Most of the use is spread out over the 11,484-acre Sunkhaze Meadows Unit, the largest refuge unit. This minimizes potential adverse impacts to wildlife. Most visitors participating in these activities are alone, or in small groups (less than 10 people). Organized environmental education or interpretation activities (e.g., nature walks, canoe trips) are more likely to involve larger groups. Because larger groups are more likely to disturb habitats and wildlife, we will require program leaders to obtain a SUP prior to conducting the event. This will allow us to collect specific information on the number of people involved, the type of event or program, limit locations for the activity (if needed), and include any other stipulations that may be warranted to protect refuge resources.

Summary of Impacts:
Specifically at Sunkhaze Meadows NWR, no impacts are expected on any threatened or endangered species, whether federally listed or State-listed. Trail use may discourage animal use of habitat very close to the trails, but the area impacted by trails is small compared to the area available to wildlife away from any trail. Overall, effects should not be significant since the units of the refuge all experience a low level of public use and we anticipate only moderate increases over the next 15 years.

Based on observations and knowledge of the areas involved, there is no evidence that cumulatively, the proposed wildlife-dependent uses will have unacceptable adverse effects on refuge resources. Although a substantial increase in the cumulative impacts from public use is not expected in the near term, it will be important for refuge staff to monitor use and respond, if necessary, to conserve the existing high quality wildlife resources.

No additional effects from wildlife observation, wildlife photography, environmental education, and interpretation area anticipated. Therefore allowing these uses poses only minimal threats to goal 1 of the CCP, “Promote the biological integrity, diversity, and environmental health of the Sunkhaze Meadows Unit’s wetland, forest, and aquatic habitats to protect water quality and sustain native plant communities, rare plants, and wildlife, including species of conservation concern.” In addition, these uses help fulfill goal 4 of the CCP.

PUBLIC REVIEW AND COMMENT:
As part of the comprehensive conservation plan (CCP) process for Sunkhaze Meadows NWR and Carlton Pond Waterfowl Production Area, this compatibility determination was available for public review and comment for 39 days concurrent with the release of our draft CCP and environmental assessment.

DETERMINATION (check one below):
This use is compatible __X__

This use is not compatible _____

STIPULATIONS NECESSARY TO ENSURE COMPATIBILITY:
On refuge lands:

- Refuge staff will continue to monitor the refuge for the presence of threatened or endangered species and ensure that unusual or critical conditions relative to habitat or disturbance are not present. If conditions dictate, uses of all or any part of the area may be temporarily suspended by posting.

- Periodic law enforcement will ensure compliance with regulations and area closures and discourage prohibited activities and vandalism.

- Outside individuals, groups, or organizations wishing to visit the refuge to provide environmental education or interpretation activities will be required to obtain a SUP. This will allow the refuge staff to provide important information about access, resources, and specific stipulations to reduce disturbances that may be caused by groups compared to individuals. It will also help the refuge quantify and monitor these uses on the refuge.

JUSTIFICATION:
Wildlife observation, wildlife photography, environmental education, and interpretation are priority public uses for the National Wildlife Refuge System through which the public can develop an appreciation for fish and wildlife resources (Executive Order 12996, March 25, 1996, and the National Wildlife Refuge System Administration Act of 1966, as amended by the National Wildlife Refuge System Improvement Act of 1997). The Service's policy is to provide opportunities for these uses when compatible and consistent with sound fish and wildlife management.

Allowing wildlife observation and photography, environmental education and interpretation on Sunkhaze Meadows NWR will not materially interfere with or detract from the mission of the National Wildlife Refuge System of the purposes for which the refuge was established. As listed in the purposes section of this compatibility determination, the refuge was established and subsequently land was acquired for two main purposes. These uses will not materially interfere with or detract from the wildlife and habitat protection aspects of the purposes because at the scales and level of current visitor use, wildlife and habitats are not appreciably negatively affected by these uses. We have made this determination based on lack of observed habitat degradation and because disturbance to wildlife will be short term, use is focused around established trails, and the trails that are used for these activities are designed to protect sensitive resources. Wildlife observation, photography, environmental education, and interpretation will not materially interfere with or detract from the endangered species aspect of the refuge's purposes, because there are no federally listed threatened or endangered species that occur on the refuge. Therefore, no significant adverse effects from wildlife observation, photography, and environmental education or interpretation are anticipated. Allowing these uses supports CCP goals and objectives as described in the refuge's CCP (USFWS 2013) and the refuge's purpose associated with allowing wildlife-oriented recreational opportunities. These activities will not materially interfere with or detract from the mission of the Service, because providing these wildlife-dependent recreational opportunities is a focus of the National Wildlife Refuge System.

SIGNATURE:

Refuge Manager: Beth Goettel (Signature) 8/19/2013 (Date)

CONCURRENCE:

Regional Chief: Scott B. Kahn (Signature) 9/17/2013 (Date)

MANDATORY 15 YEAR RE-EVALUATION DATE: 9/17/2028

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COMPATIBILITY DETERMINATION

USE: Fishing

REFUGE NAME: Sunkhaze Meadows National Wildlife Refuge

DATE ESTABLISHED: November 22, 1988

ESTABLISHING AUTHORITIES:

1. Fish and Wildlife Act of 1956 (16 U.S.C. 742a-742j; 70 Stat. 1119)

2. Refuge Recreation Act of 1962 (16 U.S.C. 460k-460k-4; 76 Stat. 653)

PURPOSE(S) FOR WHICH ESTABLISHED:

1. "... for the development, advancement, management, conservation, and protection of fish and wildlife resources ..." (16 U.S.C. 742f(a)(4)) "... for the benefit of the United States Fish and Wildlife Service, in performing it activities and services. Such acceptance may be subject to the terms of any restrictive or affirmative covenant, or condition of servitude ..." (16 U.S.C. 742f(b)(1) (Fish and Wildlife Act of 1956))

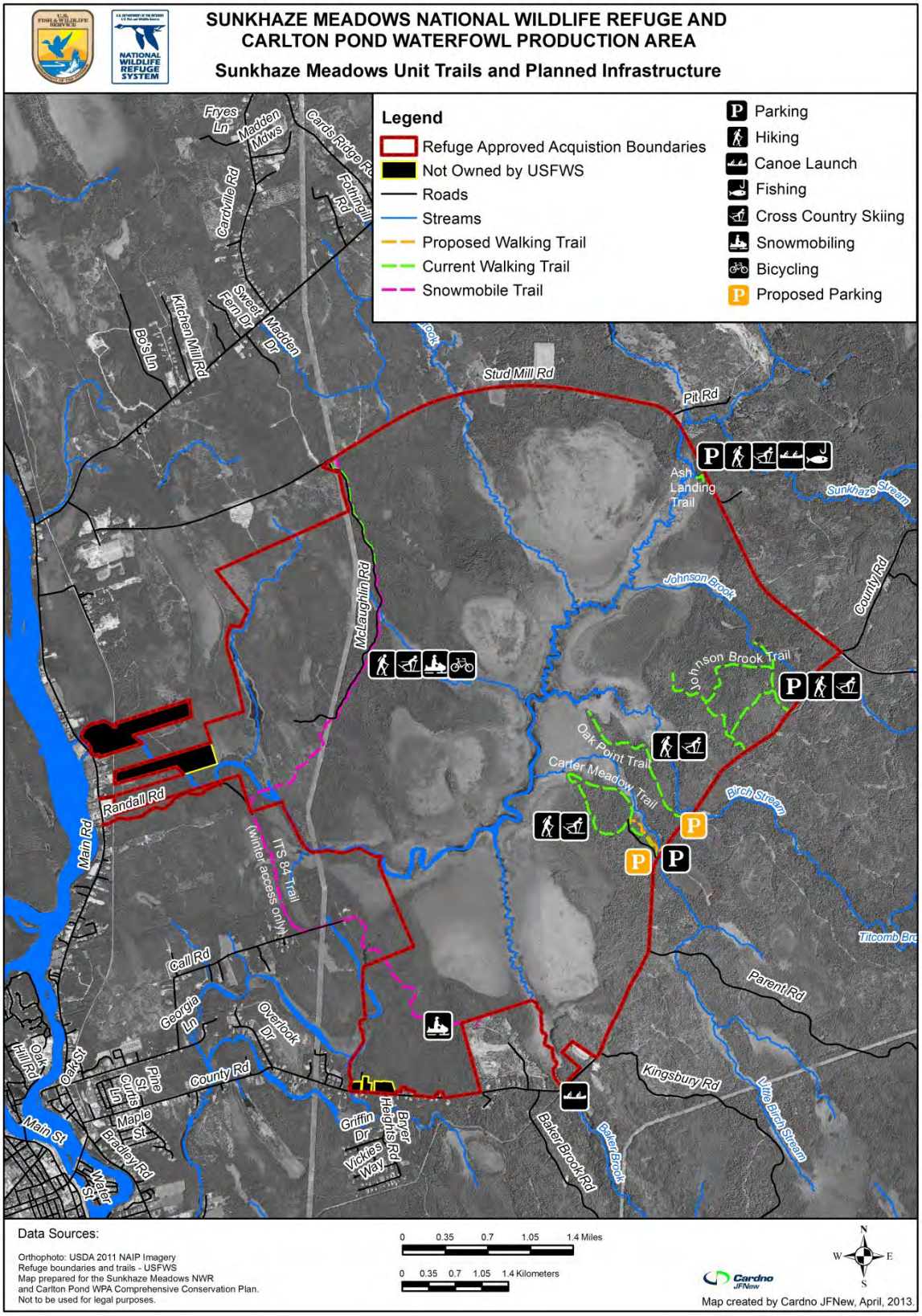
2. "... suitable for -- (1) incidental fish and wildlife-oriented recreational development, (2) the protection of natural resources, (3) the conservation of endangered species or threatened species ..." (16 U.S.C. 460k-1 (Refuge Recreation Act))

MISSION OF THE NATIONAL WILDLIFE REFUGE SYSTEM:
"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." (16 U.S.C. 668dd-668ee) (National Wildlife Refuge System Administration Act of 1966)

DESCRIPTION OF USE:
(a) What is the use? Is the use a priority public use?
The use is public fishing, a priority public use of the National Wildlife Refuge System under the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd-668ee), as amended by the National Wildlife Refuge System Improvement Act of 1997 (Public Law 105-57).

(b) Where will the use be conducted?
The use will be conducted on and from the banks of all refuge bodies of water that are open to fishing including Baker Brook, Birch Stream, Buzzy Brook, Dudley Brook, Johnson Brook, Little Birch Stream, Little Buzzy Brook, Sandy Steam, and Sunkhaze Stream. Since many of these banks are relatively inaccessible, we expect that fishing from banks will be concentrated where these streams intersect County Road or Stud Mill Road. Fishing may also be conducted by fishermen in waders walking in the waterways, and from boats in those brooks and streams that are navigable.

Map B.4. Streams open to fishing at the Sunkhaze Meadows Unit of Sunkhaze Meadows NWR.



(c) When will the use be conducted?
The use will be conducted during the seasons specified in the fishing regulations of the State of Maine and will occur between the hours of sunrise and sunset.

(d) How will the use be conducted?
The use will be conducted under Maine State fishing regulations for open water and ice-fishing, with some additional restrictions, discussed below, to protect fish, wildlife, and habitat, and to reduce potential public use conflicts. A valid State of Maine fishing license will be required to fish on the refuge. This compatibility determination applies to both shoreline fishing and fishing from motorized and non-motorized boats. Visitors participating in approved public uses are allowed off trail; however, off-trail use is limited to pedestrian access only (e.g., walking, snowshoeing, skiing).

Public boat launches are available at Ash Landing located off the Stud Mill Road and off Route 2 in Milford along the Penobscot River. Prior to launching the public should inspect motor boats and trailers and clean them of aquatic invasive species before launching. Maine Statute Title 38: 419B-420 prohibits the transport of any aquatic plant or parts of any aquatic plant, including roots, rhizomes, stems, leaves or seeds, on the outside of a vehicle, boat, personal watercraft, boat trailer or other equipment on a public road. Cleaning of boats should take place on dry ground well away from the water. Exotic, nuisance plants or animals on boats, trailers, diving equipment, or in bait buckets can disrupt aquatic ecosystems and negatively impact native fish and plant species. Sunkhaze Meadows and its associated tributaries appear to be relatively free of aquatic invasive plants, and cleaning of boats, trailers, and other equipment will help keep them that way. Signs, education, and periodic courtesy checks will help prevent the spread of invasive aquatic plants. Unauthorized introductions of both nonnative and native fish can also significantly disrupt aquatic ecosystems and destroy natural fisheries. No fish of any species may be introduced into refuge waters without appropriate State and refuge permits. This includes unused bait fish and eggs. Bait fish may be trapped by State regulation from refuge waters for personal use, but not for commercial purposes.

At the discretion of the refuge manager, some areas may be seasonally, temporarily, or permanently closed to fishing, if wildlife or habitat impacts or user conflicts become an issue. In cooperation with State fisheries biologists, we may manipulate the fisheries or habitat to promote or improve the fishery resource, if warranted. That may include changing fishing regulations (season dates, creel limits, and methods of take), introducing or removing fish barriers, manipulating instream or streambank habitat, and designating riparian buffers. Lead fishing sinkers or jigs will not be permitted on the refuge due to the potential for the lead to poison loons, waterfowl, and other waterbirds.

(e) Why is the use being proposed?
We have proposed this use because fishing is a wildlife-dependent public use that is supposed to receive enhanced consideration as specified in the Refuge Improvement Act and it is an historic use of the refuge. We have the opportunity to provide public fishing opportunities in a manner and location that will offer high-quality, wildlife-dependent recreation and maintain the level of current fish and wildlife values.

AVAILABLITY OF RESOURCES:
Facilities or materials needed to support fishing include annual review of the refuge fishing plan, signing and monitoring of fishing access points, and law enforcement patrols. The refuge also plans to upgrade the hand carry boat launch and access trail at Ash Landing which is a funded project in the 2012 budget and will be a 1-year cost.

Upgrade parking area and trail to Ash Landing boat launch:	$7,000
Annual review of fishing plan:	$450
Signing and monitoring fishing access sites:	$300
Law enforcement patrol:	$3,600
Program Cost:	**$11,350**

ANTICIPATED IMPACTS OF THE USE:
Some wildlife disturbance is created by fishing activity. Disturbance during the summer is limited to waterfowl, shorebirds, aquatic species, and marsh and wading birds.

The Sunkhaze Meadows Unit provides habitat for both warm water and coldwater fish species, although it is primarily warm water fish habitat (table B.1). Smithwood and McKeon (1999) compiled a list of 17 fish species as part of a fisheries management plan. Included in this list is Atlantic salmon, which has been reported entering the lower reaches of Sunkhaze Stream from the Penobscot River during warmer summer months. The Penobscot River is a major migratory pathway for Atlantic salmon. Brook trout and American eel are native to the Sunkhaze Stream system, while smallmouth bass were introduced sometime prior to the 1940s. Smithwood and McKeon (1999) found no data that blueback herring or alewife ever inhabited the refuge waters.

The primary brook trout habitat on the refuge appears to be a reach of Sunkhaze Stream from Stud Mill Road extending 200 meters downstream. During warm periods of the year they appear to move farther upstream. Brook trout are also found in Little Birch Stream. Nearly 40,000 brook trout were released into Sunkhaze Stream between 1940 and 1950, and another 500 were stocked in Sunkhaze and Birch Streams from 1974 to 1975, the last year that any fish were stocked on lands now encompassed by the refuge. The stocking period coincided with heavy fishing pressure, especially on brook trout (Smithwood and McKeon 1999).

A study of fish assemblages in the Penobscot River and some tributaries by Kiraly et al. (2011) included sampling of Sunkhaze Stream. The researchers used electro shocking from boats to measure the dominant fish species. For Sunkhaze Stream the dominant fish were golden shiner, brown bullhead, and pumpkinseed. Other species that were captured during the study included redbreast sunfish, yellow perch, chain pickerel, and common shiner.

Table B.1. Fish species captured on Sunkhaze Meadows Unit during summer 1997 (from Smithwood and McKeon 1999).

Species	Sunkhaze Stream			Birch Stream	Little Birch Stream
	Section 1	Section 2	Section 3		
American eel				X	
Blacknose dace				X	

Species	Sunkhaze Stream			Birch Stream	Little Birch Stream
	Section 1	Section 2	Section 3		
Brook trout					X
Brown bullhead		X			
Burbot				X	X
Chain pickerel	X	X	X		
Creek chub				X	X
Fallfish	X	X	X	X	
Golden shiner		X	X		
Pumpkinseed		X	X		
Redbreasted sunfish		X			
Smallmouth bass	X	X			
White sucker	X	X	X	X	
Yellow perch	X	X	X		

Potential impacts of public fishing on the refuge follow.

Impacts on Fish Species:
Recreational fishing by the public can have negative impacts on fish populations if it occurs at high levels or is not managed properly. Potential impacts from fishing include direct mortality from harvest and catch and release; injury to fish caught and released, changes in age and size class distribution, changes in reproductive capacity and success, loss of genetic diversity, altered behavior, and changes in ecosystems and food webs (Lewin et al. 2006, Cline et al. 2007).

These impacts are often disproportionate among fish species, sizes, ages, sexes, and based on other behavioral traits because anglers selectively catch fish based on these factors (Lewin et al. 2006). In general, anglers tend to target larger and older fish. The selective removal of larger and older fish can have a variety of impacts of fish population dynamics. First, it can decrease the age and size class distribution in fish populations. Second, larger and older fish tend to have greater reproductive capacity because they are better able to compete for spawning areas and generally have higher egg outputs. Because of this, their selective removal may reduce the populations overall reproductive success. Depending upon the species, anglers may also be more likely to catch males (e.g., some male largemouth bass are more aggressive towards lures) or females (e.g., in some species females grow faster). Also, fish that are more active during the day are often more vulnerable to being caught (Lewin et al. 2006).

Catch-and-release fishing can also have impacts on individual fish, including immediate or delayed mortality. The likelihood of mortality is related to the type of fishing gear used, where the fish is hooked, how the fish is handled, angler experience, and environmental conditions. In general, circle hooks tend to cause less damage than barbed hooks. Also, fish hooked in the lips or jaws tend to have minimal mortality as compared to fish hooked in the gills, esophagus,

intestine, or eyes. Fish caught and released with nonlethal injuries may also be exposed to parasites, or bacterial or fungal infections. Individuals that are caught and then handled may also experience stress, which can lead to changes in physiology and behavior which can in turn impact their growth, reproduction, and immune system (Lewin et al. 2006).

Since fishing generally removes individuals from a population, at high levels it can lead to reduced population sizes and loss of genetic diversity. The loss of genetic diversity can ultimately reduce a population's fitness, resilience, and ability to adapt to environmental changes and stressors, such as climate change. The higher the fishing mortality, the greater these types of impacts will be (Lewin et al. 2006).

While fishing does remove individuals from the population, we do not anticipate that current or projected fishing pressure will affect the refuge's fish populations as a whole. The State sets catch limits, designated waters, and fishing seasons to protect the State's fish populations. Sunkhaze Stream and its tributaries are dominated by warm water species (Kiraly 2012). Fish species usually sought are smallmouth and largemouth bass. While popular with anglers, smallmouth and largemouth bass are not native to Maine (MDIFW 2001). According to Maine Department of Inland Fisheries and Wildlife (MDIFW), there has been an increase of 47 percent in the number of lakes with one or more species of bass between 1980 and 2000 (MDIFW 2001). Given the distribution of these species and the State's estimates of abundance, we do not expect fishing pressure at Sunkhaze Meadows NWR to have adverse effects on these species.
Illegal take can also impact fish populations. Our refuge officer in cooperation with Maine State game wardens will continue to periodically patrol the refuge to help reduce illegal take.

Impacts on Other Wildlife:
Since fishing occurs along and in wetland areas, it has the greatest impact of any proposed use on aquatic and semi-aquatic species in refuge fishing areas. In particular, fishing has the potential to disturb waterfowl and waterbird species. Fishing seasons in Maine coincide in part with spring-early summer nesting and brood-rearing periods for many species of aquatic-dependent birds. Anglers can also affect the number, behavior, and temporal distribution of some species of birds, including bald eagles, common ravens, and American crows (Knight et al. 1991). Human activity, including both walking along trails and boat use, has the potential to affect the distribution, abundance, and species richness of water birds by disturbing birds that are overwinter, resting, foraging, reproducing, and nesting.

Disturbance from recreational activities vary with the wildlife species involved and the activity's type, level, frequency, duration, and the time of year it occurs. The responses of wildlife to human activities include avoidance or departure from the site (Owen 1973, Burger 1981, Kaiser and Fritzell 1984, Korschen et al. 1985, Kahl 1991, Klein 1993, Whittaker and Knight 1998), the use of suboptimal habitat (Erwin 1980, Williams and Forbes 1980), altered behavior or habituation to human disturbance (Burger 1981, Korschen et al. 1985, Morton et al. 1989, Ward and Stehn 1989, Havera et al. 1992, Klein 1993, Whittaker and Knight 1998), attraction (Whittaker and Knight1998), and an increase in energy expenditure (Morton et al. 1989, Belanger and Bedard 1990). Anglers and other boaters may disturb nesting birds by approaching too closely to nests, causing nesting birds to flush. Flushing may expose eggs to predation or cooling, resulting in egg mortality. Based on observations by Service staff and reports from

volunteers, flushing of nesting birds is not problematic at this time. If this becomes a problem we will close refuge areas seasonally to fishing and boating around sensitive nest sites, in conjunction with the state of Maine if necessary. Most boating is non-motorized at this time which significantly reduces potential impacts.

Visitors to the refuge engaged in fishing will generally be walking along refuge trails and roads or using motorized or nonmotorized boats in refuge ponds and lakes. A study by Miller, Knight, and Miller (1998) indicates that species composition and nest predation was altered adjacent to trails in both forested and grassland habitats. It appears that species composition changes are due to the presence of humans and not the trail or roadway itself. On the other hand, nest predation does appear to be a function of the trail which allows access to mammalian nest predators. Several studies have examined the effects of recreationists on birds using shallow-water habitats adjacent to trails and roads through wildlife refuges and coastal habitats in the eastern United States (Burger 1981, Burger 1986, Klein 1993, Klein et al. 1995, Rodgers and Smith 1995, Rodgers and Smith 1997, Burger and Gochfeld 1998).Overall, the existing research clearly demonstrates that disturbances from recreation activities have at least temporary effects on the behavior and movement of birds within a habitat or localized area.

The use of boats, particularly motorized boats, for fishing can also have impacts on fish and other species. Potential impacts include direct impacts, such as mortality from waves and propeller action, and indirect impacts, including increased stress levels, increased water turbidity, loss of food sources, and the dislodging of eggs and larvae from their substrate. Motorized boats can also disturb wildlife by creating loud noises, which may interfere with hearing, and by releasing toxic inorganic and organic compounds into the water and air (Lewin et al. 2006).

Lost fishing tackle may harm waterfowl, eagles, and other birds externally by catching and tearing skin. Fishing line may also become wrapped around body parts and hinder movement (legs, wings), impair feeding (bill), or cause constriction with subsequent reduction of blood flow and tissue damage. An object above or below the water surface may snag entangled animals, from which they are unable to escape. Nineteen percent of loon mortalities in Minnesota were attributed to entanglement in fishing line (Ensor et al. 1992). Entanglement in fishing line has also caused mortality in bald eagles. Birds may also ingest sinkers, hooks, floats, lures, and fishing line. Ingested tackle may cause damage or penetration of the mouth or other parts of the digestive tract, resulting in impaired function or death. Lead tackle is particularly toxic to wildlife. An investigation into causes of mortality in loons in New England found 52 percent of loon carcasses submitted to Tufts University Wildlife Clinic had died of lead poisoning from ingestion of lead sinkers (Pokras and Chafel. 1992). Maine law prohibits the sale of lead sinkers that weigh less than 0.5 ounces (Maine Title 12, part 13, subpart 4, chapter 923, subchapter 5, 12663-A), and the Service prohibits the use of any lead fishing sinkers or jigs on the refuge. The refuge and the State will continue to provide education and outreach on the hazards of lead sinkers and discarded fishing tackle. Our refuge officer will help in that public outreach.

Water Quality Impacts:
Pollutants from motorboats, human waste, and litter have the potential to have negative impacts on water quality. Extensive water quality testing on Sunkhaze Stream and its tributaries has not been carried out. As such, the levels of pollutants from boat fuel and impacts on local aquatic

systems are unknown. Hydrocarbon contamination can be harmful to fish; however, because of the size of the stream and limited access most boating on the refuge is currently non-motorized so we believe there is little contamination coming from this source. We will initiate public outreach and education on littering, pollutants, and proper waste disposal if the use increases substantially above current use levels to help mitigate water quality impacts. Water quality testing will be carried out as funding levels permit.

Bank and trail erosion from human activity (boat landings, boat wakes, foot traffic) may increase aquatic sediment loads of streams and rivers, or alter riparian or streamside habitat/ vegetation in ways harmful to fish or other wildlife. Boat access will be restricted to designated areas only. The trail to the Ash Landing boat launch will be 'hardened' to further reduce any erosion potential. Wetlands guard much of the refuge shoreline, making it extremely difficult to access for shore-based fishing. We do not intend to construct any new trails or boardwalks to provide shore-based fishing access. Therefore, at current levels of use, we do not expect trail erosion to increase because of foot traffic related to fishing. The majority of boat use that occurs on the refuge is non-motorized through the use of canoes and kayaks. When motors are used they are either low horsepower or electric trolling motors, therefore we do not anticipate any significant bank erosion due to boat wakes.

Other Impacts:
Accidental or deliberate introductions of nonnative fish may negatively impact native fish, wildlife, or vegetation. The refuge will continue to work cooperatively with the State in providing educational outreach and signs on preventing introductions of nonnative fish and try to contain introductions if they occur.

Accidental introduction of invasive plants, pathogens, or exotic invertebrates, attached to fishing boats may also impact native vegetation, wildlife, and habitats. With the exception of a few isolated occurrences of purple loosestrife, refuge waters appear to be relatively free of invasive aquatic plants and mollusks. However, we have not carried out extensive surveys of aquatic invasives. We can mitigate the potential for introductions by having boaters clean their boats before launching and after retrieving. We will also post launch sites with educational materials and have law enforcement officers make spot checks of vessels for compliance and to educate boaters on proper methods for checking for aquatic hitchhikers.

The 2011 national survey of fishing, hunting, and wildlife-associated recreation reveals that 341,000 Maine residents and nonresidents 16 years old and older fished in Maine (USFWS 2011). Sunkhaze Meadows NWR was a destination for some of this wildlife-dependent recreation. Visitors fishing on the refuge benefit the local economy by purchasing gas, food, fishing equipment, and lodging.

PUBLIC REVIEW AND COMMENT:
As part of the comprehensive conservation plan (CCP) process for Sunkhaze Meadows NWR and Carlton Pond Waterfowl Production Area, this compatibility determination was available for public review and comment for 39 days concurrent with the release of our draft CCP and environmental assessment.

DETERMINATION (check one below):
This use is compatible __X__

This use is not compatible _____

STIPULATIONS NECESSARY TO ENSURE COMPATIBILITY:

- Fishing access areas where streams intersect roads have been designated and signed.
- All boats, trailers, motors, and fishing gear will be encouraged to be inspected by the owner for plant material and cleaned prior to launching and after retrieval.
- Compliance with regulations will be achieved through education, signage, and law enforcement which will result in minimizing negative impacts to refuge habitat and wildlife.
- No commercial fishing or collecting bait for commercial purposes is allowed.
- Maine law prohibits the sale of lead sinkers weighing less than 0.5 ounces (Maine Title 12, part 13, subpart 4, chapter 923, subchapter 5, 12663-A). Use of any lead fishing sinkers or jigs is prohibited on the refuge.
- The refuge will be open to fishing during regular refuge hours, sunrise to sunset.

JUSTIFICATION:
Fishing is a priority public use for the National Wildlife Refuge System through which the public can develop an appreciation for fish and wildlife resources (the National Wildlife Refuge System Administration Act of 1966, as amended by the National Wildlife Refuge System Improvement Act of 1997). The Service's policy is to provide opportunities for this use when compatible and consistent with sound fish and wildlife management. Fishing is also a popular, traditional recreation activity in Maine that is strongly supported by the Maine Department of Inland Fisheries and Wildlife.

Allowing fishing at Sunkhaze NWR will not materially interfere with or detract from the mission of the National Wildlife Refuge System of the purposes for which the refuge was established. As listed in the purposes section of this compatibility determination, the refuge was established and subsequently land was acquired for two main purposes. As discussed under the section on anticipated impacts above, fishing is a wildlife-dependent priority public use with minimal adverse impacts on refuge resources. Because of this, it is consistent with the wildlife and habitat aspects of the refuge's purposes, the Service policy on fishing, the National Wildlife Refuge System Improvement Act of 1997, and the broad management objectives of the National Wildlife Refuge System. Fishing will not materially interfere with or detract from the endangered species aspect of the refuge's purposes, because there are no federally listed threatened or endangered species known to occur on the refuge. Therefore, no significant adverse effects from fishing are anticipated. Allowing this use supports CCP goals and objectives as described in the refuge's CCP (USFWS 2013) and the refuge's purpose associated with allowing wildlife-oriented recreational opportunities. This activity will not materially interfere with or

Wildlife Refuge System. Fishing will not materially interfere with or detract from the endangered species aspect of the refuge's purposes, because there are no federally listed threatened or endangered species known to occur on the refuge. Therefore, no significant adverse effects from fishing are anticipated. Allowing this use supports CCP goals and objectives as described in the refuge's CCP (USFWS 2013) and the refuge's purpose associated with allowing wildlife-oriented recreational opportunities. This activity will not materially interfere with or detract from the mission of the Service, because providing this wildlife-dependent recreational opportunity is a focus of the National Wildlife Refuge System.

SIGNATURE:

Refuge Manager: Beth Goettel (Signature) 8/19/2013 (Date)

CONCURRENCE:

Regional Chief: Scott B. Kahn (Signature) 9/17/2013 (Date)

MANDATORY 15 YEAR RE-EVALUATION DATE: 9/17/2028

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COMPATIBILITY DETERMINATION

USE: Hunting

REFUGE NAME: Sunkhaze Meadows National Wildlife Refuge

DATE ESTABLISHED: November 22, 1988

ESTABLISHING AUTHORITIES:

1. Fish and Wildlife Act of 1956 (16 U.S.C. 742a-742j; 70 Stat. 1119)

2. Refuge Recreation Act of 1962 (16 U.S.C. 460k-460k-4; 76 Stat. 653)

PURPOSE(S) FOR WHICH ESTABLISHED:

1. "... for the development, advancement, management, conservation, and protection of fish and wildlife resources ..." (16 U.S.C. 742f(a)(4)) "... for the benefit of the United States Fish and Wildlife Service, in performing it activities and services. Such acceptance may be subject to the terms of any restrictive or affirmative covenant, or condition of servitude ..." (16 U.S.C. 742f(b)(1) (Fish and Wildlife Act of 1956))

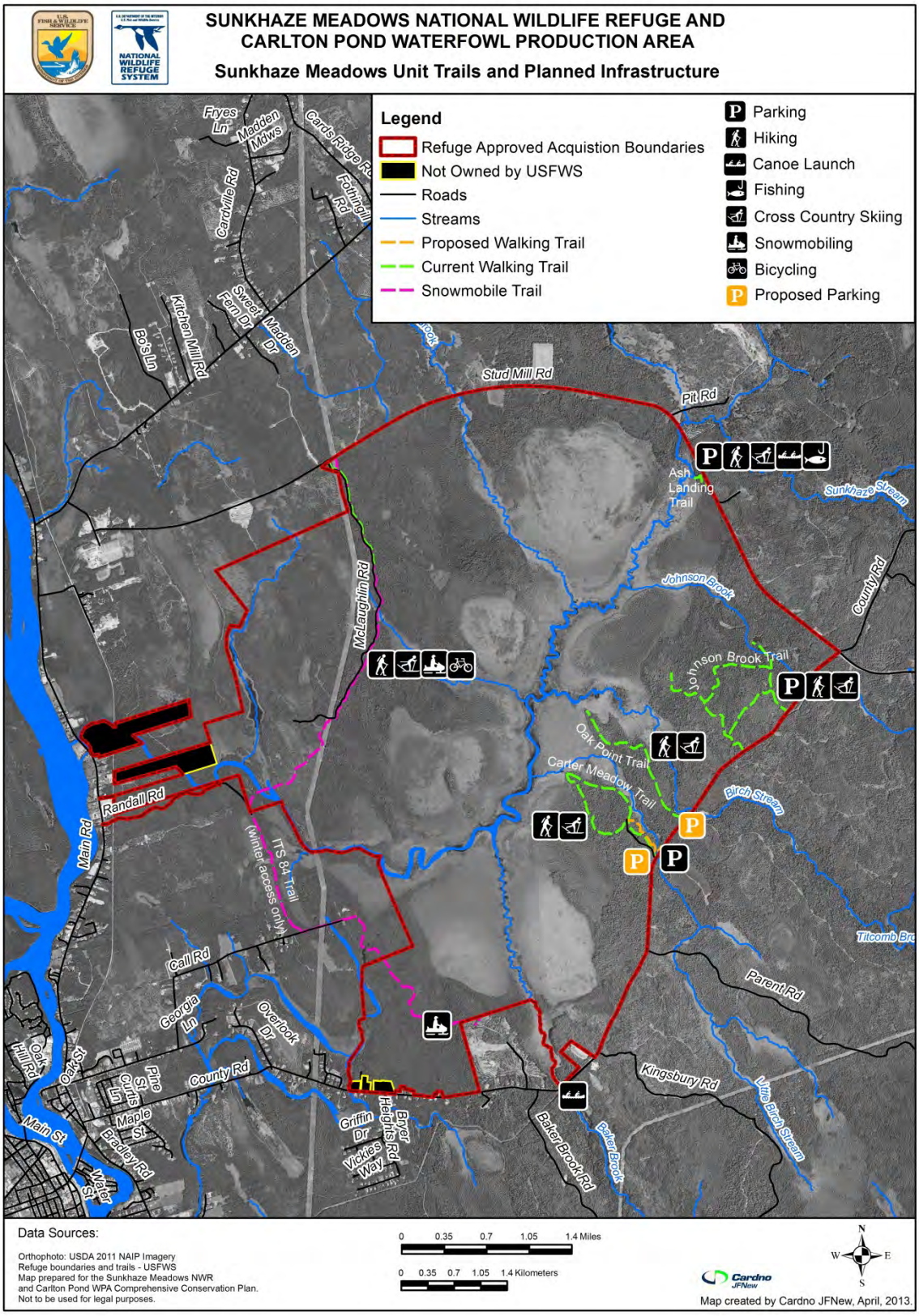
2."... suitable for -- (1) incidental fish and wildlife-oriented recreational development, (2) the protection of natural resources, (3) the conservation of endangered species or threatened species ..." (16 U.S.C. 460k-1 (Refuge Recreation Act))

MISSION OF THE NATIONAL WILDLIFE REFUGE SYSTEM:
"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." (16 U.S.C. 668dd-668ee) (National Wildlife Refuge System Administration Act of 1966)

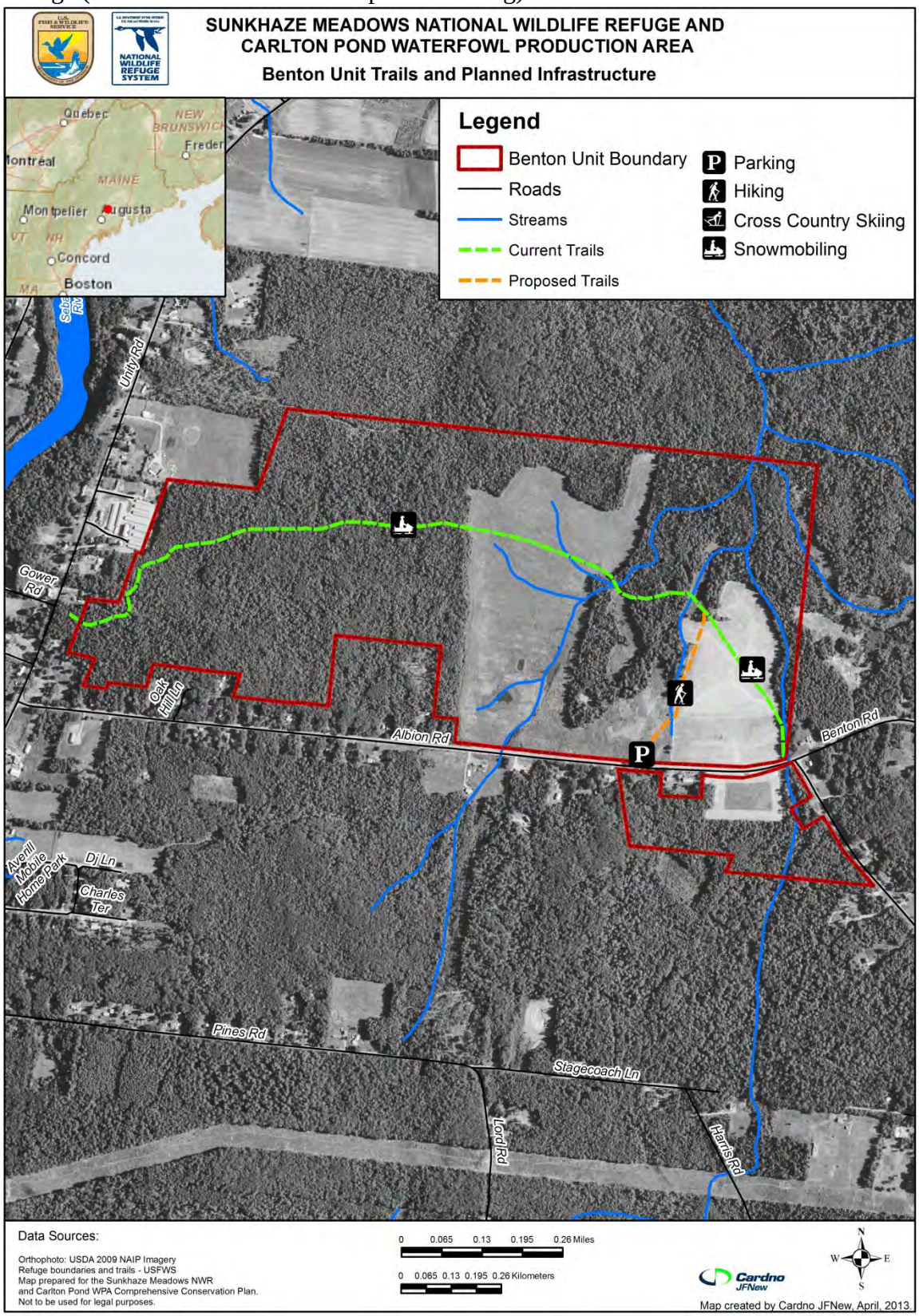
DESCRIPTION OF USE:
(a) What is the use? Is the use a priority public use?
The use is public hunting of migratory game birds (e.g., waterfowl), big game, and upland game. Hunting is a priority public use of the National Wildlife Refuge System under the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd-668ee), and the National Wildlife Refuge System Improvement Act of 1997 (Public Law 105-57).

(b) Where will the use be conducted?
Sunkhaze Meadows National Wildlife Refuge (NWR, refuge) has been open to public hunting of big game, upland game, and migratory game birds, for all Service-owned lands within the refuge boundary, since 1990 (USFWS 1990b). All Service-owned land within the three refuge units is open to hunting as specified in this CD and the annual hunt plan (see maps B.5 through B.7).

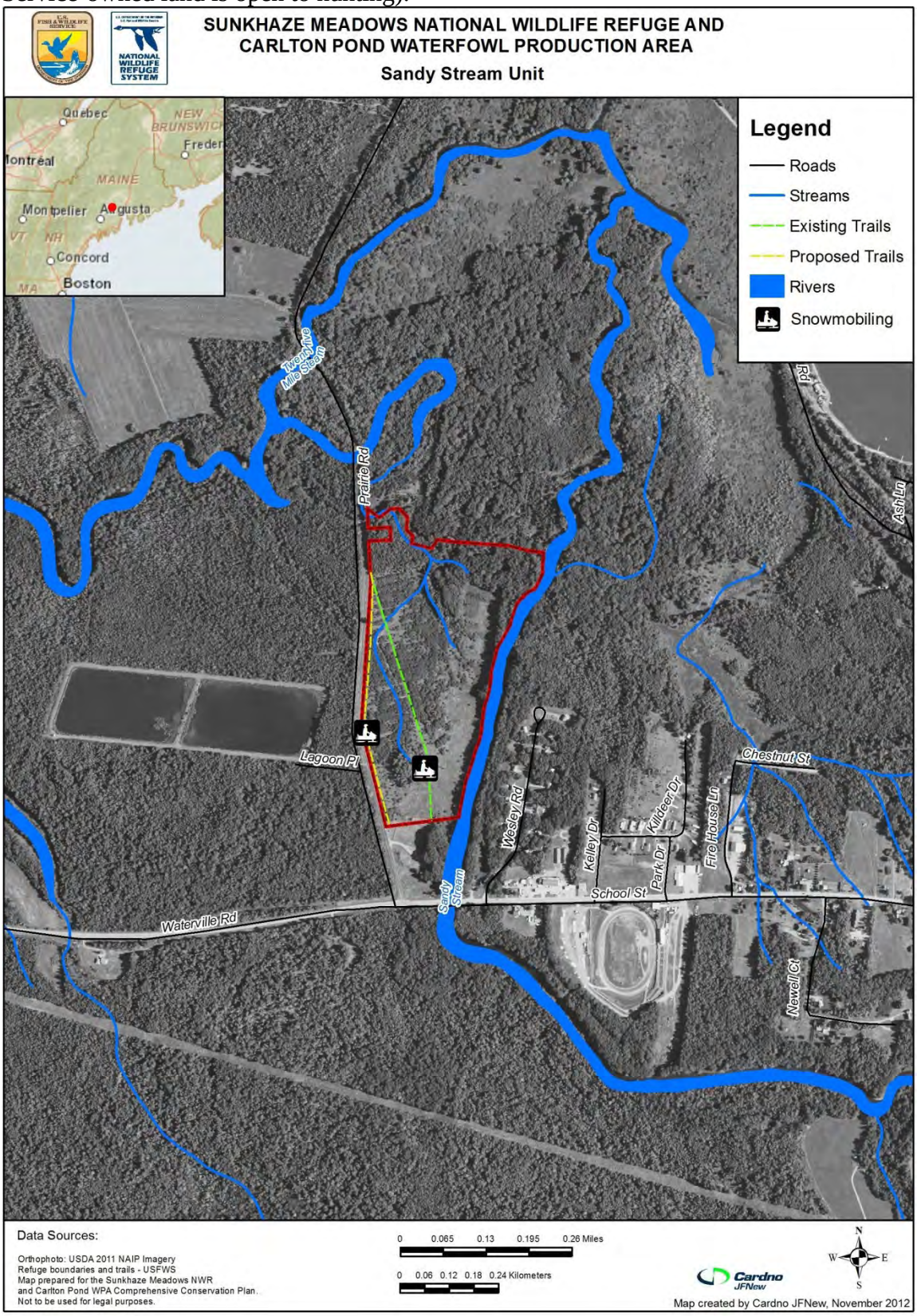
Map B.5. Areas open to hunting within the Sunkhaze Meadows Unit of Sunkhaze Meadows NWR (all Service-owned land is open to hunting).



Map B.6 Areas open to hunting within the Benton Unit of Sunkhaze Meadows National Wildlife Refuge (all Service-owned land is open to hunting).



Map B.7. Areas open to hunting within the Sandy Stream Unit of Sunkhaze Meadows NWR (all Service-owned land is open to hunting).



c) When will the use be conducted?
Hunting will be conducted during State of Maine seasons for big game, upland game, and waterfowl hunting seasons and will be in accordance with Federal and State regulations. In cooperation with the State, hunt season dates and bag limits may be adjusted in the future as needed to achieve balanced wildlife population levels and to limit conflicts with other user groups.

(d) How will the use be conducted?
The refuge permits hunting in accordance with State and Federal guidelines. Federal regulations contained in 50 CFR pertaining to the National Wildlife Refuge System Administration Act, as well as refuge-specific regulations, and stipulations in this compatibility determination will apply.

Hunters access the refuge on foot from the roadways, parking lots or trails, or via boats. In winter they may access the refuge via snowshoes or skis.

All areas of the refuge will continue to be open to the public for hunting season. Visitors participating in approved public uses are allowed off trail; however, off-trail use is limited to pedestrian access only (e.g., walking, snowshoeing, skiing). Signage at parking areas mentions that hunting is allowed and reminds visitors to wear blaze orange during appropriate time periods. Should visitor conflicts increase significantly, the refuge may consider zoning for different uses or area closures.

(e) Why is the use being proposed?
Hunting is one of the priority uses outlined by Congress in the Refuge Improvement Act of 1997. The Service supports and encourages priority uses on national wildlife refuge lands where appropriate and compatible. Hunting is used in some instances to manage wildlife populations. Hunting is also a traditional form of wildlife-oriented recreation that can be accommodated on many National Wildlife Refuge System lands.

AVAILABLITY OF RESOURCES:
Additional fiscal resources to conduct this activity will be minimal as the refuge has been open to hunting since 1990 and since hunting will occur under State regulations and not as a refuge regulated hunting program. Costs associated with administration of this use include:

Preparation of Annual Hunt Plan:	$500	GS-11 Wildlife Biologist GS-12 Deputy Refuge Manager
Preparation and updating of refuge hunting brochure:	$300	GS-12 Deputy Refuge Manager GS-9 Refuge Officer
Dispensing information during year:	$200	GS-6 Administrative Assistant
Law enforcement/outreach:	$3,000	GS-9 Refuge Officer
Estimated Total:	**$4,000**	

Based on a review of the budget allocated for hunting management, funding is adequate to ensure compatibility, and administer and manage the recreational use listed. Sufficient resources are available to continue the existing hunting program. Our existing staff and budget provide sufficient resources to continue current management.

ANTICIPATED IMPACTS OF THE USE:

Wildlife Impacts – Migratory Game Bird Species:

While individual birds are harvested as part of the refuge's hunt program, because of the Service's and the State's efforts to monitor and regulate harvest of these species, we do not expect adverse impacts at the population level from harvesting these species. Additional information on harvests and efforts to manage these species follows.

Waterfowl

Adverse effects on waterfowl populations are not expected because of the hunting regulations and bag limits that have been set in place by the Federal and State agencies (USFWS Migratory Bird Office and the Maine Department of Inland Fisheries and Wildlife (MDIFW)) that manage the harvest of waterfowl populations. Significant conservation measures and extensive pre- and post-season population monitoring and the institution of Adaptive Harvest Management are safeguards inherent in waterfowl management. Adverse effects on other game species are not expected, because hunting will occur under State and Federal regulations. The MDIFW and the Service set harvest limits that take into account game species population data collected by State biologists and wildlife species assessments.

Woodcock

Restrictive hunting regulations have been in effect for American woodcock since 1985 when surveys indicated a decline in numbers since the 1960s. The Service and State agencies monitor the population closely through a Migratory Bird Harvest Information Program (HIP) and also spring singing male counts (SGS) throughout the birds range, and use this information to set bag limits that are intended to protect woodcock population levels.

Based on data from the HIP, 7,100 woodcock hunters harvested 31,700 woodcock in Maine last year. The long-term trend (1968 to 2011) indicates a decline in woodcock numbers across their range; however, 2011 was the eighth year in a row that the population appears stable. In 2011, the number of males heard on SGS routes (3.58) was slightly higher than 2010 (3.41) and was above the 10-year average of 3.42 (MDIFW 2011a). Based on these data, we do not expect adverse effects at the population level.

Wildlife Impacts - Resident Game Species:

The MDIFW is responsible for the management of resident wildlife including game mammal species. They use a variety of methods to assess population levels and develop harvest strategies. While individual mammals are harvested as part of the refuge's hunt program, because of the State's efforts to monitor and regulate harvest of resident mammal species, we do not expect adverse impacts at the population level from harvesting these species. Additional information on harvests and State efforts to manage resident game species follows.

White-tailed Deer

During 2011, 198,107 deer hunting licenses were sold in Maine with hunter densities averaging about seven per square mile. Statewide, these hunters spent an estimated 1.08 million hunter days pursuing deer during Maine's 79-day deer hunting season. Deer hunting success was estimated at 11 percent in 2011 with 18,784 deer harvested. Wildlife Management District (WMD) 18, which includes the Sunkhaze Meadows Unit, had 258 deer harvested. WMD 23, which includes the Benton and Sandy Stream Units, had 1,657 deer harvested.

Deer populations vary considerably from region to region in the State largely due to severity of winter conditions with highest densities found in southern Maine and lowest numbers found to the north. MDIFW allocates a specific number of permits and take methods across 29 individual Wildlife Management Districts based on previous harvest data, and deer abundance aerial surveys to ensure healthy populations of deer within the State.

Moose

The annual allocation of moose permits is a function of specific management goals for each WMD. Permits were awarded to applicants by a computerized lottery with 49,889 applying for 3,903 permits. In 2011, 2,582 moose were checked into hunt stations. Of those, 38 moose were harvested in the WMD which includes the Sunkhaze Meadows Unit and 2 moose were harvested in the WMD which includes the Benton and Sandy Stream Units. Statewide, the success rate for last year's hunt was 79 percent which is equal to the average success rate for the last 9 years.

Aerial surveys are conducted in nine WMDs to count the number of bulls, cows, and calves. Based on these surveys, MDIFW estimated the 2011 Statewide moose population to be 76,000. These surveys, combined with data collected on female moose reproduction, survival rates obtained by aging teeth, and hunter sight-rate data, allows MDIFW to ensure that the harvest is in keeping with a healthy moose population.

Black Bear

The forests of Maine support the largest black bear population in the Eastern United States. For more than 35 years, MDIFW has closely monitored bears to ensure their management decisions are based on current and sound information. Harvest levels are determined based on harvest data and samples of teeth collected which help to show population trends and the number of bears present in the population.

The State regulates harvest by setting season length, bag limit, and legal methods of hunting. Most bears are harvested by hunting over bait (75 percent), 12 percent using dogs, 6 percent by deer hunters, 4 percent by still hunting[1], and 3 percent in traps. The total harvest in 2011 was 2,400 with 137 taken in the WMD that includes the Sunkhaze Meadows Unit. Eight bears were harvested in WMD 23 which includes Benton and Sandy Stream Units. No baiting is allowed on the refuge, and the refuge hunt season will be shorter than the State season (which starts August 26, 2013), which reduces harvest compared to surrounding areas.

[1] Rather than being completely 'still,' still hunters move slowly, deliberately, and quietly through the habitat looking for tracks, movement, fur, or other signs of the animal.

Furbearers and Small Mammals

In Maine, many mammals are harvested for their pelt value. Many of the species are harvested by trapping, but the following are also hunted: coyote, bobcat, raccoon, skunk, snowshoe hare, gray squirrel, woodchuck, porcupine, and red squirrel.

Currently the State's coyote population is between 10,000 to 12,000 in the winter and increases to 19,000 in spring. This number decreases due to the low number of pups that survive after birth. The coyote population will likely remain relatively constant unless wolves reestablish themselves in the State and then it is believed the coyote population will drastically decline (Jakubas 1999). The coyote population in Maine has been the center of controversy in recent years because of its potential role in affecting deer populations. There is a desire by some public to control or eliminate coyote populations. However, hunting and trapping has been shown to have little effect in determining Statewide population levels. There will need to be mortality rates greater than 70 percent for there to be a reduction in the population (Jakubas 1999). In 2011, 1,623 coyotes were taken in Maine through hunting and trapping.

The red fox population is distributed Statewide (Caron 1986) and is currently considered to be abundant and stable (Jakubas 2004). Red fox are hunted but most of the take for this species is through trapping. Harvests across the State in 2011 through trapping and hunting totaled 922.

The bobcat is a trapped and hunted species that is distributed over most of the State (Morris 1986). The Bobcat Management System is used to manage bobcat populations in the State (McLaughlin 1995). The number of bobcat harvested in 2011 through trapping and hunting was 305.

Population trends for the stripped skunk, porcupine, and woodchuck are unknown according to the State of Maine since harvests are not recorded.

Human Disturbance Effects

Hunting can have direct and indirect impacts on both target and non-target species. These impacts include direct mortality of individuals; changes in wildlife behavior; changes in wildlife population structure, dynamics, and distribution patterns; and disturbance from noise and hunters walking on- and off-trail (Cole and Knight 1990, Cole 1995, Bell and Austin 1985). In many cases, hunting removes a portion of the wildlife population that will otherwise naturally succumb to predation, disease, or competition (Bartmann et al. 1992). Typical changes in deer behavior in response to hunting include avoidance of certain areas, becoming more wary, staying closer to cover, and shifting feeding times (e.g., feeding more at night) (King and Workman 1986). For waterfowl species, hunting may also make them more skittish and prone to disturbance, reduce the amount of time they spend foraging and resting, alter their habitat usage patterns, and disrupt their pair and family bonds (Raveling 1979, Owen 1977, White-Robinson 1982, Madsen 1985, Bartelt 1987).

In general, visitors to the refuge engaged in hunting will be walking off-trail in designated areas open to hunting. General disturbance from recreational activities, including hunting, vary with the wildlife species involved and the activity's type, level, frequency, duration, and the time of year it occurs. The responses of wildlife to human activities, such as hunting, include avoidance

or departure from the site (Owen 1973, Burger 1981, Kaiser and Fritzell 1984, Korschen et al. 1985, Kahl 1991, Klein 1993, Whittaker and Knight 1998), the use of suboptimal habitat (Erwin 1980, Williams and Forbes 1980), altered behavior or habituation to human disturbance (Burger 1981, Korschen et al. 1985, Morton et al. 1989, Ward and Stehn 1989, Havera et al. 1992, Klein 1993, Whittaker and Knight 1998), attraction (Whittaker and Knight1998), and an increase in energy expenditure (Morton et al. 1989, Belanger and Bedard 1990). The amount of disturbance tends to increase with decreased distance between visitors and birds (Burger 1986).

Some bird species flee from human disturbance, which can lower their nesting productivity and cause disease and death (Knight and Cole 1991). Miller et al. (1998) found bird abundance and nesting activities (including nest success) increased as distance from a recreational trail increased in both grassland and forested habitats. Bird communities in this study were apparently affected by the presence of recreational trails, where common species (i.e., American robins) were found near trails and more specialized species (i.e., grasshopper sparrows) were found farther from trails. Nest predation also was found to be greater near trails (Miller et al. 1998). Disturbance may affect the reproductive fitness of males by hampering territory defense, male attraction and other reproductive functions of song (Arcese 1987). Disturbance, which leads to reduced singing activity, makes males rely more heavily on physical deterrents in defending territories, which are time and energy consuming (Ewald and Carpenter 1978).

Seasonal sensitivities can compound the effect of disturbance on wildlife. Examples include regularly flushing birds during nesting or causing mammals to flee during winter months, thereby consuming large amounts of stored fat reserves. Hammitt and Cole (1998) note that females with young (such as white-tailed deer) are more likely to flee from a disturbance than those without young.

The hunt at the refuge has been conducted since 1990 with no significant disturbance noted due to this use. Although the refuge has been unstaffed since 2008, weekly law enforcement patrols have been occurring since 2010. Since no permit system is in place, exact numbers of hunters using the refuge are not known. A number of hunters participate in the hunt, but they are dispersed over such a large area that disturbance in any one place has not been significant. With the exception of bald eagles, hunting takes place outside of the nesting period for migratory birds, further minimizing the potential effects on these species. Disturbance to bald eagles associated with this activity is expected to be minimal because 1) the overlap between hunting seasons and bald eagle nesting is limited (about 1 to 2 months), and 2) this is an existing use of the refuge and adverse impacts to this species have not been observed to date.

Impacts on Vegetation:
The physical effects on vegetation from hunting various game species on the refuge are expected to be minimal. All-terrain vehicles will not be allowed on the refuge. Other vehicles are restricted to designated roadways. Hunter use is generally dispersed over large areas. Hunters will have little to no impact on the vegetation.

Positive, indirect effects on the vegetation will result from a reduction in the white-tailed deer population. The impacts of dense deer populations on forest regeneration and the composition and diversity of the herbaceous understory have been well documented (Tierson et al. 1966,

Behrend et al. 1970, Tilghman 1989). Well-managed hunting can effectively control deer and produce dramatic changes in the forest vegetation (Behrend et al. 1970). The impact of deer hunting on the vegetation will be positive and result in better regeneration of forest canopy species and an increase in the diversity of the herbaceous understory. In summary, there will be few if any negative impacts from this use on the refuge's vegetation, but there will be beneficial impacts from the decrease of deer browse on the refuge's vegetation due to the decrease in the number of deer on refuge lands.

Possible negative cumulative impacts of the proposed activity include temporary trampling of vegetation and light soil erosion. Most hunting occurs during the fall and winter when the ground is either frozen, covered in snow, or when plants are dormant. For these reasons, cumulative impacts to plant communities and soils are not likely to be significant.

Impacts on Soils:
It is anticipated that minor impacts to soils will occur as a result of allowing hunting access on the refuge. Erosion potential will likely vary during the season based on soil moisture and temperatures. During much of the hunting season, soils may be frozen or covered in snow, thereby reducing the impacts greatly. At the current use level, impacts to soils (erosion, compaction) are not likely to be significant.

Impacts on Air and Water Quality:
Air quality and water quality impacts will be minimal and only due to refuge visitors' automobile emissions and run-off on roads and trails. These effects will not only come from hunters but from a majority of users of wildlife-dependent recreation on the refuge. Given the traditional low number of hunters, the effects on overall air and water quality in the region will be negligible, compared to the effects from non-refuge sources.

Economic Impacts:
The 2011 national survey of fishing, hunting, and wildlife-associated recreation reveals that 1,117,000 Maine residents and nonresidents 16 years old and older fished, hunted, or watched wildlife in Maine. Of that total, 341,000 fished, 181,000 hunted, and 838,000 participated in wildlife watching activities, including observing, feeding, and photographing wildlife (USFWS 2011). While we do not have exact numbers of hunters on the refuge units, visitors participating in this use provided some economic benefit to the local economies by purchasing goods and services (e.g., food, lodging, gas) in and around the three refuge units.

PUBLIC REVIEW AND COMMENT:
As part of the comprehensive conservation plan (CCP) process for Sunkhaze Meadows NWR and Carlton Pond Waterfowl Production Area, this compatibility determination was available for public review and comment for 39 days concurrent with the release of our draft CCP and environmental assessment.

DETERMINATION (check one below):
This use is compatible __X__

This use is not compatible _____

STIPULATIONS NECESSARY TO ENSURE COMPATIBILITY:
The hunt program will be managed in accordance with Federal and State regulations. The program will be reviewed annually to ensure that wildlife and habitat management goals are achieved and that the program is providing a safe, high quality hunting experience for participants. Stipulations are based on the refuge's Final Amended Environmental Assessment: Public Hunting (USFWS 1990a) and Hunting Management Plan (USFWS 1990b).

Refuge-specific regulations will further minimize negative impacts of the hunt on refuge habitat and wildlife. Compliance with regulations will be achieved through education, signage, and law enforcement. Refuge-specific regulations for 2012 are listed below (see also 50 CFR 32.38):

- *Migratory Game Bird Hunting*. We allow hunting of migratory game birds on all areas of the refuge in accordance with State regulations.

- *Upland Game Hunting*. We allow hunting of upland game on all areas of the refuge in accordance with State regulations subject to the following conditions:

    1. Shotgun hunters may possess only approved nontoxic shot while in the field (see 50 CFR 32.2(k)).

    2. We allow eastern coyote hunting from October 1 to March 31.

    3. We allow hunters to enter the refuge 1 hour before legal shooting hours (0.5 hours before legal sunrise in the State of Maine), and they must exit the refuge by 1 hour past legal shooting hours (0.5 hours after legal sunset in the State of Maine), except for hunters pursuing raccoons and coyotes at night.

    4. The hunter must retrieve all species, including coyotes, harvested on the refuge.

- *Big Game Hunting.* We allow hunting of black bear, bobcat, moose, and white-tailed deer on all areas of the refuge in accordance with State regulations subject to the following conditions:

    1. We require hunter-orange clothing in accordance with State of Maine regulations.

    2. We allow hunters to enter the refuge 1 hour before legal shooting hours (0.5 hours before legal sunrise in the State of Maine), and they must exit the refuge by 1 hour past legal shooting hours (0.5 hours after legal sunset in the State of Maine).

    3. We allow bear hunting from October 1 to the end of the State-prescribed season. We prohibit the use of bait during the hunting of bears.

    4. All tree stands must be removed by the last day of the white-tailed deer hunting season (see 50 CFR 27.93).

JUSTIFICATION:

Hunting is a priority public use of the National Wildlife Refuge System through which the public can develop an appreciation for fish and wildlife resources (The National Wildlife Refuge System Administration Act of 1966, as amended by the National Wildlife Refuge System Improvement Act of 1997). The Service's policy is to provide enhanced opportunities for this use when compatible and consistent with sound fish and wildlife management. In addition, hunting is an historic use of the refuge and is a popular, traditional recreation activity on public lands in Maine that is strongly supported by the Maine Department of Inland Fisheries and Wildlife.

Allowing hunting on Sunkhaze Meadows NWR will not materially interfere with, or detract from, the mission of the National Wildlife Refuge System of the purposes for which the refuge was established. As listed in the purposes section of this compatibility determination, the refuge was established and subsequently land was acquired for two main purposes. As discussed under the section on anticipated impacts above, hunting is a wildlife-dependent priority public use with minimal adverse impacts on refuge resources. Because of this, it is consistent with the wildlife and habitat aspects of the refuge's purposes, the Service policy on hunting, the National Wildlife Refuge System Improvement Act of 1997, and the broad management objectives of the National Wildlife Refuge System. Hunting will not materially interfere with or detract from the endangered species aspect of the refuge's purposes, because there are no federally listed threatened or endangered species that occur on the refuge. Therefore, no significant adverse effects from public hunting are anticipated. Allowing this use supports CCP goals and objectives as described in the refuge's CCP (USFWS 2013) and the refuge's purpose associated with allowing wildlife-oriented recreational opportunities. This activity will not materially interfere with or detract from the mission of the Service, because providing this wildlife-dependent recreational opportunity is a focus of the National Wildlife Refuge System.

SIGNATURE:

Refuge Manager: Beth Goettel (Signature) 8/19/2013 (Date)

CONCURRENCE:

Regional Chief: Scott B Kahn (Signature) 9/17/2013 (Date)

MANDATORY 15 YEAR RE-EVALUATION DATE: 9/17/2028

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COMPATIBILITY DETERMINATION

USE: Furbearer Management (Trapping)

REFUGE NAME: Sunkhaze Meadows National Wildlife Refuge

DATE ESTABLISHED: November 22, 1988

ESTABLISHING AUTHORITIES:

1. Fish and Wildlife Act of 1956 (16 U.S.C. 742a-742j; 70 Stat. 1119)

2. Refuge Recreation Act of 1962 (16 U.S.C. 460k-460k-4; 76 Stat. 653)

PURPOSE(S) FOR WHICH ESTABLISHED:

1. "... for the development, advancement, management, conservation, and protection of fish and wildlife resources ..." (16 U.S.C. 742f(a)(4)), "... for the benefit of the United States Fish and Wildlife Service, in performing it activities and services. Such acceptance may be subject to the terms of any restrictive or affirmative covenant, or condition of servitude ..." (16 U.S.C. 742f(b)(1) (Fish and Wildlife Act of 1956))

2. "... suitable for -- (1) incidental fish and wildlife-oriented recreational development, (2) the protection of natural resources, (3) the conservation of endangered species or threatened species ..." (16 U.S.C. 460k-1 (Refuge Recreation Act))

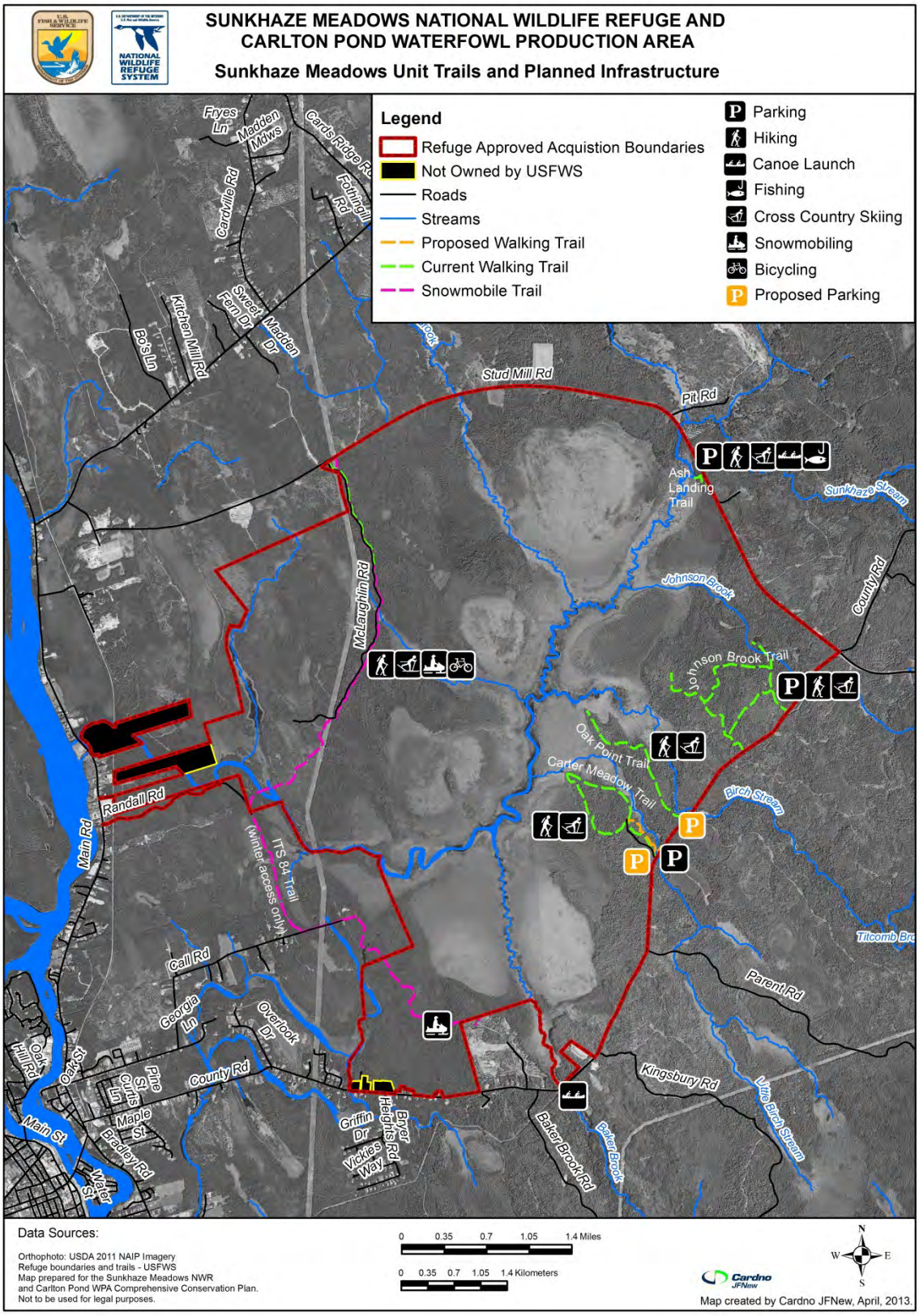
MISSION OF THE NATIONAL WILDLIFE REFUGE SYSTEM:
"To administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans." (16 U.S.C. 668dd-668ee) (National Wildlife Refuge System Administration Act of 1966)

DESCRIPTION OF USE:

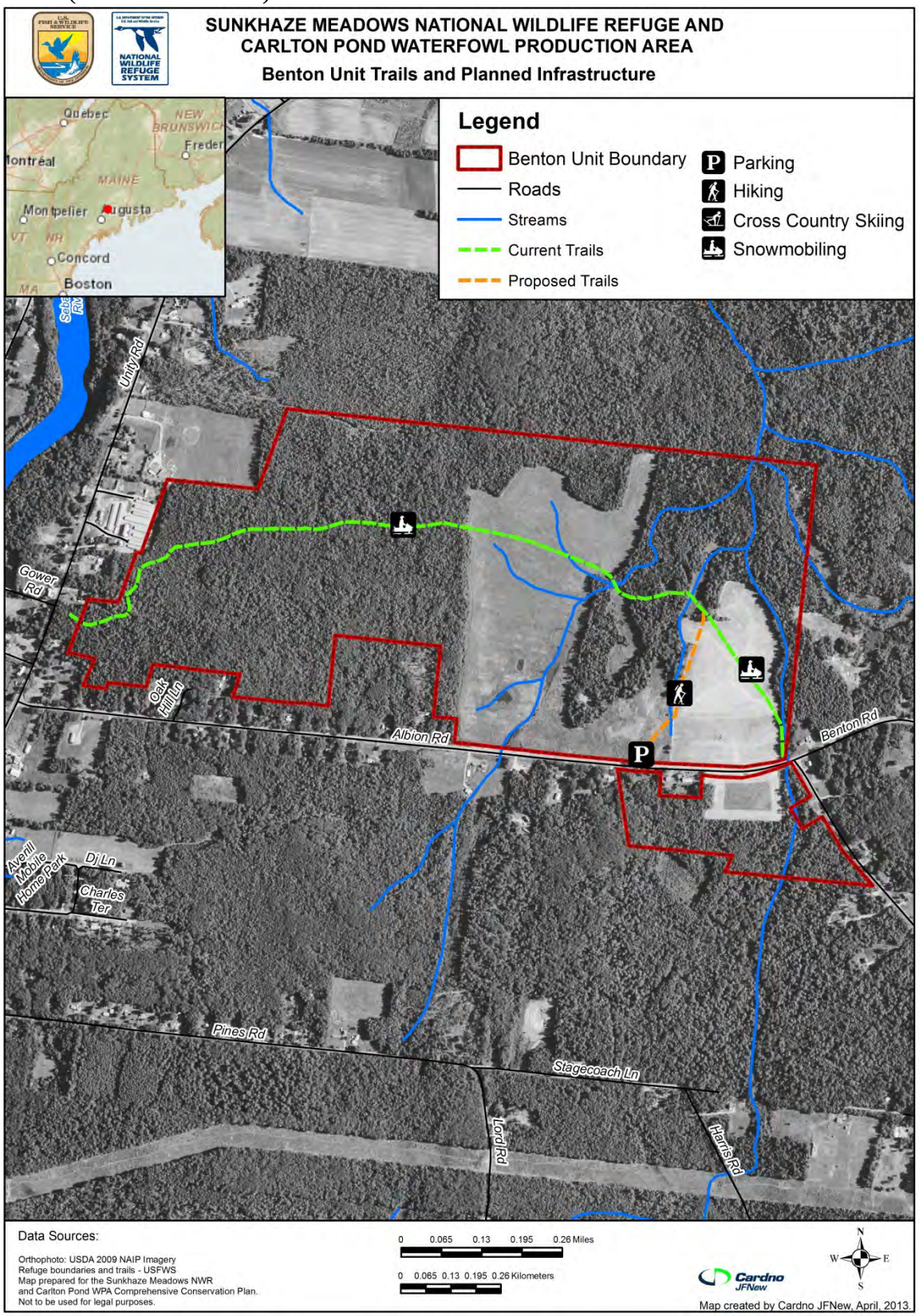
(a) What is the use? Is it a priority public use?
The use is furbearer management. We consider furbearer management to be a refuge management economic activity. It is not a priority public use of the National Wildlife Refuge System (Refuge System) under the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd-668ee), as amended by the National Wildlife Refuge System Improvement Act of 1997.

(b) Where will the use be conducted?
Furbearer management through trapping is an allowable practice in Maine and will be conducted in locations where it will accomplish refuge goals and objectives. Currently, trapping is allowed at the Sunkhaze Meadows Unit and the Benton Unit, but not at the Sandy Stream Unit (maps B.8 and B.9). Traps may be set anywhere within these two units, except that no traps are to be set where they can be easily seen from visitor vantage points, nor within 100 feet of roads or trails (see Stipulations section below).

Map B.8. Areas open to furbearer management within the Sunkhaze Meadows Unit of Sunkhaze Meadows NWR (see text for details).



Map B.9. Areas open to furbearer management within the Benton Unit of Sunkhaze Meadows NWR (see text for details).



Refuge law enforcement will ensure that trappers on the refuge comply with State and refuge regulations and that the data submitted to the refuge are accurate.

(c) When will the use be conducted?
Furbearer management will be conducted in accordance with the Maine State seasons. Maine furbearer management seasons usually run from mid-October to the end of December, with beaver trapping in Wildlife Management District 18, where the Sunkhaze Meadows Unit is located, allowed until mid-April.

(d) How will the use be conducted?
The refuge will be open to furbearer management for the following species: beaver, bobcat, mink, fisher, marten, coyote, fox, muskrat, opossum, otter, raccoon, red squirrel, skunk, and weasel. Although bear trapping is allowed in Maine, bears are not considered a furbearer. Bear trapping is not allowed on the refuge. Data collected over the 9 years from 2001 through 2010 shows that trappers at the Sunkhaze Meadows Unit are overwhelmingly targeting beaver and muskrat. Trapper reports show that total take has been an average of 15 beavers per year and 11 muskrats per year during that time period. Other than these rodents, which have a high reproductive capacity, only one bobcat, one coyote, three fisher, four mink, six otters, one raccoon, and two skunks have been taken in that time.

As specified in the Furbearer Management Plan, we will conduct furbearer management activities following Maine State regulations and impose any necessary refuge-specific restrictions through issuance of a special use permit (SUP). The refuge will allow furbearer management during State seasons under State limits for the targeted species. The refuge manager reserves the authority to regulate the numbers of target species taken in any one location as well as the number of trappers or number of traps per trapper allowed. If we determine that limits on the number of trappers is necessary, we will follow the procedures outlined in the Service's Refuge Manual (5 RM 17.11) and other applicable laws and regulations (see also 50 CFR 29.1). Trappers are allowed off-trail; however, off-trail use is limited to pedestrian access only (e.g., walking, snowshoeing, skiing).

Sunkhaze Meadows National Wildlife Refuge (NWR, refuge) has had fairly light demand for trapping. Analyzing the averages since 2001, trappers have requested an average of 8.4 permits per year, but only six trappers per year have actually trapped. Therefore, zones have not been established nor limits set. However, if necessary, such controls could be implemented to meet our goals for protecting refuge resources.

We will continue to manage the furbearer management program through the SUP process and, if needed, will work with the State to have special furbearer management regulations. Administering the program under an annual SUP will allow the refuge manager to have a ready list of contacts for requests for specific management needs to accomplish refuge objectives.

We will require a harvest report from each trapper following the close of the trapping season. The report will include data about the trapping effort (trap-days), the time span of trapping by species, the number of target and non-target species harvested, the refuge areas trapped, and remarks on observations of wildlife or other noteworthy ecological information. Those data will

provide a basis for catch-per-unit effort and population trend analyses. We will continue to use these data to monitor potential impacts of this use on refuge populations of furbearers, as well as the overall status of refuge furbearer populations. If the required information is lacking for a trapper from the previous year, we will not issue the SUP for the next year.

(e) Why is this use being proposed?
Because trapping is considered an economic use, per Federal law (see 16 U.S.C. 715(s)) and Service regulations (50 CFR 29.1), we may only allow economic uses of a refuge or WPA natural resource where the use contributes to achieving refuge or WPA purposes or the Refuge System mission. We will conduct furbearer management: (1) as a tool to manage habitat and maintain the predator-to-prey balance, (2) as a mechanism to collect survey and monitoring information that otherwise will be expensive and difficult to obtain using refuge resources, and (3) as a way to collect initial data that may lead to research on furbearer (and other wildlife) occurrence, activity, movement, population status, and ecology. By maintaining a trained, experienced group of trappers, the Service can use their skills and local knowledge to perform or assist in valuable management or research functions. Trappers could potentially provide assistance with the implementation of structured management objectives, such as the alleviation or reduction of wildlife damage conflicts, negative interactions among species, and habitat modifications.

A trapping program also fosters the appreciation of wildlife and nature, wildlife observation, environmental education, a greater understanding of ecological relationships, stewardship of natural resources, and inter-generational passage of the methodologies of renewable resource use. Trapping is an activity in which family members and friends often participate and share joint experiences that broaden appreciation of natural resources and ecological awareness (Daigle et al. 1998).

AVAILABLITY OF RESOURCES:
The financial resources necessary to provide and administer this use at its current level are now available, and we expect them to be available in the future. The refuge manager will provide overall administration of the program. A wildlife biologist will be required to evaluate furbearer activity, potential and current impacts on refuge resources, and potentially prescribe harvest objectives or quotas. The biologist will also evaluate trapper data and compile trapping reports. An administrative assistant will be required to help process SUPs. The refuge's law enforcement officer, in coordination with other law enforcement agencies, will check refuge trappers and ensure compliance with State and refuge regulations.

A breakdown of the projected annual cost of the trapping programs is shown below:

Administration:	$60
Law Enforcement and Monitoring:	$800
Biological Staff Time (Program Oversight):	$500
Estimated Total:	**$1,360**

ANTICIPATED IMPACTS OF THE USE:
The impacts of furbearer management on the purposes of the refuge and mission of the Refuge System can be either direct or indirect, and may have negative, neutral, or positive impacts on refuge resources. We have incorporated impacts of trappers using snowshoes or skis to access traps under "Anticipated Impacts of the Use" in the compatibility determination for snowshoeing and cross-country skiing.

Direct effects of trapping include the removal of individuals of both target (i.e., furbearer) and non-target species. Indirect impacts include reduced production among migratory birds resulting from disturbance during the pair bonding/nesting season, increased recruitment of birds as a result of removing predators of birds or their nests, or habitat change as a consequence of the removal of species that alter habitats (e.g., beavers or muskrats).

Impacts to Furbearers:
The impacts of the furbearer management program obviously include those on the furbearer populations themselves. Trapping harvests and removes individuals of the species. The anticipated direct impacts of trapping on wildlife will be a temporary reduction of furbearer populations in those areas where surplus furbearers exist. The removal of excess furbearers from those areas will maintain furbearer populations at levels compatible with the habitat and with refuge objectives, minimize furbearer damage to facilities and wildlife habitat, minimize competition with or interaction among wildlife populations and species that conflict with refuge objectives, and minimize threats of disease to wildlife and humans.

Maine Department of Inland Fisheries and Wildlife considers most furbearer populations around the Sunkhaze Meadows Unit to be stable (J. DePue, MDIFW 2013 personal communication). There is some concern about recent declines in fisher and bobcat harvests in this area; there is also concern about over harvest of river otters in this area (J. DePue, MDIFW 2013 personal communication). As noted above, trapper reports show that an average of 15 beavers and 11 muskrats have been taken per year between 2001 and 2010. Other than these species, which have a high reproductive capacity, only one bobcat, one coyote, three fisher, four mink, six otters, one raccoon, and two skunks have been taken between 2001 and 2010. Because most furbearer populations are considered to be stable in the area and because of the low harvest levels of other species (i.e., bobcat, fisher, and otter), we do not expect the refuge's trapping program to have adverse effects on furbearers at the population level.

A national program operated under the guidance of the Fur Resources Technical committee of the International Association of Fish and Wildlife Agencies (IAFWA 1998) systematically improves the welfare of animals in trapping through trap testing and the development of "Best Management Practices (BMPs) for Trapping Furbearers in the United States." The refuge will cooperate with and contribute to the development and implementation of those BMPs by practicing an integrated, comprehensive approach to furbearer management, wherever and whenever possible.

Impacts to Other Wildlife:
Non-target species could be taken incidentally through this trapping program. Traps will be set specifically around areas of targeted species activity to reduce the risk of taking species other

than targeted species. The experience of the trappers and the selection of the appropriate trap size will reduce non-target captures (Northeast Furbearer Resources Technical Committee 1996, Boggess et al. 1990). State regulations require that bait be covered, so birds of prey are not able to see the bait from above. Lynx (federally listed as endangered) have not been documented on the refuge. Therefore, potential impacts to lynx are negligible or nonexistent. If lynx are someday identified on the refuge, the refuge manager will work with the State of Maine to implement measures to prevent accidental take of lynx. The refuge manager will ensure that measures are utilized to avoid take of waterfowl and other non-target species.

Trappers may temporarily disturb wildlife while walking around the refuge. Disturbances will vary by wildlife species involved and the type, level, frequency, duration, and the time of year activities occur. Disturbance can cause shifts in habitat use, abandonment of habitat, and increased energy demands on affected wildlife (Knight and Cole 1991). Miller et al. (1998) found bird abundance and nesting activities (including nest success) increased as distance from a recreational trail increased in both grassland and forested habitats. In this study, common species (e.g., American robins) were found near trails and rare species (e.g., Blackburnian warblers) were found farther from trails. In some cases there is a clear link between the extent of disturbance and either the survival or reproductive success of individuals (e.g., Schulz and Stock 1993), but in many cases disturbance acts in a more subtle way, by reducing access to resources such as food supplies or nesting sites (Gill et al. 1996). Bird flight in response to disturbance can lower reproductive success by exposing individuals and nests to predators. For recreation activities that occur simultaneously (e.g., hiking, biking) there will likely be compounding negative impacts to wildlife (Knight and Cole 1991). However, because of the temporal separation of trapping activities and breeding wildlife using the refuge, disturbance of migratory birds by trappers will be negligible, and can be further reduced by regulating trapping activity in certain areas at times when such birds are likely to be present.

Conflicts with Other Public Uses:
A program of regulated furbearer management on the refuge as described under this compatibility determination is not expected to conflict with public use on the refuge. Conflicts with public uses are not expected because trapping is generally an inconspicuous activity, traps are usually hidden from view, and they are usually checked in the early morning when other visitation is low. Stipulations set forth in this CD also require that traps will continue to be set only where traps or trapped furbearers are not readily visible from public highways, overlooks, or other visitor facilities. No land sets may be set within 100 feet of any road or trail open to the public. These characteristics serve to limit the potential for encounters between traps or captured animals and those engaged in other public use activities.

In addition**,** Maine furbearer management seasons usually run from mid-October to the end of December, with beaver trapping in Wildlife Management District 18, where the Sunkhaze Meadows Unit is located, allowed until mid-April. Trappers usually rely on thick ice to get out to where they set their beaver and muskrat traps, and although other visitors snowshoe and ski in the winter, these visitors are not as likely to ski or snowshoe in this very coldest weather, nor are they as likely to go all the way out to the streams.

Other Beneficial Impacts:
Regulated trapping has been documented to provide a variety of ecological benefits including prevention and alleviation of habitat degradation, facilitation of habitat and wildlife restoration, reduction of predation on key species of management concern, protection of rare and endangered species, dampening of disease transmission and severity of disease outbreaks among wildlife and between wildlife and humans, and the conservation and enhancement of biological and genetic diversity (Boggess et al. 1990, Organ et al. 1996).

Implementation of a regulated trapping program on the refuge provides a mechanism to collect survey and monitoring information, and possibly contribute to research on furbearer (and other wildlife) occurrence, activity, movement, population status, and ecology. The ecological and monitoring benefits are management services that will be accomplished through minimal or even no cost to the government, compared to costs associated with using salaried staff or contractual arrangements with private individuals or organizations, other agencies, or refuge staff. By maintaining a trained and experienced cadre of trappers, the Service can utilize their skills and local knowledge to perform or assist with valuable management or research functions (Mason 1990). Trappers who participate in the refuge program will provide assistance with the implementation of structured management objectives, such as the alleviation or reduction of wildlife damage conflicts, negative interactions among species, and habitat modifications. Refuge trappers typically have a stake in proper habitat and wildlife conservation and protection of the ecological integrity of the refuge so they can continue trapping. Accordingly, they are valuable assets for the refuge manager in providing on-site reports concerning the fundamental status of habitat, wildlife, and refuge conditions.

Furbearers are considered a renewable natural resource with cultural and economic values (Andelt et al. 1999, Boggess et al. 1990, Northeast Furbearer Resources Technical Committee 1996, Payne 1980). Several human dimensions studies have documented trapper profiles, cultural aspects of trapping, and the socioeconomic role of trapping in the United States (Andelt et al. 1999, Boggess et al. 1990, Daigle et al. 1998, Gentile 1987). A regulated trapping program on the refuge also fosters the appreciation of wildlife and nature, wildlife observation, environmental education, a greater understanding of ecological relationships, stewardship of natural resources, and inter-generational passage of the methodologies of renewable resource use. Trapping is an activity in which family members and friends often participate together and share joint experiences that broaden the sense of appreciation for natural resources and ecological awareness, and indeed even a sense of community (Glass et al. 1991, Daigle et al. 1998).

PUBLIC REVIEW AND COMMENT:
As part of the comprehensive conservation plan (CCP) process for Sunkhaze Meadows NWR and Carlton Pond Waterfowl Production Area, this compatibility determination was available for public review and comment for 39 days concurrent with the release of our draft CCP and environmental assessment.

DETERMINATION (check one below):
This use is compatible __X__

This use is not compatible _____

STIPULATIONS NECESSARY TO ENSURE COMPATIBILITY:

- Permittees must comply with all conditions of the refuge furbearer management SUP and all State regulations relating to trapping .

- Traps shall be set only where traps or trapped furbearers are not readily visible from public highways, overlooks, or other visitor facilities. No land sets may be set within 100 feet of any road or trail open to the public.

- Permittees, when requested by refuge staff or Federal or State enforcement officers, must display for inspection their State trapping license, refuge trapping permit, trapping equipment, and all animals in their possession.

- Ingress to and egress from the refuge shall be only by routes that are currently open for travel. Motorized vehicles are restricted to McLaughlin Road when the gate is open during hunting season, and travel by snowmobile only allowed on ITS 84. Use of all-terrain vehicles is prohibited anywhere on the refuge. Permittees will use good judgement to avoid damage to refuge roads, lands, and waters, and will promptly report any such damage caused or observed. Permittees must not interfere with or cause hazards to vehicular or snowmobile travel, or the activities of other refuge visitors.

- Permittees shall, no later than 30 days after the last day of the refuge trapping season, submit to the refuge manager the trapping report form provided with the trapper permit, even if no trapping was conducted or no animals taken.

- Use of all-terrain vehicles is prohibited anywhere on the refuge. Trappers must not interfere with or cause hazards to vehicular travel, or the activities of other refuge visitors.

- The use of exposed bait and setting traps adjacent to naturally occuring carcasses are prohibited.

- Permittees will be issued the booklet “How to Avoid Incidental Take of Lynx.” Any lynx capture will be handled according to established refuge protocol for reporting, investigating, and releasing a lynx which is incidentally caught. That will include the immediate notification of and cooperation with the Service, Maine Department of Inland Fisheries and Wildlife, and the Maine Warden Service.

- Permittees must immediately release non-target species (other than lynx) that are uninjured and report those captures by species and number as part of the annual report. Injured or killed animals must be reported as specified by the Maine Department of

Inland Fisheries and Wildlife trapping regulations and also mentioned in the annual report to the refuge.

JUSTIFICATION:
We have determined that allowing trapping on the refuge will not materially interfere with, or detract from, the mission of the National Wildlife Refuge System or the purposes for which the refuge was established for the following reasons. First, furbearer populations, with local exceptions, are stable or increasing in Maine and the furbearer management program on the refuge does not have any known negative impacts on furbearer populations. Second, at current and projected levels of use, adverse impacts to wildlife and habitat are expected to be minimal because of the temporal separation of trapping activities (usually fall and winter) and breeding wildlife (usually in spring) using the refuge.

In fact, based on the analysis presented above, we have determined that it will contribute to the mission of the National Wildlife Refuge System and the purposes for which the refuge was established. Furbearer management through trapping on the refuge is a useful tool in maintaining balance between furbearers and habitat. High populations of predators can decrease the survival and nesting success of migratory birds, thus compromising the central purpose of the refuge. Trapping may provide survey and monitoring information that otherwise will be expensive and difficult to obtain using refuge resources; and potentially may contribute to research on furbearer (and other wildlife) occurrence, activity, movement, population status, and ecology. By maintaining a trained, experienced group of trappers, the Service can use their skills and local knowledge to perform or assist in valuable management or research functions. Trappers who participate could provide assistance with the implementation of structured management objectives, such as the alleviation or reduction of wildlife damage conflicts, negative interactions among species, and habitat modifications; maintenance of the vigor and health of furbearer populations; and safeguarding the refuge infrastructure critical to habitat management for focal fish and wildlife species. Trapping also helps build appreciation for natural resources, ecological awareness, and support for the Refuge System.

SIGNATURE:

Refuge Manager: Beth Goettel (Signature) 8/19/13 (Date)

CONCURRENCE:

Regional Chief: Scott B. Kahn (Signature) 9/17/2013 (Date)

MANDATORY 10 YEAR RE-EVALUATION DATE: 9/17/2023

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FWS Form 3-2319
02/06

Finding of Appropriateness of a Refuge Use

Refuge Name: Sunkhaze Meadows National Wildlife Refuge

Use: Ice skating

This exhibit is not required for wildlife-dependent recreational uses, forms of take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision criteria:	YES	NO
(a) Do we have jurisdiction over the use?	X	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	X	
(c) Is the use consistent with applicable Executive orders and Department and Service policies?	X	
(d) Is the use consistent with public safety?		X
(e) Is the use consistent with goals and objectives in an approved management plan or other document?	X	
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	X	
(g) Is the use manageable within available budget and staff?	X	
(h) Will this be manageable in the future within existing resources?	X	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	X	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D. for description), compatible, wildlife-dependent recreation into the future?	X	

Where we do not have jurisdiction over the use ("no" to (a)), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to (b), (c), or (d)) may not be found appropriate. If the answer is "no" to any of the other questions above, we will **generally** not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes X No ___

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate: X **Appropriate:** _____

Refuge Manager: Beth Goettel Date: 8/19/13

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use.

If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence.

If found to be **Appropriate**, the refuge supervisor must sign concurrence:

Refuge Supervisor: Graham W. Taylor Date: 9/11/2013

A compatibility determination is required before the use may be allowed.

Justification for a Finding of Appropriateness of a Refuge Use

Refuge Name: Sunkhaze Meadows National Wildlife Refuge

Use: Ice skating

Narrative:
Ice skating is a not a priority public use of the National Wildlife Refuge System (Refuge System), as defined under the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd-668ee), as amended by the National Wildlife Refuge System Improvement Act of 1997 (Public Law 105-57).

Occasionally, conditions are such that ice skating on Sunkhaze Stream is tempting. Refuge staff have received reports that some people have participated in this use on the refuge in the past. Ice skating is generally safe on ponds and lakes in Maine when the winter is cold and the ice is think enough. However, ice thicknesses over moving water are sometimes not uniform. Based on our evaluation, we have found ice skating not appropriate at Sunkhaze Meadows National Wildlife Refuge because it is not consistent with public safety. There is the potential for ice skaters to fall through areas of thin ice and become injured.

FWS Form 3-2319
02/06

Finding of Appropriateness of a Refuge Use

Refuge Name: Sunkhaze Meadows National Wildlife Refuge

Use: Recreational gathering of blueberries, blackberries, strawberries, raspberries, cranberries, mushrooms, fiddleheads, and antler sheds

This exhibit is not required for wildlife-dependent recreational uses, forms of take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision criteria:	YES	NO
(a) Do we have jurisdiction over the use?	X	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	X	
(c) Is the use consistent with applicable Executive orders and Department and Service policies?	X	
(d) Is the use consistent with public safety?	X	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?	X	
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	X	
(g) Is the use manageable within available budget and staff?	X	
(h) Will this be manageable in the future within existing resources?	X	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	X	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D. for description), compatible, wildlife-dependent recreation into the future?	X	

Where we do not have jurisdiction over the use ("no" to (a)), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to (b), (c), or (d)) may not be found appropriate. If the answer is "no" to any of the other questions above, we will **generally** not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes X No ___

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate: ____ **Appropriate:** X

Refuge Manager: Beth Goettel Date: 8/19/2013

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use.

If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence.

If found to be **Appropriate**, the refuge supervisor must sign concurrence:

Refuge Supervisor: [illegible] Date: 9/11/2013

A compatibility determination is required before the use may be allowed.

Justification for a Finding of Appropriateness of a Refuge Use

Refuge Name: Sunkhaze Meadows National Wildlife Refuge

Use: Recreational gathering of blueberries, blackberries, strawberries, raspberries, cranberries, mushrooms, fiddleheads, and antler sheds

Narrative:
Federal regulations (50 CFR 27.51(a) and 27.21) prohibit the destruction or collection of plants and the taking of plants or animals (except as allowed by regulated hunting) on national wildlife refuges. However, picking and gathering blueberries, raspberries, blackberries, cranberries, and mushrooms involves the removal of fruiting bodies only and does not harm the plants, which are left in place. Similarly, the removal of fiddleheads involves removing only some of the fronds as they sprout, similar to harvesting asparagus. Again, the plant itself is not destroyed or collected. Antler sheds are a discarded animal part; collecting these does not harm the deer or moose that have shed them.

The gathering of berries, mushrooms, fiddleheads, and antler sheds are historic uses of Sunkhaze Meadows National Wildlife Refuge (refuge) and have occurred continuously on refuge lands for decades. These uses are not priority public uses of the National Wildlife Refuge System, as defined by the Refuge System Improvement Act of 1997 (Public Law 105-57). However, the gathering of these materials can foster a connection to, and appreciation for, the area's natural resources, and they often occur concurrently with other public uses, including priority public uses. Current levels of these uses are low and we are not aware of any conflicts with other public uses or negative effects on refuge resources from these uses. This use only allows the collection of parts of plants and animals, such as berries and antler sheds, and not the collection of entire plants or wildlife.

We have determined that continuing to allow these uses is consistent with the environmental assessment prepared for the refuge's establishment (see page 35 in USFWS 1988), and with the U.S. Fish and Wildlife Service's policy on the appropriateness of refuge uses (603 FW 1).

Reference:
U.S. Fish and Wildlife Service (USFWS). 1988. Final environmental assessment: proposal to establish Sunkhaze Meadows National Wildlife Refuge, Penobscot County, Maine. U.S. Department of the Interior, U.S. Fish and Wildlife Service, Region 5. Newton Corner, Massachusetts.

COMPATIBILITY DETERMINATION

USE: Recreational Gathering of Blueberries, Blackberries, Strawberries, Raspberries, Cranberries, Mushrooms, Fiddleheads, and Antler Sheds

REFUGE NAME: Sunkhaze Meadows National Wildlife Refuge

DATE ESTABLISHED: November 22, 1988

ESTABLISHING AUTHORITIES:

1. Fish and Wildlife Act of 1956 (16 U.S.C. 742a-742j; 70 Stat. 1119)

2. Refuge Recreation Act of 1962 (16 U.S.C. 460k-460k-4; 76 Stat. 653)

PURPOSE(S) FOR WHICH ESTABLISHED:

1. "... for the development, advancement, management, conservation, and protection of fish and wildlife resources ..." (16 U.S.C. 742f(a)(4)) "... for the benefit of the United States Fish and Wildlife Service, in performing it activities and services. Such acceptance may be subject to the terms of any restrictive or affirmative covenant, or condition of servitude ..." (16 U.S.C. 742f(b)(1) (Fish and Wildlife Act of 1956))

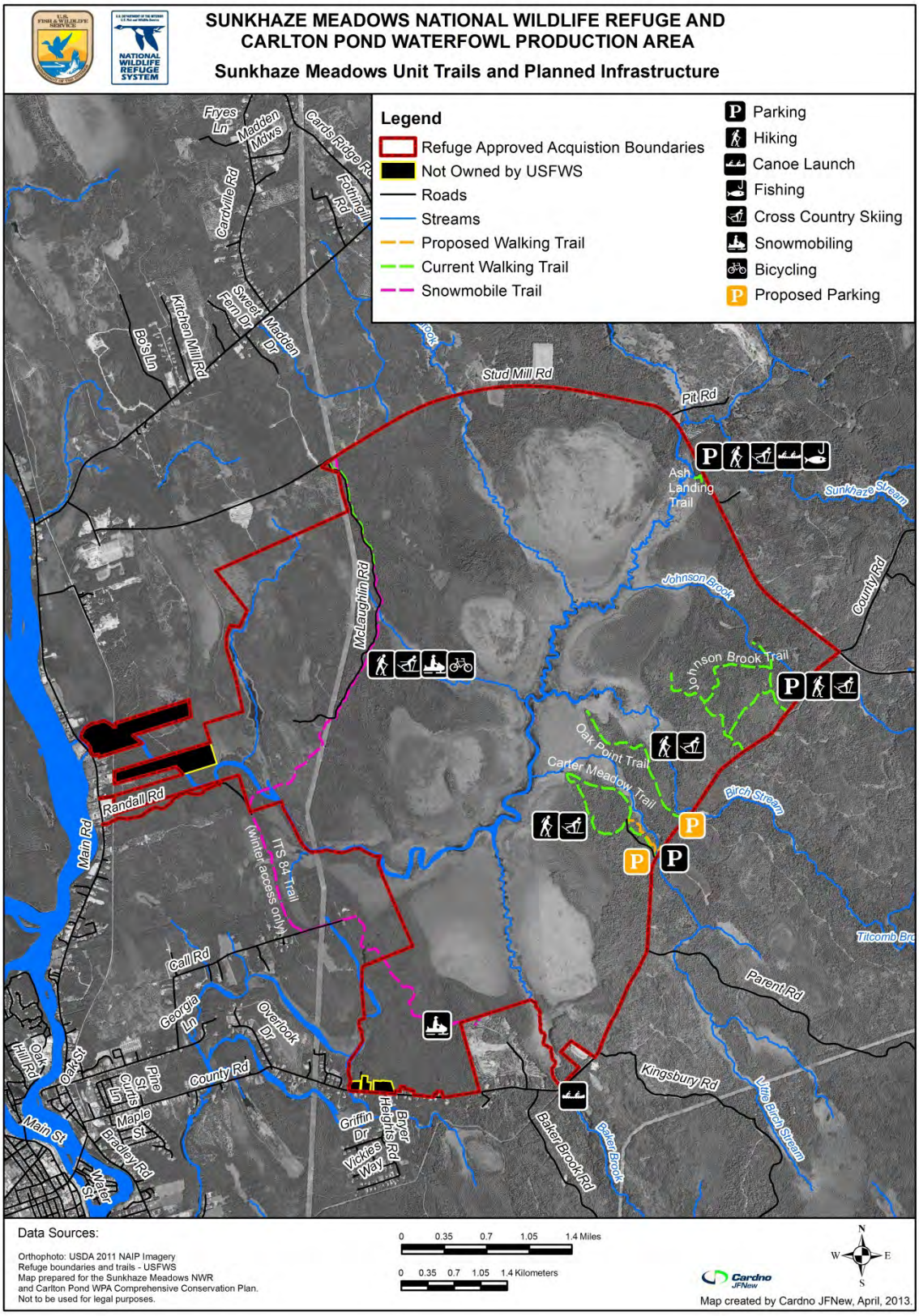
2. "... suitable for -- (1) incidental fish and wildlife-oriented recreational development, (2) the protection of natural resources, (3) the conservation of endangered species or threatened species ..." (16 U.S.C. 460k-1 (Refuge Recreation Act))

MISSION OF THE NATIONAL WILDLIFE REFUGE SYSTEM:
"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." (16 U.S.C. 668dd-668ee) (National Wildlife Refuge System Administration Act of 1966)

DESCRIPTION OF USE:
(a) What is the use? Is the use a priority public use?
The primary use is recreational gathering of blueberries, blackberries, strawberries, raspberries, cranberries, mushrooms, fiddleheads, and antler sheds. "Tipping," the collection of evergreen boughs for the making of wreaths, and the cutting of evergreens for Christmas trees is not included under this compatibility determination and is not allowed. This is not a priority public use of the National Wildlife Refuge System (Refuge System) under the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd-668ee), as amended by the National Wildlife Refuge System Improvement Act of 1997 (Public Law 105-57).

(b) Where will the use be conducted?
The use will be allowed on the Sunkhaze Meadows Unit of the refuge (map B.10).

Map B.10. Areas open to gathering within the Sunkhaze Meadows Unit of Sunkhaze Meadows NWR (see text for details).



(c) When will the use be conducted?
These uses are seasonal in nature, as they naturally occur. Antler sheds are typically found during the late winter to early spring. Fiddleheads are typically gathered in early spring. Blueberries, blackberries, strawberries, raspberries, and cranberries are typically gathered from July to September and mushrooms may be available at varying times during the growing season.

(d) How will the use be conducted?
Raspberries, strawberries, blackberries, and blueberries are found in refuge fields and woodlands. Cranberries are found in a few specific locations in the Sunkhaze Meadows bog. Visitors participating in this use park at refuge parking areas and walk along the Buzzy Brook, Oak Point or Johnson Brook Trails. Berry picking is often incidental to walking and hiking along these trails. The vast majority of berry picking occurs along the 8 miles of designated trails on the Sunkhaze Meadows Unit. These trails are located in the spruce-fir-deciduous upland that surrounds the Sunkhaze Meadows bog. Visitors participating in approved public uses are allowed off-trail; however, off-trail use is limited to pedestrian access only (e.g., walking, snowshoeing, skiing). Some visitors may come specifically to engage in berry picking or other allowed collecting; this is one more way to engage the public in getting outdoors and observing wildlife. Berry pickers are limited to collecting only enough for personal or family consumption. Nearly all berries that are collected are consumed in the field. All areas of the refuge are open to this activity, but physical access to areas beyond the trail system is difficult and this rarely occurs. Biting insects discourage even the hardiest visitors during the summer.

At the discretion of the refuge manager, some areas may be seasonally, temporarily, or permanently closed to gathering of natural materials if wildlife or habitat impacts, or if user conflicts become an issue. Furthermore, the refuge manager may modify daily and yearly limits of natural materials to be collected. No plants may be introduced or transplanted on refuge lands to promote recreational gathering of berries and no plants (other than mushrooms and fiddleheads) are to be removed from the refuge.

(e) Why is this use being proposed?
Gathering of these natural materials has occurred in the area for many years and this use was specifically requested by the public while we were developing the comprehensive conservation plan (CCP) for Sunkhaze Meadows NWR. Current use levels for this activity are very low and the use primarily occurs along roads and in disturbed areas like log landing and roadsides. This use is typically a family activity and provides an opportunity for families to connect with the natural environment. While people engage in this activity they often observe and gain an appreciation for wildlife and refuge habitats.

AVAILABLITY OF RESOURCES:
The resources necessary to provide and administer this use are available within current and anticipated refuge budgets. Staff time associated with the administration of this use is primarily related to answering general questions from the public and monitoring impacts of the use on refuge resources. This activity is administered by the refuge staff which assesses interactions among user groups and any related user impacts. Resource impacts will be monitored by refuge staff, under the supervision of the refuge manager. The use of refuge staff to monitor the impacts of public uses on refuge resources, and visitors is required for administering all refuge public

uses. Therefore, these responsibilities and related equipment are accounted for in budget and staffing plans.

Costs associated with gathering natural materials are estimated below:

Law enforcement–patrol/visitor-resource protection/ public use monitoring/enforcement/outreach:	$2,000 GS-9 Refuge Officer
Resource impacts/monitoring:	$1,000 GS-11 Wildlife Biologist
Estimated Total Cost:	**$3,000**

ANTICIPATED IMPACTS OF THE USE:
The gathering of natural materials will have impacts to refuge resources that are similar to those discussed in the compatibility determination for wildlife observation, photography, environmental education, and interpretation. In general, visitors engaged in these uses will be traveling by foot, either by walking or hiking, in designated areas and along designated trails and roads. Visitors will likely engage in gathering natural resources while participating in priority public uses on the refuge. Engaging in priority public uses provides visitors with a better appreciation for and more complete understanding of the wildlife and habitats associated with the refuge. This can translate into more widespread and stronger support for the refuge, the National Wildlife Refuge System, and the Service, as well as wildlife conservation in general.

The negative impacts of this use include impacts to plants, soils, hydrology, and wildlife from visitors walking and hiking on the refuge, we have described these impacts below; however, because most visitors gathering natural materials are also participating in other compatible public uses, we do not expect pedestrian impacts associated with this use to be additive.

Vegetation Impacts:
Pedestrian travel can have indirect impacts to plants by compacting soils and diminishing soil porosity, aeration, and nutrient availability that affect plant growth and survival (Kuss 1986). Hammitt and Cole (1998) note that compaction limits the ability of plants to re-vegetate affected areas. Repeated foot travel can directly impact plants by crushing the plants themselves. Rare plants with limited site occurrence are particularly susceptible to such impacts. Plants growing in wet or moist soils are the most sensitive to disturbance from trampling effects (Kuss 1986). Moist and wet soil conditions are present at the refuge, particularly during spring and early summer.

It is anticipated that allowing this use will cause vegetation loss on designated routes. Foot travel may increase root exposure and trampling effects; however, it is anticipated that under current levels of use the incidence of these problems will be minor. Designated routes for pedestrian travel consist of existing trails, many with hardened surfaces or are existing trails that have been used for many years. Designated routes do not have any known occurrences of rare plant species on their surface that will be impacted by this use. Continuing pedestrian travel on these routes is not likely to cause any significant impacts to plants or plant communities.

People can be vectors for invasive plants when seeds or other propagules are moved from one area to another. Once established, invasives can out-compete native plants, thereby altering

habitats and indirectly impacting wildlife. The threat of invasive plant establishment will always be an issue requiring annual monitoring, and when necessary, treatment. Staff will work to educate the visiting public to reduce introductions and will also monitor and control invasives.

Soils Impacts:
Soils can be compacted and eroded as a result of continued use of pedestrian routes (Cole and Landres 1995). It is anticipated that some soil erosion will occur as a result of continuing pedestrian access on designated routes. Under current levels of use, impacts to soils (erosion, compaction) are not likely to be significant.

Hydrologic Impacts:
Roads and trails can affect the hydrology of an area, primarily through alteration of drainage patterns. It is anticipated that existing roads and trails will continue to influence hydrology regardless of pedestrian travel. Maintenance will be required to create adequate and proper drainage to avoid hydrologic impacts. Trail construction may also cause erosion and run-off of sediment into nearby waterways from exposed soils.

Since this unit is are fairly flat, erosion is not a large problem, but impacts to wet areas can occur when bridging is inadequate and visitors widen or go off the trail to avoid wet spots. Properly sited, designed, and maintained trails minimize this impact. Based on the current level of use, pedestrian travel is not likely to significantly increase erosion, incision, or stream alteration. Therefore, no significant hydrologic impacts are anticipated from this use.

Habitat Impacts:
Peatlands are particularly vulnerable to damage by visitors who may walk through them or collect plants. At Sunkhaze Meadows Unit, the peatlands are difficult to access due to the large area of wetlands that exist between the streams and the peat domes; there are no designated trails to access these sensitive areas. Plant collecting is also prohibited. Visitors wishing to see a bog can visit the boardwalks that access the nearby Orono Bog.

Wildlife Impacts:
Disturbances vary with the wildlife species involved and the type, level, frequency, duration and the time of year such activities occur. The responses of wildlife to human activities includes: avoidance or departure from the site (Owen 1973, Burger 1981, Kaiser and Fritzell 1984, Korschen et al. 1985, Henson and Grant 1991, Kahl 1991, Klein 1993, Whittaker and Knight 1998), use of sub-optimal habitat (Erwin 1980, Williams and Forbes 1980), altered behavior or habituation to human disturbance (Burger 1981, Korschen et al. 1985, Morton et al. 1989, Ward and Stehn 1989, Havera et al. 1992, Klein 1993), attraction (Whittaker and Knight1998), and an increase in energy expenditure (Morton et al. 1989, Belanger and Bedard 1990). Knight and Cole (1991) suggest recreational activities occurring simultaneously may have a combined negative impact on wildlife. Hammitt and Cole (1998) conclude that the frequent presence of humans in wildland areas can dramatically change the normal behavior of wildlife mostly through “unintentional harassment.” These responses can have negative impacts to wildlife such as mammals becoming habituated to humans making them easier targets for hunters. Human induced avoidance by wildlife can prevent animals from using otherwise suitable habitat.

Seasonal sensitivities can compound the effect of disturbance on wildlife. Examples include regularly flushing birds during nesting or causing mammals to flee during winter months, thereby consuming large amounts of stored fat reserves. Hammitt and Cole (1998) noted that females with young (such as white-tailed deer) are more likely to flee from a disturbance than those without young. Some uses, such as bird observation, are directly focused on viewing certain wildlife species and can cause more significant impacts during the breeding season and winter months.

Trails can disturb wildlife outside the immediate trail corridor (Trails and Wildlife Task Force 1998, Miller et al. 2001). Miller et al. (1998) found bird abundance and nesting activities (including nest success) increased as distance from a recreational trail increased in both grassland and forested habitats. Bird communities in this study were apparently affected by the presence of recreational trails, where "generalists" (e.g., American robins (*Turdus migratorius*)) were found near trails and "specialist" species (e.g., grasshopper sparrows (*Ammodramus savannarum*)) were found farther from trails. Nest predation was also found to be greater near trails (Miller et al. 1998).

Visitors engaged in wildlife observation, photography, environmental education, and interpretation have the potential to impact shorebird, waterfowl, and other migratory bird populations feeding and resting near the trails during certain times of the year. Human disturbance to migratory birds has been documented in many studies in different locations. Conflicts arise when migratory birds and humans are present in the same areas (Boyle and Samson 1985). McNeil et al. (1992) found that many waterfowl species avoid disturbance by feeding at night instead of during the day. Flight in response to disturbance can lower nesting productivity and cause disease and death.

Studying the effects of human visitation on waterbirds at J.N. "Ding" Darling Refuge, Klein (1989) found resident waterbirds to be less sensitive to disturbance than migrants; she also found that sensitivity varied according to species and individuals within species. Herons and bitterns were quite tolerant of people; however, the presence of people did disturb these birds when hunting terrestrial prey. Great blue herons (*Ardea herodias*), tricolored herons (*Egretta tricolor*), great egrets (*Casmerodius albus*), and little blue herons (*E. caerulea*) were disturbed to the point of flight more than other birds. Kushlan (1978) found that the need of these birds to move frequently while feeding may disrupt interspecific and intraspecific relationships. In addition, Batten (1977) and Burger (1981) found that wading birds were extremely sensitive to disturbance in the Northeastern United States.

Klein (1993), in studying waterbird response to human disturbance, found that as intensity of disturbance increased, avoidance response by the birds increased and that out-of-vehicle activity to be more disruptive than vehicular traffic; Freddy et al. (1986) and Vaske et al. (1983) also found the latter to be true. In regards to waterfowl, Klein (1989) found migratory dabbling ducks to be the most sensitive to disturbance and migrant ducks to be more sensitive when they first arrived in the late fall, than later in winter. She also found gulls and sandpipers to be apparently insensitive to human disturbance, with Burger (1981) finding the same to be true for various gull species.

For songbirds, Gutzwiller et al. (1994) found that singing behavior of some species was altered by low levels of human intrusion. Some studies have found that some bird species habituate to repeated intrusion; frequently disturbed individuals of some species have been found to vocalize more aggressively, have higher body masses, or tend to remain in place longer (Cairns and McLaren 1980). Disturbance may affect the reproductive fitness of males by hampering territory defense, male attraction, and other reproductive functions of song (Arcese 1987). Disturbance, which leads to reduced singing activity, will make males rely more heavily on physical deterrents in defending territories which are time and energy consuming (Ewald and Carpenter 1978).

Several studies have examined the effects of recreationists on birds using shallow-water habitats adjacent to trails and roads in the Eastern United States (Burger 1981, Burger 1986, Klein 1993, Burger et al. 1995, Klein et al. 1995, Rodgers and Smith 1995, 1997, Burger and Gochfeld 1998). Overall, the existing research clearly demonstrates that disturbance from recreation activities always have at least temporary effects on the behavior and movement of birds within a habitat or localized area (Burger 1981, 1986, Klein 1993, Burger et al. 1995, Klein et al. 1995, Rodgers and Smith 1997, Burger and Gochfeld 1998). The findings that were reported in these studies are summarized as follows in terms of visitor activity and avian response to disturbance.

Presence: Birds avoided places where people were present and when visitor activity was high (Burger 1981, Klein et al. 1995, Burger and Gochfeld 1998).

Distance: Disturbance increased with decreased distance between visitors and species (Burger 1986), though exact measurements were not reported.

Approach Angle: Visitors directly approaching birds on foot caused more disturbance than visitors driving by in vehicles, stopping vehicles near birds, and stopping vehicles and getting out without approaching birds (Klein 1993). Direct approaches may also cause greater disturbance than tangential approaches to birds (Burger and Gochfeld 1981, Burger et al. 1995, Knight and Cole 1995, Rodgers and Smith 1995, 1997).
Type and Speed of Activity: Joggers and landscapers caused birds to flush more than fishermen, clammers, sunbathers, and some pedestrians, possibly because the former groups move quickly (joggers) or create more noise (landscapers). The latter groups tend to move more slowly or stay in one place for longer periods, and thus birds likely perceive these activities as less threatening (Burger 1981, 1986, Burger et al. 1995, Knight and Cole 1995). Alternatively, birds may tolerate passing by with unabated speed whereas if the activity stops or slacks birds may flush (Burger et al. 1995).

Noise: Noise caused by visitors resulted in increased levels of disturbance (Burger 1986, Klein 1993, Burger and Gochfeld 1998), though noise was not correlated with visitor group size (Burger and Gochfeld 1998).

There are no known federally listed threatened or endangered species occurring on the Sunkhaze Meadows Unit; therefore, this activity is not expected to impact any threatened or endangered species here. Disturbance to other species is expected to be negligible. Trail use may discourage use of habitat by nesting birds very close to the trails, but the area impacted by trails is small

compared to the area available to wildlife away from any trail. In addition, wildlife observers and photographers generally seek to minimize disturbance, as it interferes with their activity.

Summary of Impacts:
We do not expect these disturbances to be significant, i.e. cause wildlife or habitats to be negatively impacted, since current and anticipated levels of use are low. Providing the opportunity for recreational gathering of natural materials on the refuge provides the public with an opportunity to observe wildlife and to view Service wildlife habitat management projects. There have been no indications that the current levels of limited harvesting of these natural materials causes problems for wildlife other than minimal and temporary disturbance caused by the mere presence of humans. Due to the great numbers of mosquitoes and other biting insects during this time period, the actual number of refuge visitors is quite low. Any berry picking that occurs is incidental and is usually limited to areas near roads and trails.

PUBLIC REVIEW AND COMMENT:
As part of the CCP process for Sunkhaze Meadows NWR and Carlton Pond Waterfowl Production Area, this compatibility determination was available for public review and comment for 39 days concurrent with the release of our draft CCP and environmental assessment.

DETERMINATION (check one below):
This use is compatible __X__

This use is not compatible _____

STIPULATIONS NECESSARY TO ENSURE COMPATIBILITY:
On the Sunkhaze Meadows Unit:

- A refuge officer will help to promote compliance with refuge regulations, monitor public use patterns and public safety, and document visitor interactions.

- Refuge staff will promote good harvest practices through communicating with the public when new information on harvesting comes out. Example: when harvesting fiddleheads you should limit take of three heads per plant to ensure a healthy plant in the future (so the plant is not killed). No digging is permitted at any time.

- Refuge staff will continue to monitor the unit for the presence of federally threatened or endangered species and ensure this use continues to have an insignificant impact on wildlife. We may close some or all of this unit to this use if significant wildlife or habitat disturbance is identified.

- The Sunkhaze Meadows Unit will be open to this use during regular refuge hours, sunrise to sunset.

JUSTIFICATION:

Recreational gathering of these materials at the Sunkhaze Meadows Unit will not materially interfere with or detract from the mission of the National Wildlife Refuge System or the purposes for which the refuge was established. As listed in the purposes section of this compatibility determination, the refuge was established and subsequently land was acquired for two main purposes. These uses do not adversely impact the wildlife and habitat protection aspects of the purposes because at the scales and level of current visitor use, wildlife and habitats are not appreciably negatively affected by these uses. We have made this determination based on lack of observed habitat degradation and because the use is focused around established trails. Recreational gathering of the specified materials will not materially interfere with or detract from the endangered species aspect of the refuge's purposes, because there are no federally listed threatened or endangered species that occur on the refuge. Therefore, no significant adverse effects from this use are anticipated. Allowing these uses does not affect CCP goals and objectives as described in the refuge's CCP (USFWS 2013) and may support the refuge's purpose associated with allowing wildlife-oriented recreational opportunities. These activities will not materially interfere with or detract from the mission of the Service, because of the limited impacts to refuge resources and the opportunity to build support for the Refuge System.

SIGNATURE:

Refuge Manager: Beth Goettel (Signature) 8/19/2013 (Date)

CONCURRENCE:

Regional Chief: Scott B. Kahn (Signature) 9/17/2013 (Date)

MANDATORY 10 YEAR RE-EVALUATION DATE: 9/17/2023

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FWS Form 3-2319
02/06

Finding of Appropriateness of a Refuge Use

Refuge Name: Sunkhaze Meadows National Wildlife Refuge

Use: Boating

This exhibit is not required for wildlife-dependent recreational uses, forms of take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision criteria:	YES	NO
(a) Do we have jurisdiction over the use?	X	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	X	
(c) Is the use consistent with applicable Executive orders and Department and Service policies?	X	
(d) Is the use consistent with public safety?	X	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?	X	
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	X	
(g) Is the use manageable within available budget and staff?	X	
(h) Will this be manageable in the future within existing resources?	X	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	X	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D. for description), compatible, wildlife-dependent recreation into the future?	X	

Where we do not have jurisdiction over the use ("no" to (a)), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to (b), (c), or (d)) may not be found appropriate. If the answer is "no" to any of the other questions above, we will **generally** not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes X No ___

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate: _____ **Appropriate:** X

Refuge Manager: Beth Goettel Date: 8/19/13

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use.

If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence.

If found to be **Appropriate**, the refuge supervisor must sign concurrence:

Refuge Supervisor: Graham W. Taylor Date: 9/11/2013

A compatibility determination is required before the use may be allowed.

Justification for a Finding of Appropriateness of a Refuge Use

Refuge Name: Sunkhaze Meadows National Wildlife Refuge

Use: Boating

Narrative:
Boating is an historic use of Sunkhaze Meadows National Wildlife Refuge (refuge) that occurred before the refuge was created. Hunting, fishing, wildlife observation and photography, and environmental education and interpretation are the six priority public uses of the National Wildlife Refuge System (Refuge System). The Refuge System Improvement Act of 1997 instructs refuge managers to seek ways to accommodate those six uses. Motorized and non-motorized boating is an appropriate means of facilitating these priority public uses on the refuge since much of the refuge is only accessible by water. Jet skis will not be permitted on refuge waters due to their environmental impact, noise, speed, and excessive wildlife disturbance. There a currently no motor or speed limitations since the refuge waterways are so narrow and beaver dam obstructions limit their use. The use has been allowed on the refuge since it was established with no significant adverse effects observed. The staff will continue to monitor the use and could implement both motor and speed limitations if wake or speeds become harmful to wildlife or habitat, or in the interest of public safety.

By allowing this use, we are providing opportunities and facilitating refuge programs in a manner and location that offer high-quality, wildlife-dependent recreation and maintains the level of current fish and wildlife values. For these reasons, we have determined that allowing this use is consistent with the U.S. Fish and Wildlife Service policy on the appropriateness of refuge uses.

COMPATIBILITY DETERMINATION

USE: Boating

REFUGE NAME: Sunkhaze Meadows National Wildlife Refuge

DATE ESTABLISHED: November 22, 1988

ESTABLISHING AUTHORITIES:

1. Fish and Wildlife Act of 1956 (16 U.S.C. 742a-742j; 70 Stat. 1119)

2. Refuge Recreation Act of 1962 (16 U.S.C. 460k-460k-4; 76 Stat. 653)

PURPOSE(S) FOR WHICH ESTABLISHED:

1. "... for the development, advancement, management, conservation, and protection of fish and wildlife resources ..." (16 U.S.C. 742f(a)(4)), "... for the benefit of the United States Fish and Wildlife Service, in performing it activities and services. Such acceptance may be subject to the terms of any restrictive or affirmative covenant, or condition of servitude ..." (16 U.S.C. 742f(b)(1) (Fish and Wildlife Act of 1956))

2. "... suitable for -- (1) incidental fish and wildlife-oriented recreational development, (2) the protection of natural resources, (3) the conservation of endangered species or threatened species ..." (16 U.S.C. 460k-1 (Refuge Recreation Act))

MISSION OF THE NATIONAL WILDLIFE REFUGE SYSTEM:

"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."(16 U.S.C. 668dd-668ee) (National Wildlife Refuge System Administration Act of 1966)

DESCRIPTION OF USE:

(a) What is the use? Is the use a priority public use?

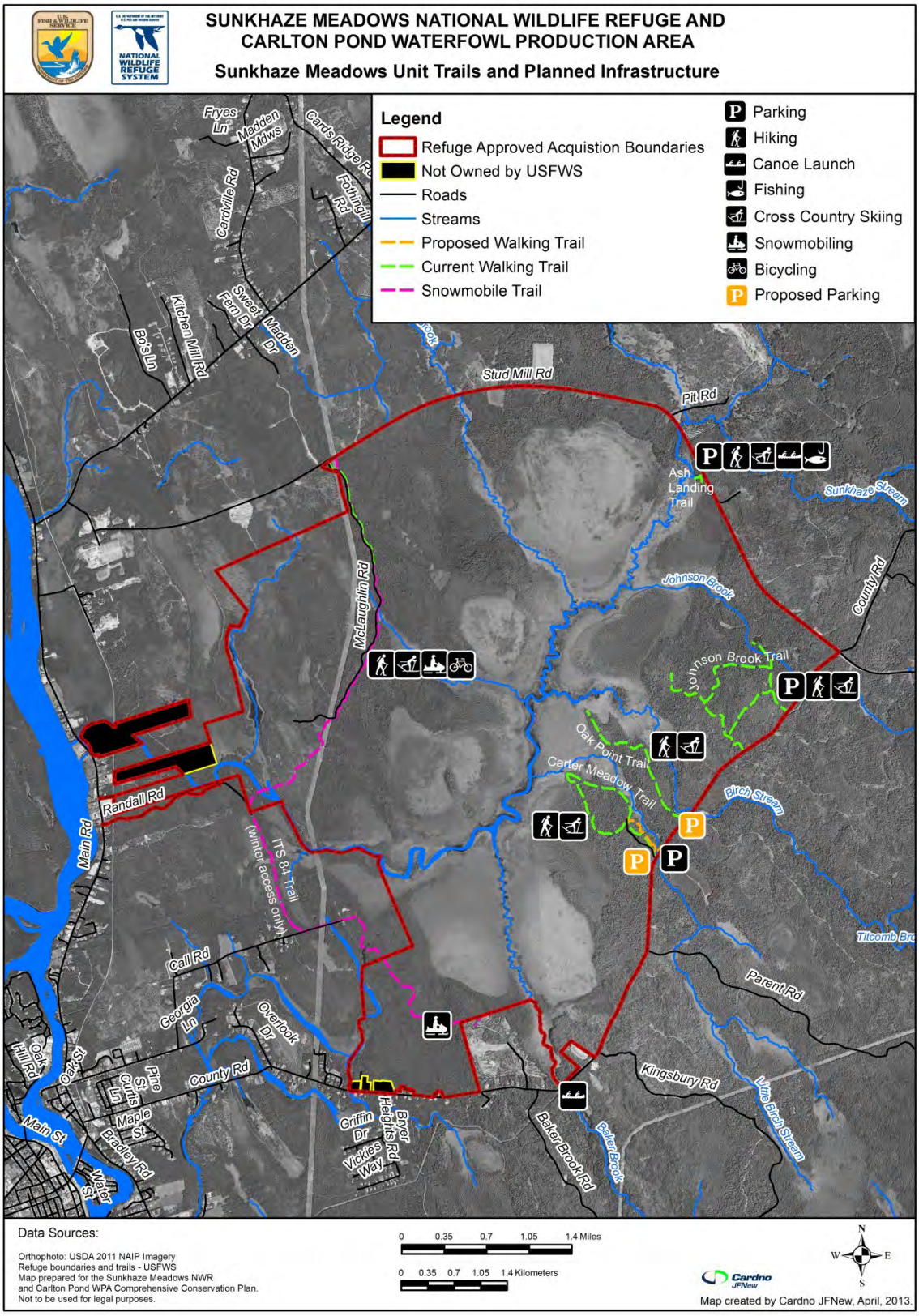
The use is motorized and non-motorized boating. Motorized and non-motorized boating are not a priority public use of the National Wildlife Refuge System under the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd-668ee), as amended by the National Wildlife Refuge System Improvement Act of 1997, however they facilitate priority public uses.

Refuge visitors often use small boats, motorized and non-motorized, on refuge streams to access otherwise inaccessible portions of the refuge in support of fishing, hunting, environmental education, wildlife photography, and wildlife observation.

(b) Where will the use be conducted?

Motorized and non-motorized boating will continue to be allowed on all open waters within the Sunkhaze Meadows Unit of the refuge.

Map B.11.Sunkhaze Stream, its tributaries, and public use facilities within the Sunkhaze Meadows Unit of Sunkhaze Meadows NWR.



(c) When will the use be conducted?
Motorized and non-motorized boating will be allowed year round when waters are ice-free from sunrise to sunset and one hour before and after sunset in support of hunting.

(d) How will the use be conducted?
Visitors will use parking lots at Ash Landing and on the Penobscot River off Route 2 near the mouth of Sunkhaze Stream. A trailhead kiosk is located at Ash Landing and a roadside interpretive display is located at the Route 2 site. At present, trailered boats can only be launched at the Route 2 site, and entry from there includes traversing a shallow area in the mouth of the stream, limiting boat and engine size most of the year; the exception will be when the Penobscot River floods in spring, backing up into the Sunkhaze Meadows and flooding it. At that time, larger boats with 25 horse power engines may use the area. Canoes and kayaks launched from the Route 2 site have a long way to paddle on the Penobscot to get to the mouth of Sunkhaze Stream. At Ash Landing, boats and motors must be carried a small distance from the parking lot to reach the stream. In addition, the upper portion of Sunkhaze Stream south of Ash Landing contains a dozen or so beaver dams to be passed over. These conditions generally limit the size of boats using the stream within the refuge to john boats, canoes, and kayaks, with no, or relatively small motors.

All boats launching or landings on refuge lands must follow State boating regulations and, if applicable, show State registration. Maine Statute Title 38: 419B-420 prohibits the transport of any aquatic plant or parts of any aquatic plant, including roots, rhizomes, stems, leaves or seeds, on the outside of a vehicle, boat, personal watercraft, boat trailer or other equipment on a public road. The public should inspect all boats and boat trailers and clean them of aquatic invasive species before launching at refuge sites. That cleaning should take place on dry ground well away from the water. Nonnative, invasive plants or animals on boats, trailers, diving equipment, or in bait buckets can disrupt aquatic ecosystems and negatively affect native fish and plant species. Sunkhaze Stream and its associated tributaries appear to be relatively free of aquatic invasive plants, and cleaning boats, trailers, and other equipment will help to keep them that way. Signs, public outreach, and periodic enforcement will help educate and remind the public of the importance of inspecting and cleaning watercraft and Maine State laws prohibiting transport of aquatic plants.

(e) Why is the use being proposed?
Hunting, fishing, wildlife observation and photography, and environmental education and interpretation are the six priority public uses of the Refuge System. Where these uses are determined to be compatible, they are to receive enhanced consideration over other uses. Motorized and non-motorized boating facilitate these priority public uses. By allowing this use, we are providing opportunities and facilitating refuge programs in a manner and location that offer high quality, wildlife-dependent recreation and maintain the level of current fish and wildlife values. Most of the refuge will be inaccessible to the public without using a boat. This use may also provide individuals with a connection to the natural world and an increased appreciation of natural resources, in addition to exposing them to the Refuge System.

AVAILABLITY OF RESOURCES:
Facilities or materials needed to support boating include annual maintenance of the parking and trail at Ash Landing, signing and monitoring of boating access points including the launch on Route 2, and routine law enforcement patrols. The refuge plans to upgrade the hand carry boat launch and access trail at Ash Landing which is a funded project in the 2012 budget. These costs ($7,000) are not included in the budget projection for public fishing and will be a one year cost.

Annual maintenance for parking area and trail to Ash Landing boat launch:	$500
Signing and monitoring boat access sites:	$300
Law enforcement patrol:	$2,000
Update interpretive/informational trailhead signage	$600
Estimated Program Cost:	**$3,400**

ANTICIPATED IMPACTS OF THE USE:

Accidental introduction of invasive plants, pathogens, or exotic invertebrates, **attached to fishing boats:** With the exception of a few isolated occurrences of purple loosestrife, refuge waters appear to be relatively free of invasive aquatic plants and mollusks. However, we have not carried out extensive surveys of aquatic invasive species. We can mitigate the potential for introductions by having boaters clean their boats before launching and after retrieving. We will also post launch sites with educational materials and have law enforcement officers make courtesy spot checks of vessels for compliance and to educate boaters on proper methods for checking for aquatic hitchhikers.

Disturbance of wildlife: Boating seasons in Maine coincide in part with spring-early summer nesting and brood-rearing periods for many species of aquatic-dependent birds. Anglers and other boaters may disturb nesting birds by approaching too closely to nests, causing nesting birds to flush. Flushing may expose eggs to predation or cooling, resulting in egg mortality. If this becomes a problem we will close refuge areas seasonally to boating around sensitive nest sites, in conjunction with the state of Maine if necessary.

Though motorized boats generally have a greater impact on wildlife, even non-motorized boats can alter distribution, reduce use of particular habitats by waterfowl and other birds, alter feeding behavior and nutritional status, and cause premature departure from areas (Knight and Cole 1995). However, compared to motorboats, canoes and kayaks appear to cause fewer disturbances to most wildlife species (Delong 2002). The refuge waterways restrict motor and boat size due to the number of beaver dams you must cross. The only time a larger boat can access the refuge is during spring flood, before most migratory species have arrived. If we encounter problems in the future, we could implement a size limit; thus far it has not been an issue and most people don't use a motor due to the hassle.

Negative impacts on water quality from motorboat and other pollutants, human waste, and litter: Extensive water quality testing on Sunkhaze Stream and its tributaries has not been carried out. The levels of pollutants from boat fuel and impacts on local aquatic systems are unknown. Hydrocarbon contamination can be harmful to fish. Currently most boating is non-motorized so we feel there is little contamination coming from this source. We will initiate public outreach and education on littering, pollutants, and proper waste disposal if the use increases substantially above current use levels to help mitigate water quality impacts. Water quality testing will be carried out as funding levels permit.

Bank and trail erosion from human activity (boat landings, boat wakes) may increase aquatic sediment loads of streams and rivers, or alter riparian or streamside habitat/vegetation in ways harmful to fish or other wildlife. Boat access will be restricted to designated areas only. The trail

to the Ash Landing boat launch will be 'hardened' to further reduce any erosion potential. Therefore, at current levels of use, we do not expect trail erosion to increase because of foot traffic related to boating. The majority of boat use that occurs on the refuge is non-motorized through the use of canoes and kayaks. When motors are used they are either low horsepower or electric trolling motors, therefore we do not anticipate any significant bank erosion due to boat wakes.

Negative impacts from fishing boats and foot traffic to sensitive wetlands or peatlands and rare wetland plants: Boat access sites and trails are located away from sensitive wetlands, peatlands, and rare plants.

PUBLIC REVIEW AND COMMENT:
As part of the comprehensive conservation plan (CCP) process for Sunkhaze Meadows NWR and Carlton Pond Waterfowl Production Area, this compatibility determination was available for public review and comment for 39 days concurrent with the release of our draft CCP and environmental assessment.

DETERMINATION (check one below):
This use is compatible __X__

This use is not compatible _____

STIPULATIONS NECESSARY TO ENSURE COMPATIBILITY:

- Boating access areas have been designated and signed.
- Refuge staff will continue to monitor the refuge for the presence of threatened or endangered species and ensure that boat use has no significant impact on them. If needed in the future, closure of any stream or portion thereof will be coordinated with the State of Maine which maintains jurisdiction in navigable waters.
- Motor or speed limitations could be implemented if wake or speeds become harmful to wildlife or habitat, or in the interest of public safety.
- Jet skis will not be permitted on refuge waters due to the potential for environmental impact, noise, speed, and excessive wildlife disturbance.
- All boats, trailers, motors, and fishing gear will be encouraged to be inspected by the owner for plant material and cleaned prior to launching and after retrieval.
- Compliance with regulations will be achieved through education, signage and law enforcement which will result in minimizing negative impacts to refuge habitat and wildlife.
- The refuge will be open to this use during regular refuge hours, sunrise to sunset.

JUSTIFICATION:

While boating is not a priority public use of the National Wildlife Refuge System (The National Wildlife Refuge System Administration Act of 1966, as amended by the National Wildlife Refuge System Improvement Act of 1997), it does facilitate priority public uses, particularly at the Sunkhaze Meadows Unit which largely consists of wetlands and streams.

Allowing boating at Sunkhaze NWR will not materially interfere with, or detract from, the mission of the National Wildlife Refuge System of the purposes for which the refuge was established. As listed in the purposes section of this compatibility determination, the refuge was established and subsequently land was acquired for two main purposes. As discussed under the section on anticipated impacts above, boating is a use that supports wildlife-dependent priority public uses with minimal adverse impacts on refuge resources. Use by boaters is estimated to be less than 700 visits per year. Due to numerous other opportunities in the area, the demand for boating is expected to be relatively constant in the future. Waterfowl use tributary stream and pothole habitats in the meadows portion of the refuge more heavily than Sunkhaze Stream where most boating occurs, so minimal and temporary disturbance of waterfowl is anticipated from boating activity there. Erosion of stream banks by wakes from motorized boats is insignificant since most boating is non-motorized and dense vegetation and thickly matted roots protect the bog edge. Because of this, it is consistent with the wildlife and habitat aspects of the refuge's purposes, the Service policy on compatible uses, the National Wildlife Refuge System Improvement Act of 1997, and the broad management objectives of the National Wildlife Refuge System.

Boating will not materially interfere with or detract from the endangered species aspect of the refuge's purposes, because there are no federally listed threatened or endangered species known to occur on the refuge. Therefore, no significant adverse effects from boating are anticipated. By supporting priority public uses, allowing this use supports CCP goals and objectives as described in the refuge's CCP (USFWS 2013) and the refuge's purpose associated with allowing wildlife-oriented recreational opportunities. This activity will not materially interfere with or detract from the mission of the Refuge System, because of the limited impacts to refuge resources, it facilitates priority public uses, and the opportunity to attract visitors to the refuge and build support for the Refuge System.

SIGNATURE:

Refuge Manager: Beth Goettel (Signature) 8/19/13 (Date)

CONCURRENCE:

Regional Chief: Scott B. Kahn (Signature) 9/17/2013 (Date)

MANDATORY 10 YEAR RE-EVALUATION DATE: 9/17/2023

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——— 1992. Sunkhaze Meadows National Wildlife Refuge Preliminary Station Management Plan.

——— 1993. Sunkhaze Meadows National Wildlife Refuge Annual Narratives 1989-1993. Unpublished reports in refuge files.

——— 2013. Sunkhaze Meadows National Wildlife Refuge and Carlton Pond Waterfowl Production Area Draft Comprehensive Conservation Plan and Environmental Assessment. April 2013.

FWS Form 3-2319
02/06

Finding of Appropriateness of a Refuge Use

Refuge Name: Sunkhaze Meadows National Wildlife Refuge

Use: Privately owned recreational cabin

This exhibit is not required for wildlife-dependent recreational uses, forms of take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision criteria:	YES	NO
(a) Do we have jurisdiction over the use?	X	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	X	
(c) Is the use consistent with applicable Executive orders and Department and Service policies?	X	
(d) Is the use consistent with public safety?	X	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?	X	
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	X	
(g) Is the use manageable within available budget and staff?	X	
(h) Will this be manageable in the future within existing resources?	X	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	X	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D. for description), compatible, wildlife-dependent recreation into the future?	X	

Where we do not have jurisdiction over the use ("no" to (a)), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to (b), (c), or (d)) may not be found appropriate. If the answer is "no" to any of the other questions above, we will **generally** not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes X No ___

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate: ____ **Appropriate:** X

Refuge Manager: Beth Goettel Date: 8/19/2013

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use.

If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence.

If found to be **Appropriate**, the refuge supervisor must sign concurrence:

Refuge Supervisor: Graham W. Taylor Date: 9/11/13

A compatibility determination is required before the use may be allowed.

Justification for a Finding of Appropriateness of a Refuge Use

Refuge Name: Sunkhaze Meadows National Wildlife Refuge

Use: Privately-owned recreational cabin

Narrative:
The Spruce cabin is one of five cabins that were on Sunkhaze Meadows National Wildlife Refuge (refuge) at the time of its establishment. The cabin has occupied leased land from Diamond Occidental Forest Inc., the previous landowner, for many decades. We phased out the other four private cabins as the historic lease holders declined the option to obtain or renew their special use permits (SUP). One cabin was purchased during refuge acquisition, and the other three were purchased in the years following refuge establishment. One privately-owned cabin remains. We manage this use by issuing a SUP and charging the owner an annual fee. The fee is adjusted annually to reflect changes in the cost of living. As part of phasing out use of private cabins, we do not intend to issue SUPs to anyone but the present owner. We expect to purchase this last cabin when the owner is no longer interested in renewing the annual SUP. In the meantime, this use has little impact on refuge management activities, wildlife, or wildlife habitat since the site has been occupied for nearly 100 years. As documented in this form, continuing to allow this use is consistent with the U.S. Fish and Wildlife Service's policy on the appropriateness of refuge uses (603 FW 1).

COMPATIBILITY DETERMINATION

USE: Privately-owned Recreational Cabin

REFUGE NAME: Sunkhaze Meadows National Wildlife Refuge

DATE ESTABLISHED: November 22, 1988

ESTABLISHING AUTHORITIES:

1. Fish and Wildlife Act of 1956 (16 U.S.C. 742a-742j; 70 Stat. 1119)

2. Refuge Recreation Act of 1962 (16 U.S.C. 460k-460k-4; 76 Stat. 653)

PURPOSE(S) FOR WHICH ESTABLISHED:

1. "... for the development, advancement, management, conservation, and protection of fish and wildlife resources ..." (16 U.S.C. 742f(a)(4)), "... for the benefit of the United States Fish and Wildlife Service, in performing it activities and services. Such acceptance may be subject to the terms of any restrictive or affirmative covenant, or condition of servitude ..." (16 U.S.C. 742f(b)(1) (Fish and Wildlife Act of 1956))

2. "... suitable for -- (1) incidental fish and wildlife-oriented recreational development, (2) the protection of natural resources, (3) the conservation of endangered species or threatened species ..." (16 U.S.C. 460k-1 (Refuge Recreation Act))

MISSION OF THE NATIONAL WILDLIFE REFUGE SYSTEM:

"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." (16 U.S.C. 668dd-668ee) (National Wildlife Refuge System Administration Act of 1966)

DESCRIPTION OF USE:

(a) What is the use? Is the use a priority public use?

The use is the occupancy and use of a privately-owned recreational cabin. It is not a priority public use of the National Wildlife Refuge System, under the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd-668ee), as amended by the National Wildlife Refuge System Improvement Act of 1997.

The cabin is one of five cabins that were on the refuge at the time of its establishment. The cabin has occupied land leased from Diamond Occidental Forest Inc., the previous landowner, for many decades. We phased out the other four private cabins as the historic lease holders declined the option to obtain or renew their special use permits (SUP). One cabin was purchased during refuge acquisition, and the other three were purchased in the years following refuge establishment. A single cabin remains, which is managed through the issuance of a SUP and charging of an annual fee. The fee is adjusted annually to reflect changes in the cost of living. As part of phasing out the use of private cabins, we do not intend to issue SUPs to anyone but the present owner. We expect to purchase this last cabin when the owner is no longer interested in renewing the annual SUP.

(b) Where will the use be conducted?
The use will occur at the cabin site located on Carter Meadow Road just north of the County Road in the town of Milford.

(c) When will the use be conducted?
The cabin is occupied sporadically throughout the year with highest use occurring during the summer months. The cabin has been used during these times at this site for almost 100 years.

(d) How will the use be conducted?
Under Service land ownership, the use and occupancy of this camp will be administered through the issuance of an SUP, the conditions of which are analogous to the former lease. We will review and issue the permit annually. The annual fee is adjusted annually to reflect changes in the cost of living. The cabin owner is allowed to access the cabin off-trail; however, off-trail use is limited to pedestrian access only (e.g., walking, snowshoeing, skiing).

As part of phasing out use of private cabins, we do not intend to issue SUPs to anyone but the present owner. We expect to purchase this last cabin when the owner is no longer interested in renewing the annual SUP.

(e) Why is the use being proposed?
This use existed before refuge ownership and has been managed in this manner since refuge establishment in 1988. At the time of Service acquisition from Diamond Occidental Forest Inc. there were five cabins, built by families that were leasing the underlying land. Since refuge establishment, the Service has purchased four of the cabins and phased them out. By working with the last cabin owner, the Service is following through on earlier commitments which were made at the time of sale.

AVAILABLITY OF RESOURCES:
The refuge staff time associated with administering this use primarily relates to processing annual permit fees, answering the questions of the cabin owner concerning conditions of the permits, monitoring compliance with those conditions, and monitoring potential impacts of the use on refuge resources and visitors. Costs associated with administration of this use include:

Reviewing SUP conditions, landowner contacts:	$100	GS-13 Refuge Manager
Issuing SUP:	$30	GS-6 Administrative Assistant
Cabin Monitoring:	$200	GS-9 Refuge Officer
Total:	**$330**	

Based on a review of the budget allocated for management of this cabin, funding is adequate to ensure compatibility, and to administer and manage the use listed. Our existing staff and budget have provided sufficient resources to manage this use historically.

ANTICIPATED IMPACTS OF THE USE:
This cabin site has little impact on refuge management activities, wildlife, or wildlife habitat since the site has been occupied for nearly 100 years. The cabin is located along a road which provides walking access to Carter Meadow Trail which is adjacent to the cabin. Activities by the

cabin owner do not differ substantially in intensity from those of the general public in allowed, daily uses. The occasional occupancy of the cabin could disturb resident wildlife, such as chipmunks, squirrels, mice, skunks, and a few species of songbirds, but these impacts will be temporary, localized, and not significant. No impacts are expected on any threatened or endangered species, whether federally or State listed species.

PUBLIC REVIEW AND COMMENT:
As part of the comprehensive conservation plan (CCP) process for Sunkhaze Meadows NWR and Carlton Pond Waterfowl Production Area, this compatibility determination was available for public review and comment for 39 days concurrent with the release of our draft CCP and environmental assessment.

DETERMINATION (check one below):
This use is compatible __X__

This use is not compatible _____

STIPULATIONS NECESSARY TO ENSURE COMPATIBILITY
The conditions for the SUP for the cabin will be reviewed annually to ensure continued compatibility. Current conditions of the permit include:

- The permittee is responsible for removing all trash from the refuge and disposing of it in approved trash dumps.
- Refuge staff will inspect the cabin site at least once a year to ensure that all provisions and conditions of the SUP are being followed. If conditions are not being met, the permittee will be notified in writing and given a minimum of 30 days to comply. Failure to do so will result in revocation of the permit.
- The permittee is responsible for the payment of personal property tax as assessed by and to the town of Milford, Maine. Failure to pay will result in revocation of the permit.
- The permit does not grant the permittee the right to erect any additional buildings or improvements to the cabin site without prior notification and approval of the refuge manager.

JUSTIFICATION:
This use has been determined to be compatible, provided that the conditions of the SUP are implemented. The use will not pose significant adverse effects on trust species or other refuge resources, will not interfere with public use of the refuge, or cause an undue administrative burden. For these reasons, we have determined that continuing to allow this use on the refuge will not materially interfere with, or detract from, the mission of the National Wildlife Refuge System or the purposes for which the refuge was established

SIGNATURE:

Refuge Manager: Beth Goettel (Signature) 8/19/2013 (Date)

CONCURRENCE:

Regional Chief: Scott B. Kahn (Signature) 9/17/2013 (Date)

MANDATORY 10 YEAR RE-EVALUATION DATE: 9/17/2023

FWS Form 3-2319
02/06

Finding of Appropriateness of a Refuge Use

Refuge Name: Sunkhaze Meadows National Wildlife Refuge

Use: Bicycling

This exhibit is not required for wildlife-dependent recreational uses, forms of take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision criteria:	YES	NO
(a) Do we have jurisdiction over the use?	X	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	X	
(c) Is the use consistent with applicable Executive orders and Department and Service policies?	X	
(d) Is the use consistent with public safety?	X	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?	X	
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	X	
(g) Is the use manageable within available budget and staff?	X	
(h) Will this be manageable in the future within existing resources?	X	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	X	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D. for description), compatible, wildlife-dependent recreation into the future?	X	

Where we do not have jurisdiction over the use ("no" to (a)), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to (b), (c), or (d)) may not be found appropriate. If the answer is "no" to any of the other questions above, we will **generally** not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes X No ___

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate: ____ **Appropriate:** X

Refuge Manager: Beth Goettel Date: 8/19/13

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use.

If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence.

If found to be **Appropriate**, the refuge supervisor must sign concurrence:

Refuge Supervisor: Graham W. Taylor Date: 9/11/13

A compatibility determination is required before the use may be allowed.

Justification for a Finding of Appropriateness of a Refuge Use

Refuge Name: Sunkhaze Meadows National Wildlife Refuge

Use: Bicycling

Narrative:
Bicycling is an historic recreational use of Sunkhaze Meadows National Wildlife Refuge (refuge) that occurred before the refuge was created, and has occurred on the refuge since its establishment. Hunting, fishing, wildlife observation and photography, and environmental education and interpretation are the six priority public uses of the National Wildlife Refuge System (Refuge System). The Refuge System Improvement Act of 1997 instructs refuge managers to seek ways to accommodate those six uses. Bicycling can facilitate these priority public uses and provide the public with an additional way to enjoy the great outdoors. This use is also consistent with the environmental assessment prepared for the refuge's establishment (USFWS 1988, pg. 35). Current levels of this use are low and not expected to increase substantially. No adverse impacts have been observed.

For these reasons, we have found that continuing to allow this use is consistent with the U.S. Fish and Wildlife Service's policy on the appropriateness of refuge uses (603 FW 1).

Reference:
U.S. Fish and Wildlife Service (USFWS). 1988. Final environmental assessment: proposal to establish Sunkhaze Meadows National Wildlife Refuge, Penobscot County, Maine. U.S. Department of the Interior, U.S. Fish and Wildlife Service, Region 5. Newton Corner, Massachusetts. 56 pp.

COMPATIBILITY DETERMINATION

USE: Bicycling

REFUGE NAME: Sunkhaze Meadows National Wildlife Refuge

DATE ESTABLISHED: November 22, 1988

ESTABLISHING AUTHORITIES:

1. Fish and Wildlife Act of 1956 (16 U.S.C. 742a-742j; 70 Stat. 1119)

2. Refuge Recreation Act of 1962 (16 U.S.C. 460k-460k-4; 76 Stat. 653)

PURPOSE(S) FOR WHICH ESTABLISHED:

1. "... for the development, advancement, management, conservation, and protection of fish and wildlife resources ..." (16 U.S.C. 742f(a)(4)) "... for the benefit of the United States Fish and Wildlife Service, in performing it activities and services. Such acceptance may be subject to the terms of any restrictive or affirmative covenant, or condition of servitude ..." (16 U.S.C. 742f(b)(1) (Fish and Wildlife Act of 1956))

2. "... suitable for -- (1) incidental fish and wildlife-oriented recreational development, (2) the protection of natural resources, (3) the conservation of endangered species or threatened species ..." (16 U.S.C. 460k-1 (Refuge Recreation Act))

MISSION OF THE NATIONAL WILDLIFE REFUGE SYSTEM:
"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." (16 U.S.C. 668dd-668ee) (National Wildlife Refuge System Administration Act of 1966)

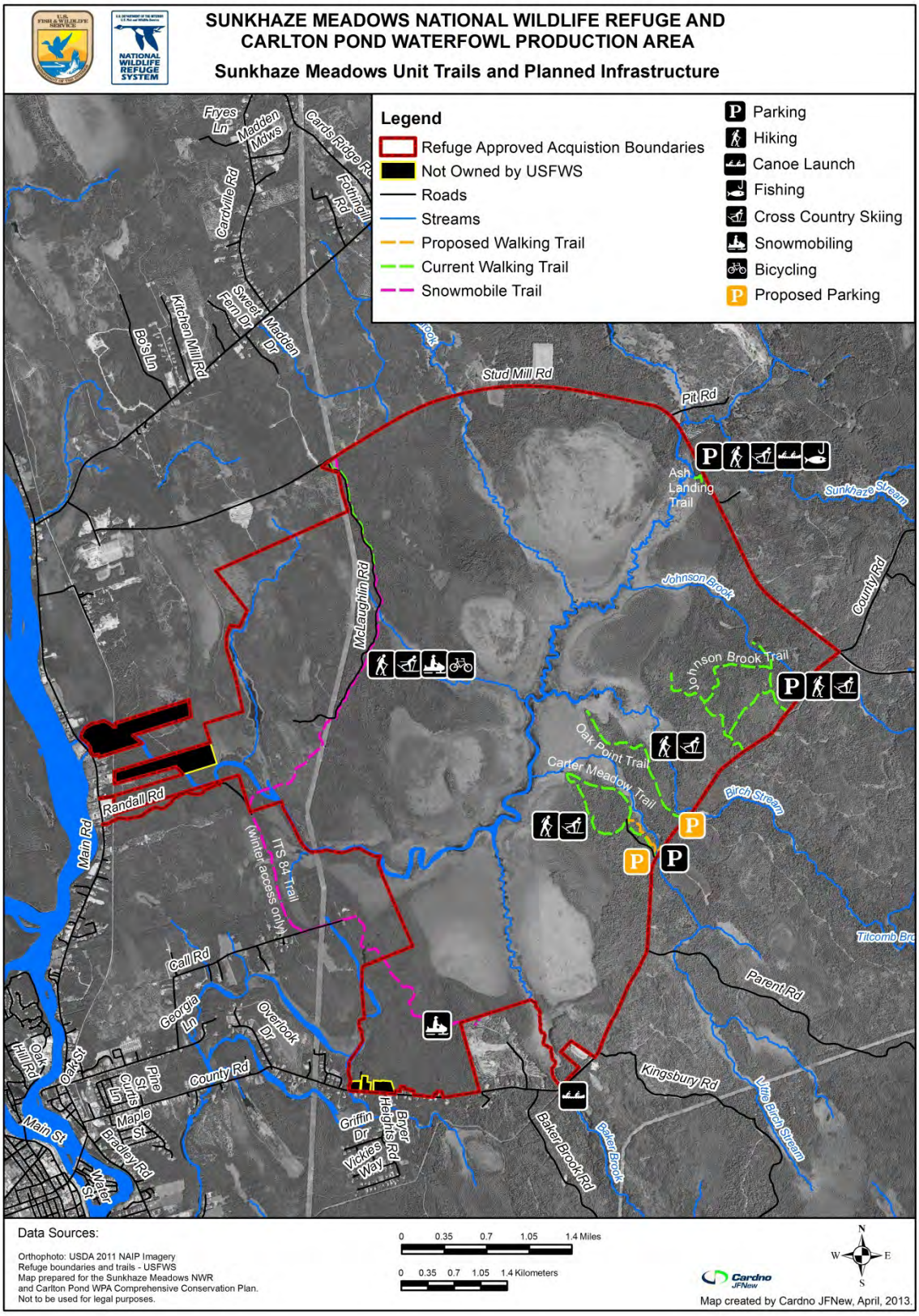
DESCRIPTION OF USE:

(a) What is the use? Is the use a priority public use?
Allow bicycling at Sunkhaze Meadows NWR, only on McLaughlin Road. This use is not a priority public use of National Wildlife Refuge System under the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd-668ee), as amended by the National Wildlife Refuge System Improvement Act of 1997 (Public Law 105-57).

(b) Where will the use be conducted?
Bicycling will be limited to the dirt-surfaced McLaughlin Road, where this use has been allowed in the past. Bicycling on the hiking trails or off-trail will not be allowed.

(c) When will the use be conducted?
Use will be allowed during the refuge's normal open hours. The refuge is open daily sunrise to sunset. People bicycle in every season except winter, when snow cover impedes this activity. There is a locked gate on the McLaughlin Road intended to exclude cars and trucks to protect the road, especially during mud season, but bicycles will be able to pass. This gate is left open during the hunting season.

Map B.12. Trail where bicycling is authorized at the Sunkhaze Meadows Unit of Sunkhaze Meadows NWR.



(d) How will the use be conducted?
Bicyclists will either drive with bikes on car racks and park at Ash Landing, or ride for many miles on other dirt roads to get to the McLaughlin Road. The use will be self-regulating, with signs and brochures indicating the availability of this road for this use. Should damage be caused from bicycles using the road when it is very muddy, signs will be put up to close the road to bicycles during particularly muddy time periods. If bicyclists go on trails closed to bicycling or off-trail, our law enforcement officer will enforce refuge restrictions.

Groups of 10 cyclists or more will be required to obtain a special use permit (SUP), allowing the refuge to monitor how much of this kind of use is occurring. No motorcycles or engine powered cycles of any kind will be allowed.

(e) Why is the use being proposed?
This is an ongoing use of the refuge, and has been occurring without any evidence that it is disruptive or causing any damage. Bicyclists currently bike on the dirt roads bordering and surrounding the Sunkhaze Meadows Unit, County Road and Stud Mill Road. Allowing bicycling on the dirt McLaughlin Road increases their options and introduces them to the refuge, encouraging them to engage in wildlife observation. Allowing it will encourage those people who enjoy the outdoor sport of bicycling to visit the refuge and enjoy it.

AVAILABLITY OF RESOURCES:
The refuge maintains the McLaughlin Road for other management purposes. Allowing occasional bicycles on this road will not increase the maintenance or operational needs.

Law Enforcement Patrol:	$800
Estimated Total:	**$800**

Based on a review of the budget allocated for management of this activity, I certify that funding is adequate to ensure compatibility, administer and manage the use listed. Our existing staff and budget have provided sufficient resources to manage this use historically.

ANTICIPATED IMPACTS OF THE USE:
Bicycling has the potential to affect a variety of migratory and resident wildlife and their habitats. Possible negative effects include disturbing wildlife, removing or trampling vegetation, littering, vandalism, and entering closed areas. Refuge staff will monitor the impacts of this use on McLaughlin Road to assess potential negative effects. In the event of persistent disturbance to habitat or wildlife, the activity will be restricted or discontinued.

Impacts on Soils:
Bicycle wheels can cause physical impacts to soil surfaces. Cessford (1995) notes the shearing action of wheels creates damage to roads and trails, which increases when conditions are wet or when traveling up a steep slope. When traveling down slope, skidding with hard braking can result in loosening soil surfaces, which leads to rutting and erosion by channeling water down wheel ruts. If braking is not performed on downhill travel, the impact of tires on the slope will be much less damaging (Cessford 1995). Since McLaughlin Road is relatively flat and is a hardened

surface (gravel and compacted dirt) designed to withstand truck traffic, this is not expected to be a major problem.

Impacts on Hydrology and Water Quality:
This use has the potential to introduce soil sedimentation from bicycling into small streams and wetlands. The refuge minimizes adverse effects on water resources in a variety of ways. Refuge staff routinely monitor McLaughlin Road for damage and remediate problem areas as needed. These activities include maintenance of culverts, adding gravel and grading as necessary to control ruts, and brushing-in areas where "bootleg" trails are becoming evident. Through regular maintenance refuge staff will ensure any potential negative effects are avoided or minimized

As noted above, sedimentation problems will be minimized because McLaughlin Road is relatively flat and has hardened surfaces. Impacts will be more severe if cyclists go off road on existing trails or create "bootleg" trails. These activities are not allowed and will be dealt with by law enforcement.

Impacts on Vegetation:
Bicycle use can cause compaction of presently uncompacted soils, particularly when soils are wet, which can degrade plant communities associated with fragile organic soils. Soil compaction can diminish the soil porosity, aeration, and nutrient availability. These directly affect plant growth and survival (Kuss 1986). Compaction can also limit the re-colonization of areas due to increased difficulty for root growth and penetration in the affected soils (Hammitt and Cole 1998). Kuss (1986) found plant species adapted to wet or moist habitats are the most sensitive, and increased moisture content reduces the ability of the soil to support recreational traffic.

It is anticipated that bicycling will have no impacts on refuge plant communities, since bicycling is restricted to the road surface where the soil is already compacted and there are no plants. No rare plants have been documented in habitat adjacent to McLaughlin Road. Impacts of off-trail bike riding can be minimized through proper law enforcement.

Exposed soil and an abundance of sunlight along roads and trails provide ideal conditions for the establishment of invasive plant species. Bicycle use may impact vegetation and create bare soil conditions, thus creating conducive conditions for invasive species growth. Invasions result from the use of foreign material to construct and maintain roads and trails, and from seed transport via visitors and vehicles traveling on roads and trails.

Invasive plants, if allowed to establish and spread, can cause major damage to native plant assemblages and the wildlife they support. We will monitor for invasive species and control or eliminate them annually. We will take proper care in cleaning and maintaining all refuge equipment to avoid introduction or transport of invasive plants through refuge- or volunteer-based trail maintenance programs. Based on current monitoring results, invasive species presence along McLaughlin Road is low. Therefore it is likely that the current levels of bicycle use and all other public uses permitted here are not causing significant increases in invasive plants relative to the current vegetative community on designated routes.

The refuge minimizes adverse effects on vegetation in a variety of ways. Refuge staff routinely monitor McLaughlin Road for damage and remediate problem areas as needed. Staff and volunteers also monitor the refuge for the presence of invasive species with the intent of controlling or eliminating them. Because bicycle use is limited to an existing road of packed earth or gravel, direct effects of vegetation impacts will be minimal.

If future evidence of unacceptable adverse impacts appears, we will close McLaughlin Road to this use.

Impacts on Wildlife:
Disturbances vary with the wildlife species involved and the type, level, frequency, duration and the time of year that human activities occur. The responses of wildlife to human activities include avoidance or departure from the site (Owen 1973, Burger 1981, Kaiser and Fritzell 1984, Korschen et al. 1985, Henson and Grant 1991, Kahl 1991, Klein 1993, Whittaker and Knight 1998), the use of sub-optimal habitat (Erwin 1980, Williams and Forbes 1980), altered behavior or habituation (Burger 1981, Korschen et al. 1985, Morton et al. 1989, Ward and Stehn 1989, Havera et al. 1992, Klein 1993, Whittaker and Knight 1998), attraction (Whittaker and Knight 1998), and an increase in energy expenditure (Morton et al. 1989, Belanger and Bedard 1990). Mammals may become habituated to humans making them easier targets for hunters. Disturbance can cause shifts in habitat use, abandonment of habitat and increased energy demands on affected wildlife (Knight and Cole 1991).

The effects of roads and trails on plants and animals are complex and not limited to the trail width. Trail use can disturb areas outside the immediate trail corridor (Trails and Wildlife Task Force 1998, Miller et al. 2001). Miller et al. (1998) describe a 75-meter zone of influence where bird abundance and nesting activities (including nest success) were found to increase as distance from a recreational trail increased in both grassland and forested habitats. Bird communities in this study were apparently affected by the presence of recreational roads and trails, where common species (e.g., American robins) were found near trails and rare species (e.g., grasshopper sparrows) were found farther from trails. Songbird nest failure was also greater near trails (Miller et al. 1998).

Disturbance may affect the reproductive fitness of males by hampering territory defense, male attraction and other reproductive functions of song (Arcese 1987). Disturbance, which leads to reduced singing activity, makes males rely more heavily on physical deterrents in defending territories, which are time- and energy-consuming (Ewald and Carpenter 1978).

Noise caused by visitors resulted in increased levels of disturbance (Burger 1986, Klein 1993, Burger and Gochfeld 1998), though noise was not correlated with visitor group size (Burger and Gochfeld 1998).

Knight and Cole (1991) suggest recreational activities occurring simultaneously may have a combined negative impact on wildlife. Hammitt and Cole (1998) conclude that the frequent presence of humans in ‘wildland’ areas can dramatically change the normal behavior of wildlife mostly through ‘unintentional harassment.’

Seasonal sensitivities can compound the effect of disturbance on wildlife. Examples include regularly flushing birds during nesting or causing mammals to flee during winter months, thereby consuming large amounts of stored fat reserves. Hammitt and Cole (1998) note that females with young (such as white-tailed deer) are more likely to flee from a disturbance than those without young. Some uses, such as bird observation, are directly focused on viewing certain wildlife species and can cause more significant impacts during breeding season.

Wildlife associated with aquatic habitats may also be affected by bicycles on trails. Impacts may be indirectly caused by erosion and subsequent sedimentation of streams and vernal pools as a result of poorly designed trails and bicycle travel over bare soils and around drainages. Increased sediment loads can reduce aquatic vegetation and dissolved oxygen concentrations (Sadoway 1986). Sedimentation can directly kill aquatic invertebrates, affecting the success of amphibian larvae and adults (Sadoway 1986). Observations by refuge staff in 2002 document numerous occurrences of amphibian egg masses that failed after becoming coated in sediment from eroding trails and roads nearby. Bartgis and Berdine (1991) report that sedimentation was damaging habitat in Canaan Valley and could cause impacts to rare plants, impair water quality and possibly affect habitat of the southern water shrew (*Sorex palustris punctulatus*), a State species of concern. This was a direct result of vehicle use and road construction prior to the refuge's acquisition of the property. Trail work conducted since 2002 has begun to address sedimentation and erosion issues on refuge trails. Because trails designated for bicycle use are upland areas or locations of existing (compacted) logging roads, the use of bicycles is not expected to significantly increase erosion or sedimentation problems. Through proper trail maintenance and construction, trail drainage will be improved to minimize the effects of erosion and sedimentation on wildlife.

Short-term localized adverse impacts to fish populations also may result from soil erosion and sedimentation into refuge waterways associated with this activity. Long-term adverse impacts from increased trail miles and trail use might pose another concern to refuge fisheries. Trails that have stream and river crossings will likely degrade over time with increased use and contribute to downstream sedimentation and turbidity, which has been found to be a stressor to brook trout (Sweka and Hartman 2001) and redside dace (Holm and Crossman 1986) populations that are sensitive to habitat degradation.

Anticipated impacts of bicycle use on wildlife include temporary disturbances to species using habitats on the trail or directly adjacent to the trail. Bicycle use typically only occurs from spring through fall and usually when the ground is dry. It is restricted to McLaughlin Road, thus impacting only a small area of the refuge. Only a relatively small number of cyclists are believed to be using the road, although on occasional nice days in fall the use may be significant. Use of the roads may cause direct impacts such as mortality (e.g., crushing amphibians) or nest abandonment of bird species nesting on trails. Long-term impacts may include certain wildlife species avoiding trail corridors as a result of this use over time.

The refuge also recognizes that large group sizes may amplify negative effects to wildlife; therefore, groups larger than 10 are required to notify the refuge prior to visiting to obtain a SUP.

We will take all appropriate measures to avoid or minimize any negative effects. We will evaluate the road periodically to prevent habitat degradation. If there is evidence of unacceptable adverse impacts on wildlife, we will limit this use as deemed appropriate. We will post and enforce refuge regulations, and establish, post, and enforce closed areas as needed. Based on the information provided above, this use is not anticipated to significantly increase wildlife habitat fragmentation or cause significant impacts on wildlife through disturbance.

Impacts on Threatened and Endangered Species:
No impacts are expected on any threatened or endangered species, whether Federal or State listed. No critical habitat has been identified in the vicinity of McLaughlin Road. There has been no indication that bicycling on this road in Sunkhaze Meadows NWR causes problems for wildlife other than minimal and temporary disturbance caused by the mere presence of humans.

Summary:
Bicyclists must either drive with bikes on car racks and park at Ash Landing, or ride for many miles on other dirt roads to get to the McLaughlin Road, so current use is light and not expected to dramatically increase. Bicycles going off-trail can cause significant soil erosion and damage to vegetation, but since bicycles will be limited to a flat road designed to support trucks, we do not expect any additional impacts of this kind to occur.

Any effects of bicycling on designated roads and trails are not considered, separately or cumulatively, to constitute significant short-term or long-term impacts. Assessment of potential future impacts was based on available information and current and anticipated level and pattern of use. The current use is viewed as an effective and justifiable method of travel that allows the public to discover, experience, and enjoy priority public uses on the refuge. Monitoring will identify any actions needed to respond to new information (adaptive management) and correct problems that may arise in the future

PUBLIC REVIEW AND COMMENT:
As part of the comprehensive conservation plan (CCP) process for Sunkhaze Meadows NWR and Carlton Pond Waterfowl Production Area, this compatibility determination was available for public review and comment for 39 days concurrent with the release of our draft CCP and environmental assessment.

DETERMINATION (check one below):
This use is compatible __X__

This use is not compatible _____

STIPULATIONS NECESSARY TO ENSURE COMPATIBILITY:

- Bicycling will be restricted to McLaughlin Road and not allowed on hiking trails or off road.

- Compliance with regulations will be achieved through education, signage and law enforcement which will result in minimizing negative impacts to refuge habitat and wildlife.

- The refuge will be open to this use during regular refuge hours, sunrise to sunset.
- If significant impacts are found, corrective actions (for example, closing the road to this use during mud season) will be taken.

JUSTIFICATION:
While bicycling is not a priority public use of the National Wildlife Refuge System (The National Wildlife Refuge System Administration Act of 1966, as amended by the National Wildlife Refuge System Improvement Act of 1997), it is an existing use at Sunkhaze Meadows NWR, with no history of significant negative impacts. The Service and the Refuge System maintain goals of providing opportunities to view wildlife. Allowing the use of McLaughlin Road for bicycling may facilitate wildlife observation. These users may take the time to learn more about the refuge and become, or already be, supporters of the Refuge System.

Allowing bicycling at Sunkhaze NWR will not materially interfere with or detract from the mission of the National Wildlife Refuge System of the purposes for which the refuge was established. As listed in the purposes section of this compatibility determination, the refuge was established and subsequently land was acquired for two main purposes. As discussed under the section on anticipated impacts above, bicycling is an historic use of Sunkhaze Meadows NWR. Because this use is restricted to McLaughlin Road, away from sensitive wetland habitats and wildlife and the current and projected levels of the use are low, we anticipate that this use will have only negligible, minor, and temporary impacts on refuge resources. Because of this, it is consistent with the wildlife and habitat aspects of the refuge's purposes, the Service policy on compatible uses, the National Wildlife Refuge System Improvement Act of 1997, and the broad management objectives of the National Wildlife Refuge System. Bicycling will not materially interfere with or detract from the endangered species aspect of the refuge's purposes, because there are no federally listed threatened or endangered species known to occur on the refuge. Therefore, no significant adverse effects from dog walking are anticipated. This activity will not materially interfere with or detract from the mission of the Refuge System because of the limited impacts to refuge resources and the opportunity to reach other users as supporters of the Refuge System.

SIGNATURE:

Refuge Manager: Beth Goettel (Signature) 8/19/2013 (Date)

CONCURRENCE:

Regional Chief: Sam B. Kahn (Signature) 9/17/2013 (Date)

MANDATORY 10 YEAR RE-EVALUATION DATE: 9/17/2023

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FWS Form 3-2319
02/06

Finding of Appropriateness of a Refuge Use

Refuge Name: Sunkhaze Meadows National Wildlife Refuge

Use: Dog walking on trails

This exhibit is not required for wildlife-dependent recreational uses, forms of take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision criteria:	YES	NO
(a) Do we have jurisdiction over the use?	X	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	X	
(c) Is the use consistent with applicable Executive orders and Department and Service policies?	X	
(d) Is the use consistent with public safety?	X	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?	X	
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	X	
(g) Is the use manageable within available budget and staff?	X	
(h) Will this be manageable in the future within existing resources?	X	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	X	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D. for description), compatible, wildlife-dependent recreation into the future?	X	

Where we do not have jurisdiction over the use ("no" to (a)), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to (b), (c), or (d)) may not be found appropriate. If the answer is "no" to any of the other questions above, we will **generally** not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes X No ___

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate: ___ **Appropriate:** X

Refuge Manager: Beth Goettel Date: 8/19/2013

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use.

If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence.

If found to be **Appropriate**, the refuge supervisor must sign concurrence:

Refuge Supervisor: Graham W. Taylor Date: 9/11/13

A compatibility determination is required before the use may be allowed.

Justification for a Finding of Appropriateness of a Refuge Use

Refuge Name: Sunkhaze Meadows National Wildlife Refuge

Use: Dog walking on trails

Narrative:
Dog walking has been authorized on Sunkhaze Meadows National Wildlife Refuge (NWR, refuge) for many years. Many people who enjoy walking on refuge trails (including the Sandy Stream and Benton Unit trails) bring their canine companions along with them. Although dogs can increase disturbance to wildlife, the refuge enforces a leash restriction to keep the dog localized and under control at all times by the pedestrian. Limiting dog walking to trails will also keep potential disturbance to a minimum. No adverse impacts have been observed in the past and current levels of this use are low and are not expected to increase substantially. Continuing to allow this use will provide the public with additional options for enjoying the great outdoors and possibly introduce new people to Sunkhaze Meadows NWR and the priority use of wildlife observation. For these reasons, we have determined that allowing dog walking on the refuge is consistent with the U.S. Fish and Wildlife Service's policy on the appropriateness of refuge uses (603 FW 1).

COMPATIBILITY DETERMINATION

USE: Dog Walking on Trails

REFUGE NAME: Sunkhaze Meadows National Wildlife Refuge

DATE ESTABLISHED: November 22, 1988

ESTABLISHING AUTHORITIES:

1. Fish and Wildlife Act of 1956 (16 U.S.C. 742a-742j; 70 Stat. 1119)

2. Refuge Recreation Act of 1962 (16 U.S.C. 460k-460k-4; 76 Stat. 653)

PURPOSE(S) FOR WHICH ESTABLISHED:

1. "... for the development, advancement, management, conservation, and protection of fish and wildlife resources ..." (16 U.S.C. 742f(a)(4)), "... for the benefit of the United States Fish and Wildlife Service, in performing it activities and services. Such acceptance may be subject to the terms of any restrictive or affirmative covenant, or condition of servitude ..." (16 U.S.C. 742f(b)(1) (Fish and Wildlife Act of 1956))

2. "... suitable for -- (1) incidental fish and wildlife-oriented recreational development, (2) the protection of natural resources, (3) the conservation of endangered species or threatened species ..." (16 U.S.C. 460k-1 (Refuge Recreation Act))

MISSION OF THE NATIONAL WILDLIFE REFUGE SYSTEM:
"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." (16 U.S.C. 668dd-668ee) (National Wildlife Refuge System Administration Act of 1966)

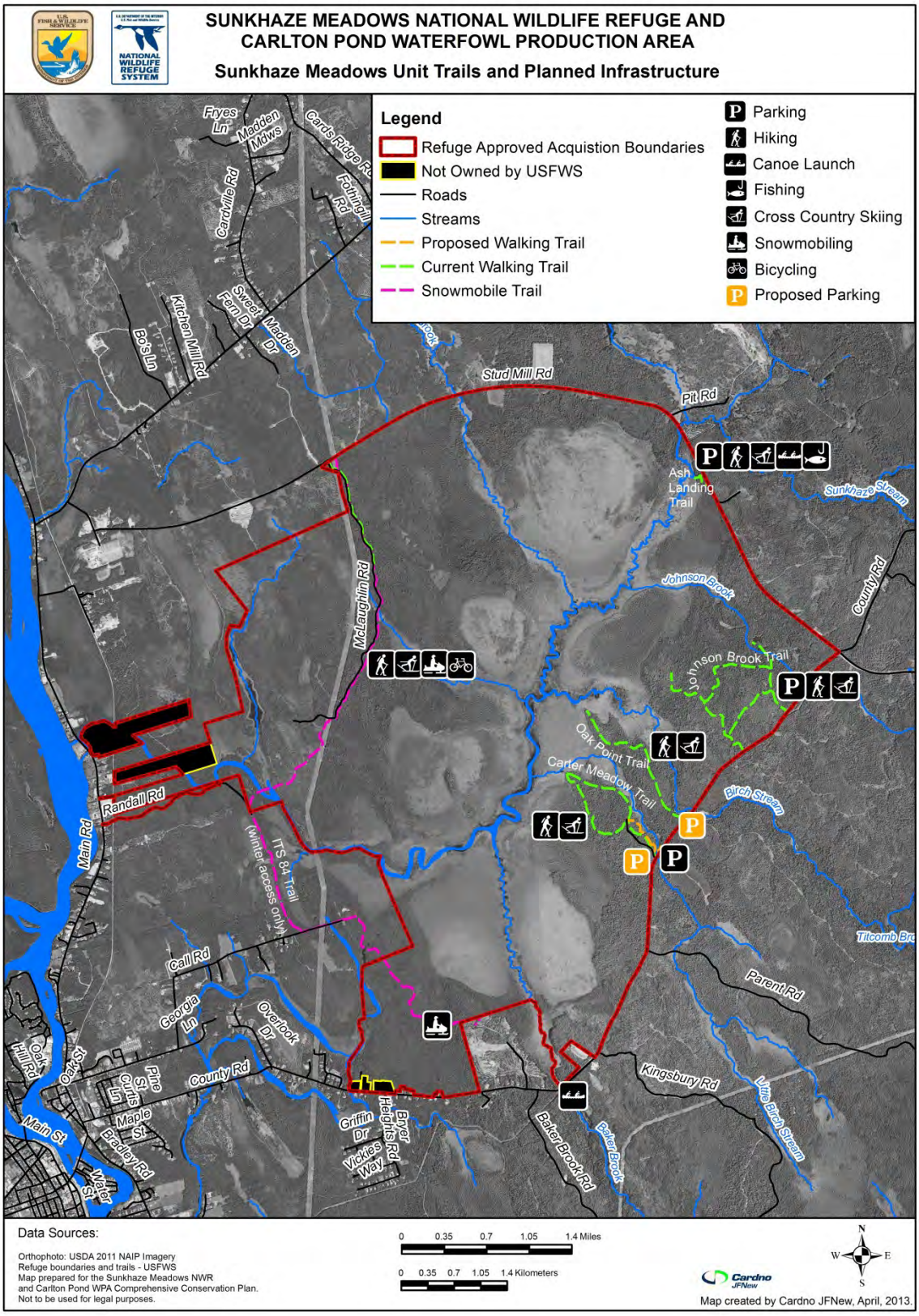
DESCRIPTION OF USE:

(a) What is the use? Is the use a priority public use?
The use is dog walking. Dog walking is not a priority public use of National Wildlife Refuge System under the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd-668ee), as amended by the National Wildlife Refuge System Improvement Act of 1997 (Public Law 105-57).

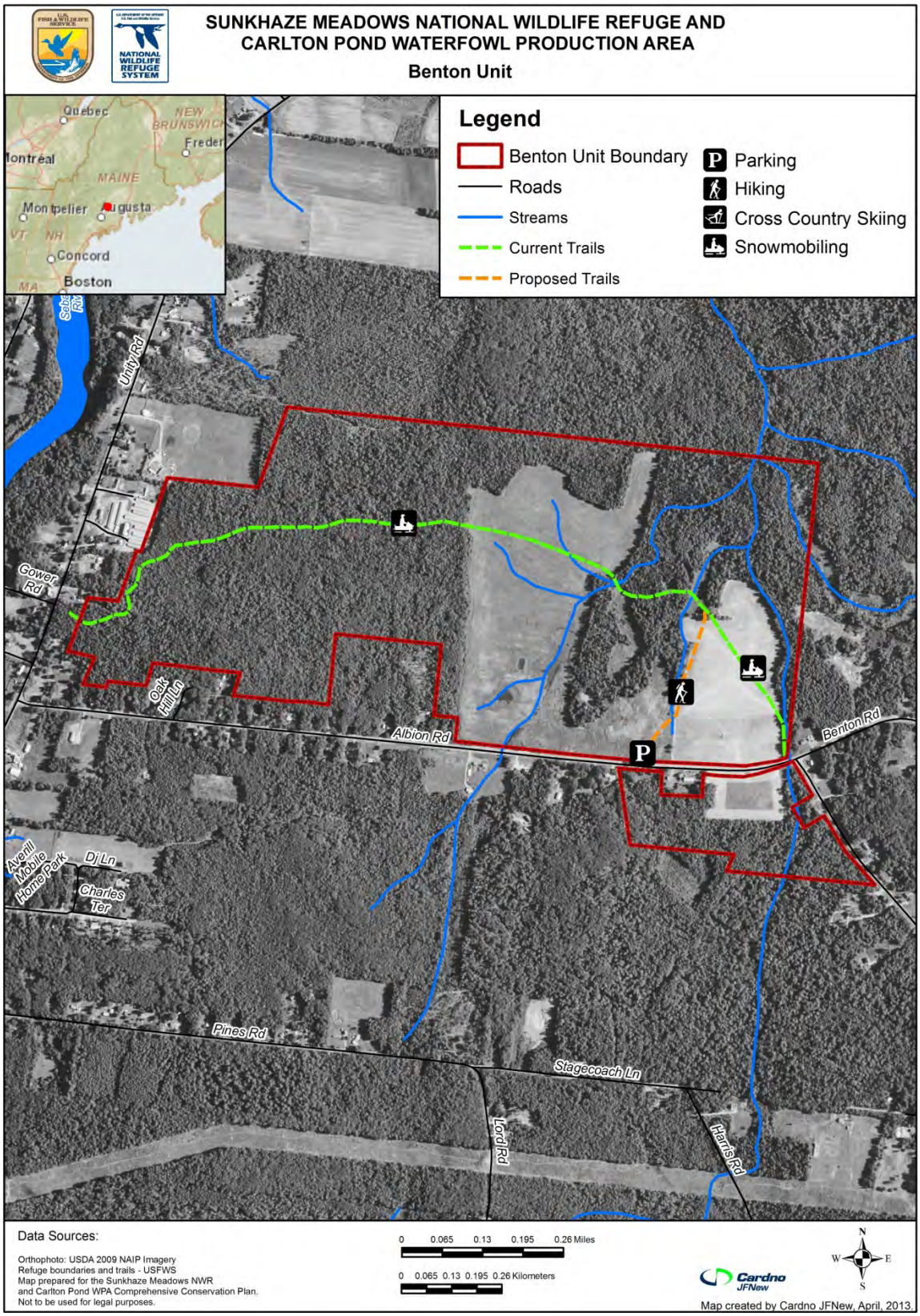
(b) Where will the use be conducted?
Dog walking will be permitted on refuge trails and McLaughlin Road at the Sunkhaze Meadows, Benton, and Sandy Stream Units.

(c) When will the use be conducted?
Dog walking will be allowed throughout the entire year, during the refuge's normal open hours. The refuge is open daily sunrise to sunset.

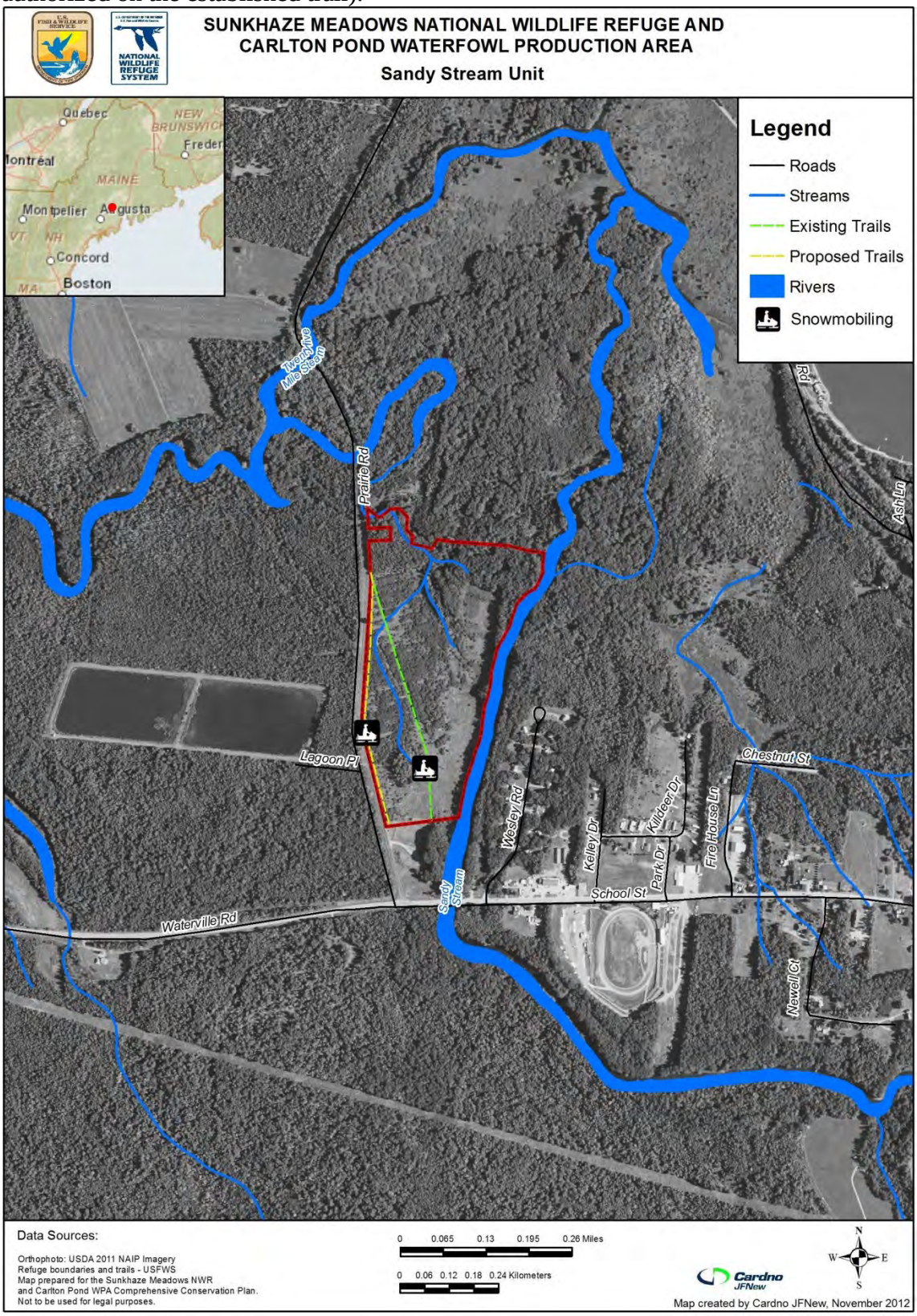
Map B.13. Roads and trails within the Sunkhaze Meadows Unit of Sunkhaze Meadows NWR (dog walking is authorized on established roads and trails).



Map B.14. Trails within the Benton Unit of Sunkhaze Meadows NWR (dog walking is authorized on established trails).



Map B.15. Trail within the Sandy Stream Unit of Sunkhaze Meadows NWR (dog walking is authorized on the established trail).



(d) How will the use be conducted?
Dog walkers will be allowed to walk their dogs only when the dog is attached to a 6-foot (or shorter) leash and the dog walker is in control of the leash and dog at all times. This leash requirement will be enforced to minimize wildlife and visitor disturbance. All dog walkers with properly leashed dogs will be restricted to refuge trails and the McLaughlin Road.

(e) Why is the use being proposed?
This is an ongoing use of the refuge, and has been occurring without any evidence that it is disruptive or causing any damage. It has been a long time tradition for residents of the local community to use these portions of the refuge for this activity building strong local support and allowing an excellent opportunity to educate dog walkers about the refuge and the National Wildlife Refuge System.

AVAILABLITY OF RESOURCES:
Except for maintaining and periodically updating existing signs explaining the regulations, minimal costs will be involved. Monitoring of the site for compliance will continue, but will not require significantly more resources beyond those already necessary to patrol the area for compliance with current regulations. Compliance with the leash law is within the regular duties of the Refuge's Law Enforcement Officer. The financial and staff resources necessary to provide and administer this use at its current level and at the level described in the final CCP are now available and we expect them to be available in the future. The annualized cost associated with the administration of pedestrian travel on the refuge is estimated below:

Providing information to the public and administration needs	$1,000
Resource impacts and monitoring	$1,000
Estimated Total:	**$2,000**

Based on a review of the budget allocated for management of this activity, funding is adequate to ensure compatibility, and to administer and manage the use listed. Our existing staff and budget have provided sufficient resources to manage this use historically.

ANTICIPATED IMPACTS OF THE USE:
The presence of dogs may flush incubating birds from nests (Yalden and Yalden 1990), disrupt breeding displays (Baydack 1986), disrupt foraging activity in shorebirds (Hoopes 1993), and disturb roosting activity in ducks (Keller 1991). Many of these authors indicated that people with dogs on a leash provoked more disturbance than people walking without a dog, and loose dogs provoked the most pronounced disturbance reactions from their study animals. The greatest stress reaction results from unanticipated disturbance. Animals show greater flight response to humans moving unpredictably than to humans following a distinct path (Gabrielsen and Smith 1995). Despite thousands of years of domestication, dogs still maintain instincts to hunt and chase. The appropriate stimulus can trigger those instincts. Dogs that are unleashed or not under the control of their owners may disturb or threaten the lives of some wildlife. In effect, off-leash dogs increase the radius of human recreational influence or disturbance beyond what it will be in the absence of a dog.

The role of dogs in wildlife diseases is poorly understood. However, dogs can host endo- and ecto-parasites, and can contract diseases from or transmit diseases to wild animals. In addition, dog waste is known to transmit diseases that may threaten the health of some wildlife and other domesticated animals. Domestic dogs potentially can introduce various diseases and transport parasites into wildlife habitats (Sime 1999).

Because the use of the trail system is relatively light, and dog walking will be restricted to public trails where disturbance may already occur due to other public use activities, the potential impacts to wildlife and their habitats are expected to be minimal. In addition, the requirement for dogs to be kept on a 6-foot leash will minimize the impacts to other users and wildlife.

We do not anticipate any impacts to water quality, soils, or vegetation other than those impacts from normal trail use as described in our wildlife observation compatibility determination. The use will be confined to existing trails and no new construction or vegetation clearing is required. Impacts on wildlife will be minimal since the trails are not close to wildlife concentration areas and the dogs will be leashed. Short-term disturbance may occur to wildlife directly adjacent to the trail.

User conflicts are unlikely to occur since trails are lightly used and dogs will be on-leash and so prevented from annoying others. Dog waste is unsightly and may carry pathogens, but these impacts may be minimized by encouraging people to pick-up their dog's waste.

Since no federally listed species occur at any of the units of Sunkhaze Meadows NWR, leashed dog walking on the trails will not cause any direct or indirect impacts to federally listed, threatened or endangered species.

PUBLIC REVIEW AND COMMENT:
As part of the comprehensive conservation plan (CCP) process for Sunkhaze Meadows NWR and Carlton Pond Waterfowl Production Area, this compatibility determination was available for public review and comment for 39 days concurrent with the release of our draft CCP and environmental assessment.

DETERMINATION (check one below):
This use is compatible __X__

This use is not compatible _____

STIPULATIONS NECESSARY TO ENSURE COMPATIBILITY:

- Only leashed dogs will be allowed on the refuge. The leash must be no more than 6 feet long. Dog walkers will be required to maintain control of their animal while on the refuge, thereby reducing the potential and severity of impacts to wildlife and must refrain from entering closed areas.

- Dog walkers must pick up after their dog(s) and remove or properly dispose of pet waste.
- Agency and public awareness will be increased through interpretive or educational materials about responsible pet ownership in the context of wildlife disturbance during all outdoor recreational pursuits.
- If a high number of reports of negative dog-wildlife or dog-people interactions on the refuge trails are reported, the refuge will reassess the use.
- If a high number of off-leash incidents are documented, we may consider eliminating dog walking from the refuge altogether.
- Restricting dog walking to the trails will reduce the potential disturbance of wildlife.

JUSTIFICATION:
Although dogs can increase disturbance to wildlife, the refuge will strictly enforce a leash law to keep dogs and disturbances localized with the pedestrian. This is an existing use at Sunkhaze Meadows NWR, with no history of significant negative impacts. There are no documented incidents of domestic dog-wildlife disturbances, nor of dog-human conflicts. The majority of dog walkers are likely local residents who regularly visit the refuge for wildlife dependent recreation and who understand our policy. The Service and the Refuge System maintain goals of providing opportunities to view wildlife. Allowing the use of the trail system by persons engaging in dog walking may facilitate wildlife observation. These users may take the time to learn more about the refuge and become, or already be, supporters of the Refuge System.

Allowing dog walking at Sunkhaze NWR will not materially interfere with, or detract from, the mission of the National Wildlife Refuge System of the purposes for which the refuge was established. As listed in the purposes section of this compatibility determination, the refuge was established and subsequently land was acquired for two main purposes. As discussed under the section on anticipated impacts above, dog walking is an historic use of Sunkhaze Meadows NWR. Because this use is restricted to McLaughlin Road and refuge trails, away from sensitive wetland habitats and wildlife, and the current levels of the use are low, we anticipate that this use will have only negligible, minor, and temporary impacts on refuge resources. Because of this, it is consistent with the wildlife and habitat aspects of the refuge's purposes, the Service policy on compatible uses, the National Wildlife Refuge System Improvement Act of 1997, and the broad management objectives of the National Wildlife Refuge System. Dog walking will not materially interfere with or detract from the endangered species aspect of the refuge's purposes, because there are no federally listed threatened or endangered species known to occur on the refuge. Therefore, no significant adverse effects from dog walking are anticipated. This activity will not materially interfere with or detract from the mission of the Refuge System, because of the limited impacts to refuge resources, because it facilitates priority public uses, and because of the stipulations specified above.

SIGNATURE:

Refuge Manager: Beth Goettel (Signature) 8/19/2013 (Date)

CONCURRENCE:

Regional Chief: Scott B. Klein (Signature) 9/17/2013 (Date)

MANDATORY 10 YEAR RE-EVALUATION DATE: 9/17/2023

BIBLIOGRAPHY

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Gabrielson, G.W., and E.N. Smith. 1995. Physiological responses of wildlife to disturbance. Pages 95-107 in R.L. Knight and K.J. Gutzwiller, ed. Wildlife and Recreationists: coexistence through management and research. Island Press, Washington, D.C. 372pp.

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Keller, V. 1991. Effects of human disturbance on eider ducklings *Somateria mollissima* in an estuarine habitat in Scotland. Biological Conservation 58:213-228.

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FWS Form 3-2319
02/06

Finding of Appropriateness of a Refuge Use

Refuge Name: Sunkhaze Meadows National Wildlife Refuge

Use: Geocaching

This exhibit is not required for wildlife-dependent recreational uses, forms of take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision criteria:	YES	NO
(a) Do we have jurisdiction over the use?	X	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	X	
(c) Is the use consistent with applicable Executive orders and Department and Service policies?	X	
(d) Is the use consistent with public safety?	X	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?	X	
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	X	
(g) Is the use manageable within available budget and staff?	X	
(h) Will this be manageable in the future within existing resources?	X	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	X	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D. for description), compatible, wildlife-dependent recreation into the future?	X	

Where we do not have jurisdiction over the use ("no" to (a)), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to (b), (c), or (d)) may not be found appropriate. If the answer is "no" to any of the other questions above, we will **generally** not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes X No ___

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate: ____ **Appropriate:** X

Refuge Manager: Beth Goettel Date: 8/19/2013

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use.

If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence.

If found to be **Appropriate**, the refuge supervisor must sign concurrence:

Refuge Supervisor: Graham W. Taylor Date: 9/11/13

A compatibility determination is required before the use may be allowed.

Justification for a Finding of Appropriateness of a Refuge Use

Refuge Name: Sunkhaze Meadows National Wildlife Refuge

Use: Geocaching

Narrative:
Traditional geocaching (by burying, placing, or removing a physical cache) is not allowed on national wildlife refuges (NWR), as digging is considered a threat to possible cultural resources and leaving items above ground is considered abandoning property. However, the Friends of Sunkhaze Meadows National Wildlife Refuge have had a non-buried cache on the refuge since 2004 and found it to be an effective tool for attracting a non-traditional audience and introducing them to the refuge. Because of the potential for this use to facilitate priority public uses, such as interpretation and environmental education, we will continue to allow caches on Sunkhaze Meadows NWR through the special use permit process. We will enhance the ability of geocaching to facilitate priority public uses by requiring caches on the refuge to offer outreach and interpretation value; the contents of caches will need to be related to the refuge or the refuge's resources in some approved way. In addition, knowing the exact location and responsible party forf each cache will enable us to know it is not abandoned property and keep track of it. It is anticipated that, given the current demand, and with these additional restrictions in place, very few additional caches will be requested. We will limit the number of geocaches if needed.

Allowed in a carefully controlled manner, geocaching is a tool to facilitate priority public uses, and to introduce a different audience to the assets of their National Wildlife Refuge System, and to encourage them to be active in the outdoors. For these reasons, we have determined that geocaching is consistent with the U.S. Fish and Wildlife Service's policy on the appropriateness of refuge uses (603 FW 1).

COMPATIBILITY DETERMINATION

USE: Geocaching

REFUGE NAME: Sunkhaze Meadows National Wildlife Refuge

DATE ESTABLISHED: November 22, 1988

ESTABLISHING AUTHORITIES:

1. Fish and Wildlife Act of 1956 (16 U.S.C. 742a-742j; 70 Stat. 1119)

2. Refuge Recreation Act of 1962 (16 U.S.C. 460k-460k-4; 76 Stat. 653)

PURPOSE(S) FOR WHICH ESTABLISHED:

1. "... for the development, advancement, management, conservation, and protection of fish and wildlife resources ..." (16 U.S.C. 742f(a)(4)), "... for the benefit of the United States Fish and Wildlife Service, in performing its activities and services. Such acceptance may be subject to the terms of any restrictive or affirmative covenant, or condition of servitude ..." (16 U.S.C. 742f(b)(1) (Fish and Wildlife Act of 1956))

2. "... suitable for -- (1) incidental fish and wildlife-oriented recreational development, (2) the protection of natural resources, (3) the conservation of endangered species or threatened species ..." (16 U.S.C. 460k-1 (Refuge Recreation Act))

MISSION OF THE NATIONAL WILDLIFE REFUGE SYSTEM:

"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." (16 U.S.C. 668dd-668ee) (National Wildlife Refuge System Administration Act of 1966)

DESCRIPTION OF USE:

(a) What is the use? Is the use a priority public use?

The use is the placement and finding of non-buried geocaches by interested participants. This use is not a priority public use of the National Wildlife Refuge System under the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd-668ee), and the National Wildlife Refuge System Improvement Act of 1997 (Public Law 105-57).

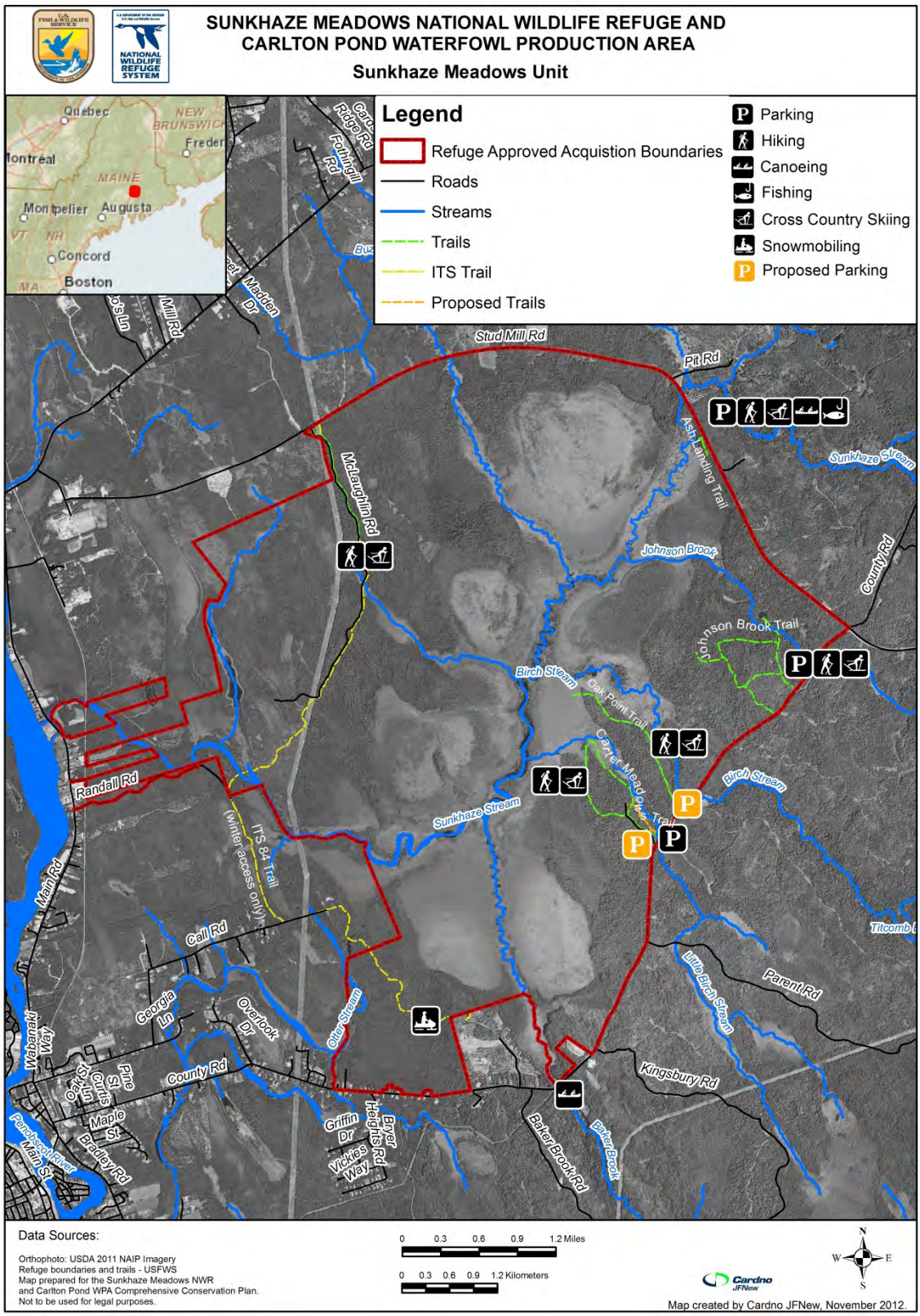
(b) Where will the use be conducted?

The location of any geocaches allowed will be at the discretion of the refuge manager on any of the refuge's units, considering factors such as ease of finding, sensitivity of surrounding flora, resilience of path to foot traffic, safety, etc.

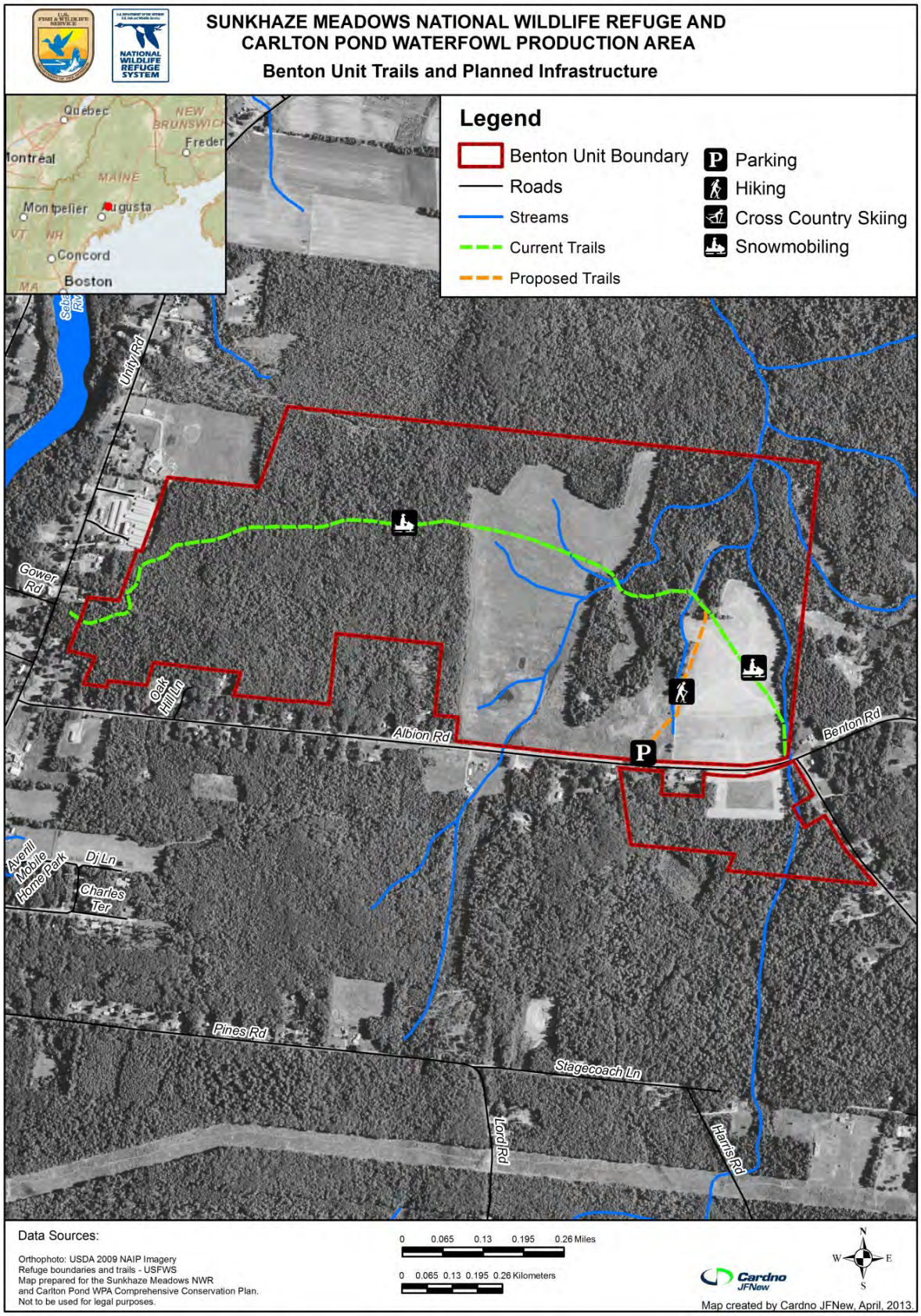
(c) When will the use be conducted?

The use will be conducted during daylight hours when the refuge is open to other public uses.

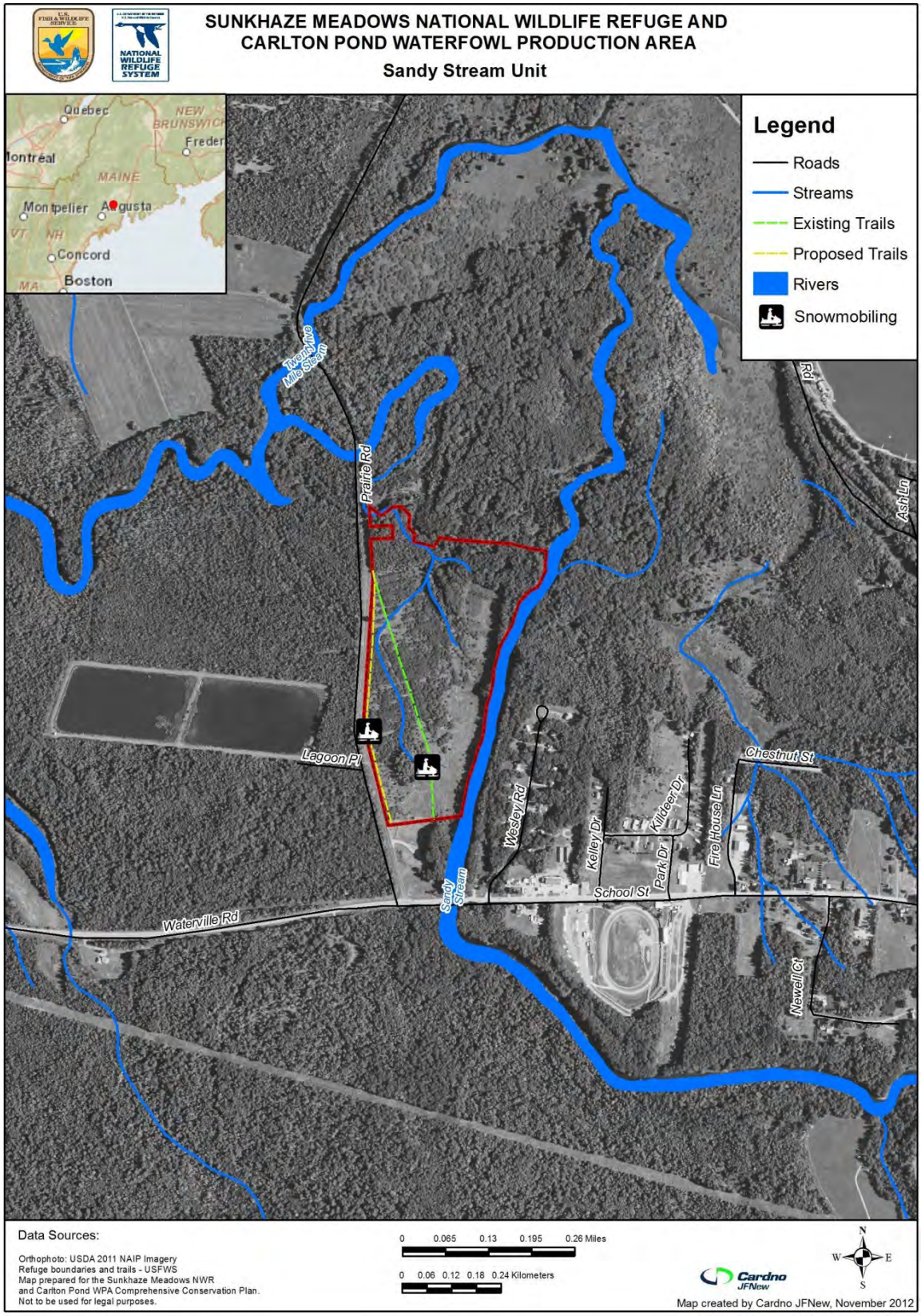
Map B.16. Current and planned facilities at the Sunkhaze Meadows Unit of Sunkhaze Meadows NWR.



Map B.17. Current and planned facilities at the Benton Unit of Sunkhaze Meadows NWR.



Map B.18. Current and planned facilities at the Sandy Stream Unit of Sunkhaze Meadows NWR.



(d) How will the use be conducted?
Traditional geocaching (by burying, placing, or removing of a physical cache) is not allowed on national wildlife refuges, as digging is considered a threat to possible cultural resources and leaving items unknown to the refuge manager above ground is considered abandoning property. In order to remove these objections, burying a geocache will not be allowed, and a special use permit (SUP) will be required for the placement and maintenance of all caches. Knowing the exact location and "ownership" of each cache will allow the refuge manager to know that the cache is not abandoned property and enable us to keep track of it. In addition, caches on the refuge need to offer outreach and interpretation value, so their contents need to be related to the refuge or the refuge's resources in some approved way. It is anticipated that, given the current demand, and with these additional restrictions in place, very few additional caches will be requested. Visitors participating in approved public uses are allowed off-trail; however, off-trail use is limited to pedestrian access only (e.g., walking, snowshoeing, skiing).

(e) Why is this use being proposed?
There is one geocache currently located on the Sunkhaze Meadows NWR. Identified as "For the Love of Peat" on the Web site (*www.goecaching.com)*, this cache was placed by a member of the Friends of Sunkhaze Meadows organization, with permission from a former refuge manager, as a method to encourage visitation to and exploration of the refuge. The Web site shows that 130 visitors have found the cache since it was placed in 2004.

This cache serves the purpose of introducing many geocache enthusiasts, potentially a new audience, to the refuge. Although alternatives to a traditional geocache have been discussed, apparently virtual geocaches do not have the same appeal to enthusiasts as the real thing. In addition, virtual geocaching and other related activities will require the input and oversight of an onsite outreach specialist; we have none as Sunkhaze NWR is currently unstaffed.

AVAILABLITY OF RESOURCES:
Annual costs associated with the administration of geocache SUPs on the refuge are estimated below:

Refuge Biologist (GS11) (review SUP applications, coordinate), 1/2 days/yr:	$168
Administrative Assistant (GS7) (SUP preparation and administration), 1 hr/yr:	$21
Total:	**$189**

The refuge now has, and is anticipated to have into the future, adequate staff and funding to manage this minor use. Staff are currently located offsite at Maine Coastal Island NWR Complex headquarters.

ANTICIPATED IMPACTS OF THE USE:
It is anticipated that any caches that are placed on the refuge will only be allowed to be placed near a parking area or trail. Since hiking, skiing, and snowshoeing are not restricted to trails, geocachers are not being allowed any special privileges. Similar to visitors participating in priority public uses, visitors searching for the cache may create damage to soft surfaces, muddy areas, and thick shrubs or other vegetation, but proper placement of the cache will mitigate these impacts in advance. Disturbance to wildlife near the trail or the off-trail routes to the cache may

increase minimally; however, history of the existing geocache at the Sunkhaze Meadows Unit suggests that just over one additional person per month visited the site over the last 8 years. The disturbance of an occasional additional visitor passing through the woods is not significant.

On the positive side, people engaged in geocaching are learning about global positioning systems, getting outdoor exercise, and observing new places. In the case of visiting a geocache at Sunkhaze Meadows NWR, they may be encountering a national wildlife refuge for the first time, and may learn about the Service and the refuge through this encounter, as well as feel more comfortable in the outdoors and see some wildlife as part of their search for the cache.

PUBLIC REVIEW AND COMMENT:
As part of the comprehensive conservation plan (CCP) process for Sunkhaze Meadows NWR and Carlton Pond Waterfowl Production Area, this compatibility determination was available for public review and comment for 39 days concurrent with the release of our draft CCP and environmental assessment.

DETERMINATION (check one below):
This use is compatible __X__

This use is not compatible _____

STIPULATIONS NECESSARY TO ENSURE COMPATIBILITY:

- All people wishing to place a cache must apply for a SUP, and work with refuge staff to find a good location that works from a caching perspective and also has very low impact to refuge resources. Caches may not be buried. The container used must be durable, waterproof, and unobtrusive.

- The cache must contain information about the refuge or its resources. The contents must be approved by the refuge staff.

JUSTIFICATION:
Traditional geocaching (by burying, placing, or removing a physical cache) is not allowed on national wildlife refuges, as digging is considered a threat to possible cultural resources and leaving items above ground is considered abandoning property. However, the Friends of Sunkhaze Meadows NWR have had a non-buried cache on the refuge since 2004 and found it to be an effective tool for attracting a non-traditional audience and introducing them to the refuge. Because of the potential for this use to facilitate priority public uses, such as interpretation and environmental education, we will allow non-buried caches on the refuge through the SUP process. We will enhance the ability of geocaching to facilitate priority public uses by requiring caches on the refuge to offer outreach and interpretation value; the contents of caches will need to be related to the refuge or the refuge's resources in some approved way. In addition, knowing the exact location and "ownership" of each cache will enable us to know it is not abandoned property and keep track of it.

Allowed in a carefully controlled manner (as stipulated above), we expect that the impacts of this use will not materially interfere with, or detract from, the mission of the National Wildlife

Refuge System or the purposes for which the refuge was established. Rather, it is a tool to introduce a different audience to the assets of their National Wildlife Refuge System, and to encourage them to be active in the outdoors.

SIGNATURE:

Refuge Manager: Beth Goettel (Signature) 8/19/2013 (Date)

CONCURRENCE:

Regional Chief: (Signature) 9/17/2013 (Date)

MANDATORY 10 YEAR RE-EVALUATION DATE: 9/17/2023

FWS Form 3-2319
02/06

Finding of Appropriateness of a Refuge Use

Refuge Name: Sunkhaze Meadows National Wildlife Refuge

Use: Commercial guiding for compatible, wildlife-dependent public uses

This exhibit is not required for wildlife-dependent recreational uses, forms of take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision criteria:	YES	NO
(a) Do we have jurisdiction over the use?	X	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	X	
(c) Is the use consistent with applicable Executive orders and Department and Service policies?	X	
(d) Is the use consistent with public safety?	X	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?	X	
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	X	
(g) Is the use manageable within available budget and staff?	X	
(h) Will this be manageable in the future within existing resources?	X	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	X	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D. for description), compatible, wildlife-dependent recreation into the future?	X	

Where we do not have jurisdiction over the use ("no" to (a)), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to (b), (c), or (d)) may not be found appropriate. If the answer is "no" to any of the other questions above, we will **generally** not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes X No ___

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate: ____ **Appropriate:** X

Refuge Manager: Beth Goettel Date: 8/19/2013

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use.

If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence.

If found to be **Appropriate**, the refuge supervisor must sign concurrence:

Refuge Supervisor: [illegible] Date: 9/11/13

A compatibility determination is required before the use may be allowed.

Justification for a Finding of Appropriateness of a Refuge Use

Refuge Name: Sunkhaze Meadows National Wildlife Refuge

Use: Commercial guiding for compatible, wildlife-dependent public uses

Narrative:
Sunkhaze Meadows National Wildlife Refuge (refuge) visitors enjoy participating in wildlife-dependent priority public uses, but many may not have the knowledge, skills, or equipment to come to the refuge and engage in these activities. Commercial guides will help facilitate a safe and high-quality priority public use experience, and facilitate observation and appreciation by participants and observers of the refuge's wildlife, habitats, and conservation programs.

By allowing this activity, refuge staff hope more visitors will be exposed to the refuge and the National Wildlife Refuge System (Refuge System), and this exposure may lead to a better understanding of the importance of the Refuge System to wildlife conservation and to the American people.

For these reasons, we have determined that commercial guiding is consistent with the U.S. Fish and Wildlife Service's policy on the appropriateness of refuge uses (603 FW 1).

COMPATIBILTY DETERMINATION

USE: Commercial Guiding for Compatible, Wildlife-dependent Public Uses

REFUGE NAME: Sunkhaze Meadows National Wildlife Refuge

ESTABLISHING AUTHORITIES:

1. Fish and Wildlife Act of 1956 (16 U.S.C. 742a-742j; 70 Stat. 1119)

2. Refuge Recreation Act of 1962 (16 U.S.C. 460k-460k-4; 76 Stat. 653)

PURPOSE(S) FOR WHICH ESTABLISHED:

1. "... for the development, advancement, management, conservation, and protection of fish and wildlife resources ..." (16 U.S.C. 742f(a)(4)), "... for the benefit of the United States Fish and Wildlife Service, in performing it activities and services. Such acceptance may be subject to the terms of any restrictive or affirmative covenant, or condition of servitude ..." (16 U.S.C. 742f(b)(1) (Fish and Wildlife Act of 1956))

2. "... suitable for -- (1) incidental fish and wildlife-oriented recreational development, (2) the protection of natural resources, (3) the conservation of endangered species or threatened species ..." ((16 U.S.C. 460k-1) (Refuge Recreation Act))

MISSION OF THE NATIONAL WILDLIFE REFUGE SYSTEM:

"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." (16 U.S.C. 668dd-668ee) (National Wildlife Refuge System Administration Act of 1966)

DESCRIPTION OF USE:

(a) What is the use? Is the use a priority use?

The use is commercially guided priority public use activities (hunting, fishing, wildlife observation, photography, environmental education, and interpretation) and select activities that have been found compatible and facilitate priority public uses (boating, skiing and snowshoeing, and orienteering). Commercial guiding is the act of accompanying or assisting any person engaged in a wildlife- or nature-dependent public use, in exchange for remuneration for those services.

To date, only a few hunting guides have inquired about obtaining special use permits (SUP), and citizens at comprehensive conservation planning scoping meetings requested that commercial guiding be allowed on Sunkhaze Meadows National Wildlife Refuge (NWR, refuge). Only wildlife- or nature-dependent activities, or those activities already found compatible are covered by this determination. Requests for any additional activities will be considered in the future on a case-by-case basis.

Commercial guiding is not a priority public use of the National Wildlife Refuge System (Refuge System) under the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd-668ee), as amended by the National Wildlife Refuge System Improvement Act of 1997. Commercial guiding can contribute to the fulfillment of refuge purposes and to the National Wildlife Refuge System Mission by facilitating priority and/or compatible public uses.

(b) Where will the use be conducted?
These activities take place on all units of the refuge that are open to individual public use. The same areas currently used by non-guided visitors for wildlife observation, wildlife photography, hunting, fishing, and environmental education will likely be used for commercially guided activities. Although the entire refuge is currently open for most activities, and overall use levels are fairly low, if user conflicts arise in the future, commercial activities could be restricted to certain areas or times to minimize such conflicts.

(c) When will the use be conducted?
These activities will take place year-round, subject to the regulations or laws governing the individual public use. Activities will take place during daylight hours only, or specified hunting hours, unless special provision is made with the refuge manager.

(d) How will the use be conducted?
Commercial guides will be allowed to operate on refuge lands through a formal process. The refuge manages commercial guiding activities at a level that is compatible with refuge purposes and that ensures high-quality guiding services are available for the public. SUP applications will be reviewed only when the complete application package has been received. If approved, permits will be mailed within 2 weeks of the request. If not approved, the entire application package (including the check) will be returned via mail. Application packages containing false statements or fraudulent or misleading information will be denied and the application fee will be forfeited.

All SUP activities are regulated by provisions listed in 50 CFR, subpart D - Permits, 15.41 - 45. The permittee will be required to comply with all Department of the Interior, U.S. Fish and Wildlife Service, and Federal, State, and local laws in the conduct of their business. Because this is an economic use of the refuge, it is also subject to other applicable laws and regulations (see 50 CFR 29.1).

The number of permittees for a particular activity is not presently limited by the refuge; however, restrictions may be placed on the quantity, time, and location of activities as deemed appropriate to sustain the resource and the quality of experience for other refuge visitors. If we determine that limits on the number of permittees is necessary, we will follow the procedures outlined in the Service's Refuge Manual (5 RM 17.11) and other applicable laws and regulations (see also 50 CFR 29.1). Whenever possible, these restrictions will be clearly explained on the permit; however, the refuge reserves the right to enforce further restrictions or to change the restrictions by amending the permit at any time during the permit period when deemed appropriate for the protection of the resource and the quality of experience for the general public. Visitors participating in approved

public uses are allowed off-trail; however, off-trail use is limited to pedestrian access only (e.g., walking, snowshoeing, skiing).

The permittee must comply with the refuge regulations and SUP conditions listed under "Stipulations Necessary to Ensure Compatibility," unless an exception is allowed in the SUP.

(e) Why is the use being proposed?
Because commercial guiding is considered an economic use, per Federal law (see 16 U.S.C. 715s) and Service regulations (50 CFR 29.1), we may only allow economic uses of a refuge natural resource where the use contributes to achieving refuge or WPA purposes or the Refuge System mission. We will allow commercial guiding to: (1) better protect refuge lands and waters; and, (2) to facilitate public participation in wildlife-dependent priority public uses, because many visitors may not have the knowledge, skills, confidence, or equipment to come to Sunkhaze Meadows NWR and engage in these activities on their own. Commercial guides will help facilitate a safe and high-quality priority public use experience, and facilitate observation and appreciation by participants and observers of the refuge's wildlife and habitats.

AVAILABILITY OF RESOURCES:
Adequate refuge personnel and base operational funds are available to manage guided experiences at existing and projected levels. Administrative staff time will primarily involve issuing and renewing SUPs each year, ensuring licenses and certifications are current, collecting client use-day fees, and reporting data on an annual basis. Fieldwork associated with administering the program primarily involves monitoring the permittees' compliance with permit terms.

Annual costs associated with the administration of commercial guiding on the refuge are estimated below:

Refuge Biologist (GS11) (review applications, coordinate with guides), 2 days/yr:	$ 672
Administrative Assistant (GS7) (SUP preparation and administration), 1 day/yr:	$ 168
Law Enforcement Officer (GS9) (checking activities for permit compliance), 5 days/yr:	$1,200
Estimated Total Cost:	**$ 2,040**

Fees will be assessed with each permit, and shall be set, when possible, to recover the costs of administering specialized uses including guiding (Refuge Manual 17.8, 17.9).

ANTICIPATED IMPACTS OF THE USE:
Commercial guiding of priority public uses and other uses that facilitate priority public uses can have positive or negative impacts to the refuge's wildlife and habitats.

The positive impacts of these uses include providing visitors with a better appreciation and more complete understanding of the wildlife and habitats associated with the refuge. This can translate into more widespread and stronger support for the refuge, the National Wildlife Refuge System, and the Service, as well as wildlife conservation in general.

The negative effects of these uses include impacts to plants, soils, hydrology, and wildlife from both visitors participating in the six priority public uses, boating, and skiing and snowshoeing on the refuge. The impacts associated with these activities are discussed in detail under the respective CDs. Below is a summary of potential impacts associated with pedestrian and boating and a discussion of additional impacts that could be associated with commercial guiding.

Vegetation Impacts:
Pedestrian travel can have indirect impacts to plants by compacting soils and diminishing soil porosity, aeration, and nutrient availability that affect plant growth and survival (Kuss 1986). Peatlands are particularly vulnerable to damage by visitors who may walk through them or collect plants. At Sunkhaze Meadows NWR, the peatlands are difficult to access due to the large area of wetlands that exist between the streams and the peat domes; there are no designated trails to access these sensitive areas. Plant collecting is also prohibited. Designated routes for pedestrian travel consist of existing trails, many with hardened surfaces or are existing trails that have been used for many years. Designated routes do not have any known occurrences of rare plant species on their surface that will be impacted by this use. Continuing pedestrian travel on these routes is not likely to cause any significant impacts to plants or plant communities.

People can be vectors for invasive plants when seeds or other propagules are moved from one area to another. The threat of invasive plant establishment will always be an issue requiring annual monitoring, and when necessary, treatment. Staff will work to educate the visiting public to reduce introductions and will also monitor and control invasive species.

Similar to the impacts to vegetation from foot travel, effects on vegetation from skiing and snowshoeing are expected to be minimal. Skiing and snowshoeing are limited to winter and require sufficient snow cover to allow access. Vegetation is largely dormant during the winter and will largely be protected by a surface layer of snow. In addition, skis and snowshoes are designed to distribute weight, decreasing the potential for compacting or eroding soils and trampling vegetation.

Boating is not expected to have adverse impacts on refuge vegetation boat access sites and trails are located away from sensitive wetlands, peatlands, and rare plants. The majority of boat use that occurs on the refuge is non-motorized through the use of canoes and kayaks. When motors are used they are either low horsepower or electric trolling motors, therefore we do not anticipate any significant effects on refuge vegetation from boaters.

Soils Impacts:
Soils can be compacted and eroded as a result of continued use of pedestrian routes (Cole and Landres 1995). It is anticipated that some soil erosion will occur as a result of continuing pedestrian access on designated routes. Under current levels of use, impacts to soils (erosion, compaction) are not likely to be significant.

Effects on soils from skiing and snowshoeing are expected to be minimal. Skiing and snowshoeing are limited to winter and require sufficient snow cover to allow access. When these activities are occurring, soils also will largely be protected by a surface layer of snow. In addition, skis and snowshoes are designed to distribute weight, decreasing potential for

compacting or eroding soils. However, given the time of year, locations, and methods used, skiing and snowshoeing are not expected to significantly affect soils on the refuge at current or projected levels of use.

The majority of boat use that occurs on the refuge is non-motorized through the use of canoes and kayaks. When motors are used they are either low horsepower or electric trolling motors, therefore we do not anticipate any significant bank erosion due to boat wakes.

Hydrologic Impacts:
Roads and trails can affect the hydrology of an area, primarily through alteration of drainage patterns. It is anticipated that existing roads and trails will continue to influence hydrology regardless of pedestrian travel. Maintenance will be required to create adequate and proper drainage to avoid hydrologic impacts. Trail construction may also cause erosion and run-off of sediment into nearby waterways from exposed soils.

Since all the units of the refuge are fairly flat, erosion is not a large problem, but impacts to wet areas can occur when bridging is inadequate and visitors widen or go off the trail to avoid wet spots. Properly sited, designed, and maintained trails minimize this impact. Based on the current level of use, pedestrian travel is not likely to significantly increase erosion, incision, or stream alteration. Therefore, no significant hydrologic impacts are anticipated from this use.

Negative impacts on water quality from motorboat and other pollutants, human waste, and litter: Extensive water quality testing on Sunkhaze Stream and its tributaries has not been carried out. The levels of pollutants from boat fuel and impacts on local aquatic systems are unknown. Hydrocarbon contamination can be harmful to fish. Currently most boating is non-motorized so we feel there is little contamination coming from this source.

Wildlife Impacts:
Disturbances vary with the wildlife species involved and the type, level, frequency, duration and the time of year such activities occur. The responses of wildlife to human activities includes: avoidance or departure from the site (Owen 1973, Burger 1981, Kaiser and Fritzell 1984, Korschen et al. 1985, Henson and Grant 1991, Kahl 1991, Klein 1993, Whittaker and Knight 1998), use of sub-optimal habitat (Erwin 1980, Williams and Forbes 1980), altered behavior or habituation to human disturbance (Burger 1981, Korschen et al. 1985, Morton et al. 1989, Ward and Stehn 1989, Havera et al. 1992, Klein 1993), attraction (Whittaker and Knight1998), and an increase in energy expenditure (Morton et al. 1989, Belanger and Bedard 1990). Knight and Cole (1991) suggest recreational activities occurring simultaneously may have a combined negative impact on wildlife. Hammitt and Cole (1998) conclude that the frequent presence of humans in wildland areas can dramatically change the normal behavior of wildlife mostly through "unintentional harassment." These responses can have negative impacts to wildlife such as mammals becoming habituated to humans making them easier targets for hunters. Human induced avoidance by wildlife can prevent animals from using otherwise suitable habitat. Seasonal sensitivities can compound the effect of disturbance on wildlife. Both bird and mammal species which are present and active during the winter have the added environmental stressors of severe weather and food shortages, and can be more negatively affected than they will from the same level of disturbance during the warmer seasons (Hammit and Cole 1998). However, many

migratory birds are not present in the winter, and most resident species are not breeding or raising young during the time of year when cross-country skiing and snowshoeing occur. Additionally, many mammal species are less active during winter months. The most commonly observed wildlife in the winter is deer, snowshoe hare, chickadees, nuthatches, and ravens.

Summary of Impacts:
Opening the refuge to commercial guiding could increase the number of visitors to the refuge and increase the number of larger groups (4 or more people) visiting the refuge. Based on observations, few known requests to commercially guide on the refuge, and knowledge of the areas involved, there is no evidence that cumulatively, commercial guiding will have a noticeable increase in adverse effects on the refuge resources. Commercial guides and their clients will be required to comply with all of the existing stipulations for authorized public uses. In addition, commercial guides will be required to comply with additional stipulations below and will be routinely checked by the refuge law enforcement officer for compliance with regulations and permit conditions. Permit conditions and stipulations noted below are designed to minimize potential impacts. Although a substantial increase in the cumulative impacts from public use is not expected in the near term, refuge staff will monitor impacts of this use and respond, if necessary, to conserve the existing high quality of refuge resources.

PUBLIC REVIEW AND COMMENT:
As part of the comprehensive conservation plan (CCP) process for Sunkhaze Meadows NWR and Carlton Pond Waterfowl Production Area, this compatibility determination was available for public review and comment for 39 days concurrent with the release of our draft CCP and environmental assessment.

DETERMINATION (check one below):
This use is compatible __X__

This use is not compatible _____

STIPULATIONS NECESSARY TO ENSURE COMPATIBILITY:
The following stipulations apply to SUPs issued for commercially guided recreational tours. Continuing law enforcement and administrative monitoring of permittees will be carried out to ensure compliance with the following conditions that are incorporated into all permits in order to minimize impacts on refuge lands and resources.

- Per Maine State law, any person who receives any form of remuneration for his/her services in accompanying or assisting any person in the fields, forests, or on the waters or ice within the boundaries of the State of Maine while hunting, fishing, trapping, boating, snowmobiling, or camping at a primitive camping area must be in possession of the appropriate, valid Guide's license issued by the State. Camping is not an authorized public use of the refuge, and is not allowed.

- The permittee will not advertise on refuge property; leaflets may not be distributed via the Refuge Visitor Center, Headquarters, etc. Leaflets may be distributed only

during approved programs covered by the SUP and only to those participants registered for that program.

- Permittee agrees to hold the U.S. Government harmless from liability for any accident/injury to their clients or employees resulting from their activities being authorized by this permit. The permittee must provide adequate and appropriate liability insurance (a Certificate of Insurance with adequate Comprehensive General Liability coverage, the minimum limit of liability being $300,000 per occurrence). The insurance certificate must name the U.S. Fish and Wildlife Service as additional insured, as well as specify that the service/activity authorized by the permit is covered by the policy and must also provide a telephone number for verification purposes.

- The permittee must provide a copy of the appropriate documentation of current Red Cross First Aid and CPR certification for all guides.

- The refuge needs public use figures for end-of-year reports (both fiscal year and calendar year); therefore, SUP use figures must be turned in to the refuge by August 1st with estimates through September 30th, and the following information must be reported: total number of trips, total number participants, and total fees.

- We reserve the right to limit the number of commercial guides and clients as needed.

- A copy of a valid SUP must be available for inspection by any law enforcement officer or refuge staff member, on request, whenever an activity authorized by the permit is occurring. Storing in the glove box of the vehicle may be acceptable; however, all guides must be knowledgeable about the permit and its conditions.

- Violation of (1) any special conditions of the SUP, (2) any stipulations in the compatibility determinations for applicable authorized public uses, or (3) any Federal, State, local, or refuge regulations may result in a Notice of Violation (NOV) being issued or revocation/cancellation of the permit without written or verbal warning. In that case, the permittee will receive immediate notification via phone with follow-up notification via mail. Permittees are responsible for the actions of their employees, agents, others working under their SUP, and their clients.

- No refund will be made to the permittee, regardless of the reason for revocation/cancellation of a permit.

- Canoe/kayak tour permits: Guides will be required to be knowledgeable in the identification and threats of aquatic invasive plant species. They will be required to inspect boats, trailers, and all associated boating equipment for the presence of plant material. All plant material must be removed and securely placed in zip lock bags prior to launching the boat or using associated equipment in refuge waters.

- For those businesses having had a previous year SUP, a current year SUP will not be issued until an accounting of tours/activities conducted under the old SUP has been received by the refuge office.

- SUPs are issued on a year-to-year basis and are not automatically re-issued on consecutive years.

- Permittee will provide all participants with relevant refuge information, including regulations and conditions of permit. The U.S. Fish and Wildlife Service will supply information to permittee, on request.

- Vehicle(s) will be used only on designated roadways and in parking areas.

- Tours must begin and end during daylight hours only unless commercially guiding for hunting where refuge hunting hours apply.

- Groups will police their clients for litter, vandalism, etc. and report any problems to the refuge office.

- Individuals guiding bird watching clients or tours may not use electronic calls without the express written permission of the refuge manager.

JUSTIFICATION:
We have determined that allowing commercial guiding at Sunkhaze Meadows NWR will not materially interfere with or detract from the mission of the National Wildlife Refuge System or the purposes for which the refuge was established. In fact, based on the analysis presented above, we have determined that allowing this use will contribute to the mission of the National Wildlife Refuge System or the purposes for which the refuge was established as follows. First, refuge visitors enjoy participating in wildlife-dependent priority public uses, but many may not have the knowledge, skills, or equipment to come to Sunkhaze Meadows NWR and engage in these activities. Commercial guides may help facilitate a safe and high-quality priority public use experience, and facilitate observation and appreciation by participants and observers of the refuge's wildlife, habitats, and conservation programs. Second, by allowing this activity, refuge staff hope more visitors will be exposed to the refuge and the Refuge System, and this exposure may lead to a better understanding of the importance of the Refuge System to wildlife conservation and to the American people. These users may take the time to learn more about the refuge and become supporters of the National Wildlife Refuge System. In addition, this use also helps fulfill goal 4 of the CCP, "Promote enjoyment and environmental stewardship by engaging visitors, students, and nearby residents to experience the wetlands, woods, and wildlife at Sunkhaze Meadows Unit."

SIGNATURE:

Refuge Manager: Beth Goettel (Signature) 8/19/2013 (Date)

CONCURRENCE:

Regional Chief: Sam B. Hu (Signature) 9/17/2013 (Date)

MANDATORY 10 YEAR RE-EVALUATION DATE: 9/17/2023

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FWS Form 3-2319
02/06

Finding of Appropriateness of a Refuge Use

Refuge Name: Sunkhaze Meadows National Wildlife Refuge

Use: Commercial haying to manage grassland habitat

This exhibit is not required for wildlife-dependent recreational uses, forms of take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision criteria:	YES	NO
(a) Do we have jurisdiction over the use?	X	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	X	
(c) Is the use consistent with applicable Executive orders and Department and Service policies?	X	
(d) Is the use consistent with public safety?	X	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?	X	
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	X	
(g) Is the use manageable within available budget and staff?	X	
(h) Will this be manageable in the future within existing resources?	X	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	X	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D. for description), compatible, wildlife-dependent recreation into the future?	X	

Where we do not have jurisdiction over the use ("no" to (a)), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to (b), (c), or (d)) may not be found appropriate. If the answer is "no" to any of the other questions above, we will **generally** not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes X No ___

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate: ____ **Appropriate:** X

Refuge Manager: Beth Goettel Date: 8/19/2013

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use.

If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence.

If found to be **Appropriate**, the refuge supervisor must sign concurrence:

Refuge Supervisor: [illegible] Date: 9/11/13

A compatibility determination is required before the use may be allowed.

Justification for a Finding of Appropriateness of a Refuge Use

Refuge Name: Sunkhaze Meadows National Wildlife Refuge

Use: Commercial haying to manage grassland habitat

Narrative:
Commercial haying at Sunkhaze Meadows National Wildlife Refuge (Sunkhaze Meadows NWR, refuge) will be permitted in designated grassland management areas of the refuge. The configuration of the areas and the number of acres managed by haying may change from year to year. We will manage between 92 and 114 acres of the Benton Unit as grassland. We will maintain about 72 acres of these grasslands through our commercial haying program.

Commercial haying is considered to be an economic use under 50 CFR 29.1. Therefore, it must contribute to the purposes for which the refuge was established or the mission of the National Wildlife Refuge System. Haying removes vegetation from the field which is otherwise left by brush hog mowing equipment. This rank cut vegetation builds a duff layer in the "understory" of the grassland which, over time, can make the grassland less suitable for target grassland-nesting bird species. Periodic removal of the vegetation from the field helps reduce dense duff layer development, and can be beneficial for nesting grassland bird species such as bobolinks and grasshopper sparrows. Unlike nearby haying on commercial farmland, haying on the refuge is conducted under a special use permit, which requires hay not to be harvested until after July 15. This allows ground-nesting, grassland-dependent birds to raise their broods and not lose their chicks to the harvesting machines. In this way, haying contributes to goal 3 of the Sunkhaze Meadows NWR and Carlton Pond Waterfowl Production Area comprehensive conservation plan (CCP), which states that the refuge will provide and promote through active management a diversity of successional habitats, including grasslands, to sustain early successional and shrubland species (USFWS 2013). Additionally, haying by a local farmer frees up staff equipment operators to conduct required management activities elsewhere on the refuge. This saves the refuge time and money which may be allocated to different projects. In that sense, this use also benefits the refuge's other natural and cultural resources.

Haying facilitates the management of refuge grassland habitat and is not only a reasonable method, but sometimes is a preferred method of cutting grasslands for nesting bird species. For these reasons, we have found commercial haying contributes to the purposes for which the refuge was established and the mission of the National Wildlife Refuge System and, therefore, is an appropriate refuge use under the U.S. Fish and Wildlife Service's policy on the appropriateness of refuge uses (603 FW 1).

Reference
U.S. Fish and Wildlife Service (USFWS). 2013. Sunkhaze Meadows National Wildlife Refuge and Carlton Pond Waterfowl Production Area Comprehensive Conservation Plan. September 2013.

COMPATIBILITY DETERMINATION

USE: Commercial Haying to Manage Grassland Habitat

REFUGE NAME: Sunkhaze Meadows National Wildlife Refuge

DATE ESTABLISHED: November 22, 1988

ESTABLISHING AUTHORITIES:

1. Fish and Wildlife Act of 1956 (16 U.S.C. 742a-742j; 70 Stat. 1119)

2. Refuge Recreation Act of 1962 (16 U.S.C. 460k-460k-4; 76 Stat. 653)

PURPOSE(S) FOR WHICH ESTABLISHED:

1. "... for the development, advancement, management, conservation, and protection of fish and wildlife resources ..." 16 U.S.C. 742f(a)(4) "... for the benefit of the United States Fish and Wildlife Service, in performing it activities and services. Such acceptance may be subject to the terms of any restrictive or affirmative covenant, or condition of servitude ..." 16 U.S.C. 742f(b)(1) (Fish and Wildlife Act of 1956)

2. "... suitable for -- (1) incidental fish and wildlife-oriented recreational development, (2) the protection of natural resources, (3) the conservation of endangered species or threatened species ..." 16 U.S.C. 460k-1 (Refuge Recreation Act)

MISSION OF THE NATIONAL WILDLIFE REFUGE SYSTEM:

"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." (16 U.S.C. 668dd-668ee) (National Wildlife Refuge System Administration Act of 1966)

DESCRIPTION OF USE:

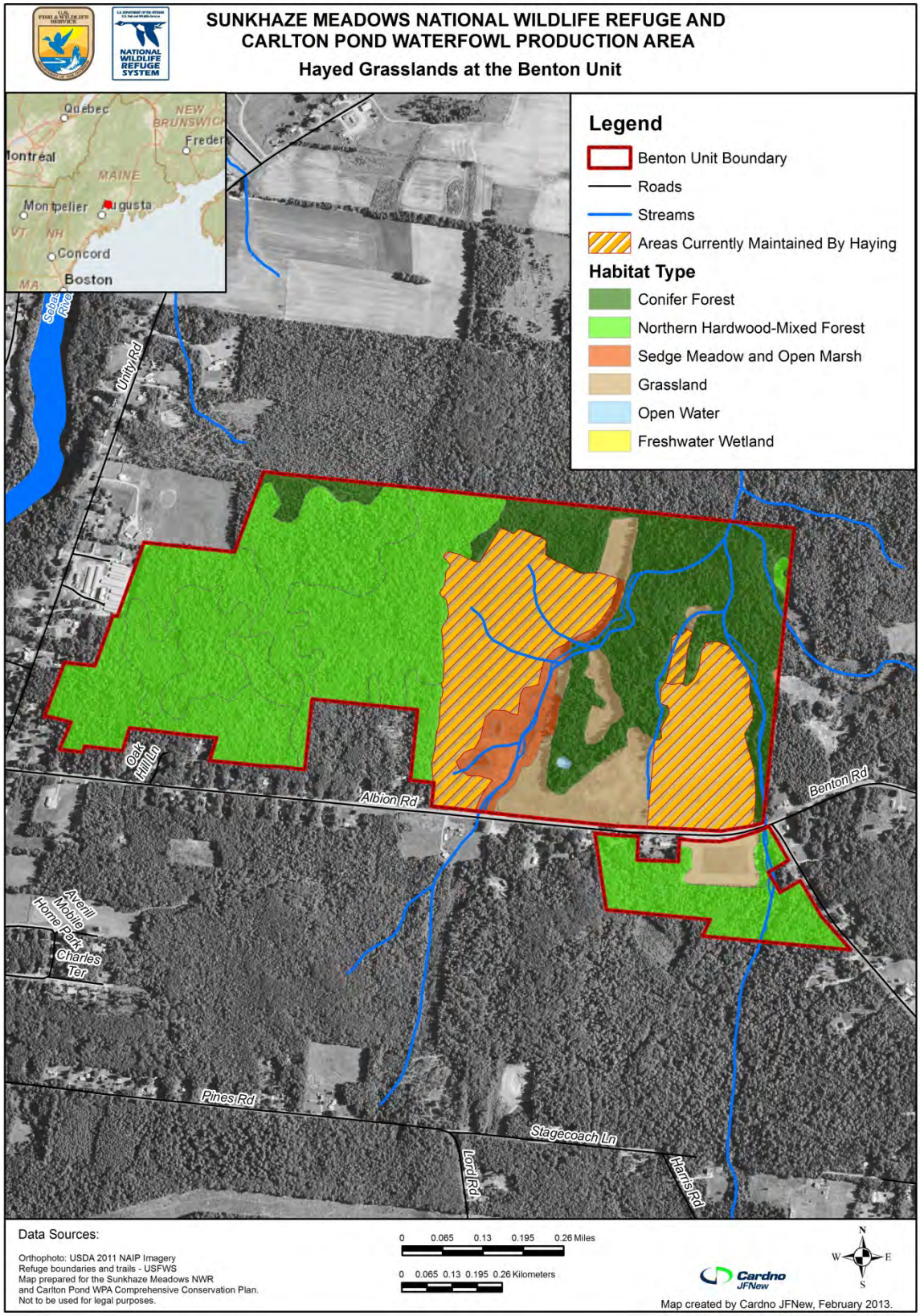
(a) What is the use? Is the use a priority public use?

The use is haying to manage grassland habitat. Haying is a refuge management economic activity, not a priority public use of the National Wildlife Refuge System under the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd-668ee), and the National Wildlife Refuge System Improvement Act of 1997 (Public Law 105-57).

(b) Where will the use be conducted?

Haying will continue on 72 acres of grass fields within the 334-acre Benton Division of the Sunkhaze Meadows National Wildlife Refuge (NWR, refuge). This represents 21 percent of the Benton Division's acreage and 0.6 percent of the total refuge acreage. A map of the acreage to be hayed during a given year will be appended to the annual special use permit which is issued for this use.

Map B.19. Grasslands managed through commercial haying at the Benton Unit of Sunkhaze Meadows NWR.



(c) When will the use be conducted?
Refuge permittees will be able to access refuge hay fields from April through October, as needed for the haying operation. Access will be for the purposes of soil testing, application of soil amendments, planting, crop monitoring, and harvesting.

The use of a tractor to spread soil amendments and for hay harvest must occur after July 15th each year, to ensure that grassland bird species have completed nesting. Harvesting and equipment removal must be completed by October 31st, which is the ending date of the annual special use permit (SUP) issued for this refuge use.

(d) How will the use be conducted?
Individuals will be authorized to cut hay via a SUP issued by the refuge manager. Refuge grasslands and open fields are currently mowed or hayed every 1 to 3 years depending on weather and field conditions, desirability of the hay by local farmers, and refuge wildlife and habitat management goals. Haying frequency and intensity will be determined by what is needed to suppress broadleaf and woody plant invasion and to develop a mosaic of grassland vegetation in fields where open grassland is desired. Acres hayed will be adjusted as needed to ensure optimum maintenance of habitat for wildlife. Residual ground cover will be allowed to grow during the fall season to provide nesting habitat for waterfowl and neo-tropical migrants the next spring.

All activities under this SUP process are regulated by provisions listed in 50 CFR, subpart D - Permits, 15.41 - 45. The permittee will be required to comply with all Department of the Interior, U.S. Fish and Wildlife Service, and Federal, State, and local laws in the conduct of their business. Because this is an economic use of the refuge, it is also subject to other applicable laws and regulations (see 50 CFR 29.1). We will continue to follow the procedures outlined in the Service's Refuge Manual (5 RM 17.11) and other applicable laws and regulations (see also 50 CFR 29.1) when selecting permittees and administering this use. To reduce costs of administering this use and consistency from year to year, we may follow procedures specified in this section of the Refuge Manual which allow a previous permittee to have priority over other applicants for renewal of any privilege so long as there has been compliance with the provisions of the previous SUP.

When the refuge haying program was established, an initial fee of $10 per acre was determined through a survey conducted by the local office of the Farm Services Agency. This survey revealed that the average farmer in the Benton, Maine area who leased land for haying paid $10 per acre. The $10 rate has been increased in subsequent years to match the annual cost-of-living increases given to the recipients of Social Security checks. Since 2007, the haying permittee has been required to pay an annual fee of $12.66 per acre.

All equipment and materials for the haying operation will be supplied by the permittee. This consists of tractors, hay wagons, soil amendments, and equipment used for spreading soil amendments. No refuge-supplied facilities or improvements are required.

Grass seed to be used will consist of species native to central Maine and may not contain any genetically modified materials, as specified by Service policy. Soil amendments may include

some portion of Class A sludge (AD plus compost), but no Class B sludge may be used. Permittee may access hay fields for soil testing, application of soil amendments, planting, monitoring, and hay harvesting, although several of these activities may only be permitted after July 15.

Administration of the haying program will be conducted in accordance with the refuge Habitat Management Plan (USFWS 2007). Haying will be subject to the terms and conditions of an annual SUP issued by the refuge manager. The terms of this permit will ensure compatibility through application and implementation of Service policy and refuge-specific stipulations.

(e) Why is this use being proposed?

Sunkhaze Meadows NWR was established to benefit migratory birds. Goal 3 of the Sunkhaze Meadows NWR and Carlton Pond WPA Comprehensive Conservation Plan (CCP) states that the refuge will provide and promote through active management a diversity of successional habitats, including grasslands, to sustain early successional and shrubland species.

We will maintain between 92 and 114 acres of grassland at the Benton Division of grassland to provide nesting and migratory habitat for landbirds of high conservation priority in PIF Area 27 such as bobolinks, sedge wrens, and American woodcock. Seventy-two acres are maintained through the commercial haying program. The remaining acres are maintained through our prescribed burning program.

Haying and mowing are useful grassland management techniques (USFWS 1982). Mitchell et al. (2000) stated that mowing is an economical means of controlling invasion of grasslands by forbs and woody plants. Further, mowing is generally a more convenient technique to apply than prescribed fire or grazing. Herkert et al. (1993) recommend rotational haying or mowing as a grassland management alternative with subunits left idle. This strategy provides a complex of grassland successional stages to meet the respective nesting requirements of several grassland bird species. More specifically, haying and mowing are recommended techniques for managing grasslands used by nesting northern harrier (Berkey et al. 1993, Dechant et al. 2001b), upland sandpiper (Kirsch and Higgins 1976, Dechant et al. 2001a), grasshopper sparrow (Dechant et al. 2001c, Vickery 1996), savannah sparrow (Swanson 2001), bobolink (Bollinger and Gavin 1992, Dechant et al. 2001d), and eastern meadowlark (Lanyon 1995, Hull 2000). All of these species use the Benton Division of Sunkhaze Meadows NWR, at least during migration.

Historically most of New England was forested, except for a period following European settlement when much of the region was cleared for agriculture and subsequently grasslands and fields became abundant. In pre-settlement times, permanent, large openings were uncommon. Scattered openings occurred along large river floodplains, around beaver flowages, in coastal heathlands and in other areas of regular disturbance. Large grasslands are now in decline and the region has reforested, perhaps back to pre-settlement proportions.

Populations of grassland birds are declining as grassland habitats and other agricultural conditions diminish. Grassland birds have declined more consistently and over a wider geographic area than any other group of North American birds over the last 30 years (Robbins et al. 1986, Askins 1993, Knopf 1995, Askins 1997, Sauer et al. 1997). As a result, most grassland

birds appear on lists of rare and declining species (NYSDEC 1997, Pashley et al. 2000, U.S. NABCI Committee 2000, USFWS 2002). Norment (2002) notes that despite the relatively recent (last 200 years) rise and fall of grassland habitats and associated birds in New England, the region may still be important for these species given their continental decline and habitat loss in the core of their ranges in the Midwest.

Large grasslands are declining across the Northeast as a result of forest succession and development. Many remaining fields are mowed twice a year (late spring and mid-summer) for hay and hence, are less suitable for nesting birds. Although there is uncertainty about the extent of grassland habitat and associated wildlife prior to European settlement, grasslands provide a component of diversity that is desired (Jones and Vickery 1997).

American woodcock, which depend on old fields and clearings for courtship displays in the spring, are declining at a rate of 2 to 3 percent per year. The major causes for these declines are thought to be loss and degradation of habitat on the breeding and wintering grounds, resulting from forest succession and land use changes (Kelley 2003). Bobolinks also rely on open field habitat for nesting and foraging and are also declining (approximately 3 percent per year) in this region.

In addition to providing breeding habitat, the fields provide important foraging habitat for spring and fall migrating birds such as the bobolink. Most migratory birds rely on seeds, fruits, and insects to sustain them through migration. While difficult to quantify, the foraging habitat provided during migration is considered a vital component of the overall habitat quality.

Grassland management requires a combination of mowing and burning to prevent natural succession to shrubland and forest. Most of the grassland bird species (e.g., grasshopper, vesper, and savannah sparrows, upland sandpiper, and eastern meadowlark) that have declined in the region require 20 acres or more of contiguous grassland habitat (Jones and Vickery 1997). Only the bobolink occupies areas less than 10 acres, although a viable population will require a larger grassland area. Small grasslands surrounded by forest or shrubland and isolated from each other are unlikely to provide quality nesting and feeding habitat for these birds (Laura Mitchell, personal communication). Without active management, refuge grasslands could quickly become dominated by nonnative invasive species including purple loosestrife, multiflora rose, reed canary grass, and Japanese knotweed.

AVAILABLITY OF RESOURCES:
This activity is a refuge management economic activity conducted for the Service by a citizen through the use of a SUP, and therefore, is not subject to the Refuge Recreation Act.

For purposes of documentation, the costs associated with this use are minimal and include the cost of preparing a permit annually, communicating habitat management goals to the permittee annually, and monitoring the activity.

Estimated costs are as follows:

Law enforcement–patrol/visitor-resource protection/ public use monitoring/enforcement/outreach:	$1,000 GS-9 Refuge Officer
Resource impacts/monitoring:	$1,000 GS-11 Wildlife Biologist
Estimated Total Cost:	**$2,000**

ANTICIPATED IMPACTS OF THE USE:

Effects on Wildlife:

Haying on the Benton Division of Sunkhaze Meadows NWR is used as an inexpensive management tool to maintain habitat for grassland-nesting birds, and for woodcock singing grounds and nocturnal roosting fields (Sepik et al. 1981) as well as providing habitat for other wildlife species such as geese, deer, and bears. At the time of refuge establishment, sedge wrens, which are a State-listed endangered species, nested on the property. Traditional habitat management activities, including haying, have been continued to ensure no significant habitat changes that could threaten use by sedge wrens. Haying has continued to make the habitat attractive to other species of importance such as bobolinks, American kestrels, and red-tailed hawks.

Haying by private parties will result in short-term disturbances and long-term benefits to both resident and migratory wildlife using the refuge. Short-term impacts will include disturbance and displacement of some wildlife by equipment operation. Haying activities will also result in short-term loss of habitat for species using those areas for nesting, feeding, or resting. This will be partially mitigated by limiting all cutting and haying until after July 15, when bobolinks, savannah sparrows and most other grassland-nesting birds have fledged at least one brood.

Other short-term impacts will be noise and exhaust fumes generated by the tractors and associated farm equipment, however this is not a significant impact. The resulting habitat will improve conditions for most of the species adversely affected by the short-term negative impacts (upland sandpiper, grasshopper sparrow, savannah sparrow and bobolink).

The American woodcock requires open areas for its spring courtship. Large fields, such as those at the Benton Division, are used by woodcock as nocturnal roosting areas during the summer months. The American woodcock is a high priority species under both the Partners in Flight and Bird Conservation Region 14 programs.

The lush re-growth that appears after a field is hayed provides green browse for Canada geese, white-tailed deer, and other wildlife.

Effects on Habitat:

Machinery and people can be vectors for invasive plants when seeds or other propagules are moved from one area to another. Once established, invasive plants can out compete native plants, thereby altering habitats and indirectly impacting wildlife. The threat of invasive plant establishment will always be an issue requiring annual monitoring, and when necessary, treatment. However, risks of introducing invasive plants via moving haying equipment from one hay field to another are thought to be minimal because there is usually no exposed mud in the

fields to get stuck in the tires and because the invasive plants that are most problematic in the area -primarily thistles- are spread via wind-blown seeds. Staff will work to eradicate any invasive species and educate the visiting public and permittee on ways to identify invasive species and methods to minimize the risk of spreading invasive species.

Overall, a controlled haying program will have long-term positive impacts to the refuge's grassland habitat. Haying suppresses invasion of grasslands by perennial forbs and shrubs. Consequently, grass-dominated plant communities are maintained. Furthermore, haying, in conjunction with a 5-year prescribed burn program for areas that are too wet or rocky for haying, will help to develop a mosaic of grassland vegetation. Diverse grasslands provide habitat for a greater diversity and abundance of grassland birds and other wildlife.

Effects on Water Quality:
The farmer is allowed to test the soil for fertility and add amendments. Over-fertilizing, fertilizing at the wrong time of year, or applying fertilizer too close to a water body can have negative impacts on water quality. Excess nitrogen and phosphorus, entering a body either overland or through the groundwater, can increase the nutrient levels in the water body. Fertilizer in a water body results in increased plant growth just as on the farm field, only in this case growth of phytoplankton, algae, and macrophytes. Dying plant material can take up a great deal of dissolved oxygen, leading to anoxic conditions and possibly to fish kills. To protect water quality on and around the refuge unit, we will impose the following stipulations as part of the SUP: 1) the permitee will be required to submit results of the soil test and plans for any amendment application to the refuge manager for approval prior to any application, and 2) permittee may not apply any soil ammendments (fertilizers) on frozen ground or within a buffer zone of 100 feet of a water body.

Socioeconomic Effects:
The haying program will also have positive economic impacts for the permittees, and will result in hay being available to local farmers and construction contractors.

PUBLIC REVIEW AND COMMENT:
As part of the comprehensive conservation plan (CCP) process for Sunkhaze Meadows NWR and Carlton Pond Waterfowl Production Area, this compatibility determination was available for public review and comment for 39 days concurrent with the release of our draft CCP and environmental assessment.

DETERMINATION (check one below):
This use is compatible __X__

This use is not compatible _____

STIPULATIONS NECESSARY TO ENSURE COMPATIBILITY:
On refuge lands:

- Refuge staff must continue to monitor the refuge for the presence of threatened or endangered species and ensure that haying continues to produce the desired habitat conditions which are beneficial to wildlife.

- Refuge permittees may access refuge hay fields from April through October, as needed for the haying operation for the purposes of soil testing, and crop monitoring. Tractor access for the application of soil amendments, planting, and harvesting, is restricted to after July 15.

- To minimize risk of spreading invasive species, haying equipment (e.g., harvesters or mowers) must be cleaned prior to entering Service lands. Cleaning entails removal of visible soil and plants or plant parts.

- The results of soil tests will be submitted to the refuge manager, along with planned rates of amendment (fertilizer) application, for review a week prior to planned application. The refuge manager reserves the right to approve or disapprove the planned application.

- No soil amendments (fertilizers) will be applied on frozen ground or within a buffer zone of 100 feet of a water body.

- Permitees must have written approval from the refuge manager before applying any pesticide (including herbicides). To provide enough time for us to complete the Service's pesticide approval process, permittees will need to submit the following to the refuge manager at least 3 months prior to the desired application date: 1) the pesticide label containing the common name of the pesticide and application rate, 2) recommended number of applications, 3) application methods and, 4) target pests. If the pesticide use is approved, the permittee is required to complete a pesticide spray record at the time of application. The pesticide spray record will be supplied by the refuge.

- Grass harvest must occur after July 15 each year, to ensure that grassland bird species have completed nesting. Harvesting and equipment removal must be completed by October 31, which is the ending date of the annual SUP issued for this refuge use.

- Haying locations may be adjusted annually or cancelled in any given year or series of years in the interest of optimizing habitat conditions for wildlife.

- Permittees must abide by the conditions stated in the annual SUP.

JUSTIFICATION:
We have determined that allowing commercial haying on Sunkhaze Meadows NWR will not materially interfere with or detract from the mission of the National Wildlife Refuge System or the purposes for which the refuge was established. In fact, based on the analysis presented above, we have determined that allowing this use will contribute to the mission of the National Wildlife Refuge System or the purposes for which the refuge was established as follows. Haying contributes to the refuge's wildlife purposes by maintaining habitat in a condition suitable for use by wildlife, primarily ground-nesting migratory birds. Raptors benefit from the area by using it extensively to hunt for small mammals. Small and large mammals use the fields for foraging and to raise their young. If equipment and staff were available, haying would be conducted by refuge

staff and therefore, not be subject to a compatibility determination. However, it is more efficient and cost effective to issue an annual SUP to harvest hay.

SIGNATURE:

Refuge Manager: Beth Goettel (Signature) 8/19/2013 (Date)

CONCURRENCE:

Regional Chief: Sam B. Ken (Signature) 9/17/2013 (Date)

MANDATORY 10 YEAR RE-EVALUATION DATE: 9/17/2023

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FWS Form 3-2319
02/06

Finding of Appropriateness of a Refuge Use

Refuge Name: Sunkhaze Meadows National Wildlife Refuge

Use: Orienteering

This exhibit is not required for wildlife-dependent recreational uses, forms of take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision criteria:	YES	NO
(a) Do we have jurisdiction over the use?	X	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	X	
(c) Is the use consistent with applicable Executive orders and Department and Service policies?	X	
(d) Is the use consistent with public safety?	X	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?	X	
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	X	
(g) Is the use manageable within available budget and staff?	X	
(h) Will this be manageable in the future within existing resources?	X	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	X	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D. for description), compatible, wildlife-dependent recreation into the future?	X	

Where we do not have jurisdiction over the use ("no" to (a)), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to (b), (c), or (d)) may not be found appropriate. If the answer is "no" to any of the other questions above, we will **generally** not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes X No ___

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate: ____ **Appropriate:** X

Refuge Manager: Beth Goettel Date: 8/19/2013

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use.

If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence.

If found to be **Appropriate**, the refuge supervisor must sign concurrence:

Refuge Supervisor: [illegible] Date: 9/11/13

A compatibility determination is required before the use may be allowed.

Justification for a Finding of Appropriateness of a Refuge Use

Refuge Name: Sunkhaze Meadows National Wildlife Refuge

Use: Orienteering

Narrative:
On occasion, small groups (20 or less), like a Boy Scout troop, may wish to use Sunkhaze Meadows National Wildlife Refuge (refuge) as an outdoor classroom to teach participants how to navigate through the woods by map and compass. We will allow this use only for educational, and not competitive, purposes under carefully regulated conditions outlined in a special use permit. This use will introduce a different audience to the assets of the National Wildlife Refuge System, encourage them to be active in the outdoors, and contribute to their understanding and appreciation for the refuge's natural resources. For these reasons, we have found this use to be consistent with the U.S. Fish and Wildlife Service's policy on the appropriateness of refuge uses (603 FW 1).

We are limiting the use to non-competitive events for several reasons. First, in standard orienteering competitions, participants must run the course in the shortest possible time. This could disturb wildlife more than walking will, and has greater potential to conflict with other compatible, priority and non-priority public uses of the refuge. To ensure the health and safety of participants, organizers will likely bring in potable water to various locations along the route (Orienteering USA 2013). This will increase potential for habitat and wildlife disturbance, particularly if large quantities of water must be transported into several locations. In addition, these water containers will be a source of litter if not disposed of properly. There are other logistical considerations involved in competitions as well including the need for a registration area, awaiting area, a finish area, and setting up and taking down checkpoints. Competitions usually include spectators as well as participants, and can include large numbers of both. All of these factors will increase potential disturbance to wildlife and habitat and conflicts with other users; therefore, we will not allow competitive orienteering events on refuge lands.

Reference:
Orienteering USA. 2013. Rules for Orienteering USA Sanctioned Events. January 1, 2013. Available online at *http://www.us.orienteering.org/sites/default/files/userfiles/u6/rules-2013-jan.pdf.*

COMPATIBILITY DETERMINATION

USE: Orienteering

REFUGE NAME: Sunkhaze Meadows National Wildlife Refuge

DATE ESTABLISHED: November 22, 1988

ESTABLISHING AUTHORITIES:

1. Fish and Wildlife Act of 1956 (16 U.S.C. 742a-742j; 70 Stat. 1119)

2. Refuge Recreation Act of 1962 (16 U.S.C. 460k-406k-4; 76 Stat. 653)

PURPOSE(S) FOR WHICH ESTABLISHED:

1. "... for the development, advancement, management, conservation, and protection of fish and wildlife resources ..." (16 U.S.C. 742f(a)(4)) "... for the benefit of the United States Fish and Wildlife Service, in performing it activities and services. Such acceptance may be subject to the terms of any restrictive or affirmative covenant, or condition of servitude ..." ((16 U.S.C. 742f(b)(1) (Fish and Wildlife Act of 1956))

2. "... suitable for -- (1) incidental fish and wildlife-oriented recreational development, (2) the protection of natural resources, (3) the conservation of endangered species or threatened species ..." ((16 U.S.C. 460k-1) (Refuge Recreation Act))

MISSION OF THE NATIONAL WILDLIFE REFUGE SYSTEM:

"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." (16 U.S.C. 668dd-668ee) (National Wildlife Refuge System Administration Act of 1966)

DESCRIPTION OF USE:

(a) What is the use? Is the use a priority public use?

The use is the teaching of map and compass skills by having participants follow a preset course from station to station across a natural area. This use is not a priority public use of the National Wildlife Refuge System under the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd-668ee), and the National Wildlife Refuge System Improvement Act of 1997 (Public Law 105-57).

(b) Where will the use be conducted?

The location of any orienteering course allowed will be at the discretion of the refuge manager, considering factors such as ease of finding, sensitivity of surrounding flora, resilience of the selected path or general area designated for use to foot traffic, safety of participants, etc. The use could occur at any of the three units of Sunkhaze Meadows NWR. It will occur on roads, trails, off-trail, or some combination of these. Visitors participating in other approved public uses are already allowed off-trail; however, off-trail use is limited to pedestrian access only (e.g., walking, snowshoeing, skiing).

(c) When will the use be conducted?
The use will be conducted during daylight hours when the refuge is open to other public uses.

(d) How will the use be conducted?
Traditional orienteering is a cross-country competition or "meet" run from point to point through natural terrain, where participants must navigate with map and compass. We are not contemplating allowing competitive meets; rather, we are intending to allow this use only to small groups of scouts or students whose leaders wish to set up a course as an educational exercise for teaching map and compass skills. We have received no requests for this activity to date, so we anticipate the number of visitors participating in this activity to be small and occasional. All aspects of the event will be controlled by a special use permit (SUP), which will only be given to competent adults who have adequate experience and safety and first aid training. Permittees will be required to remove any flags or other marking used to identify the control points promptly at the end of the event.

(e) Why is this use being proposed?
During public scoping for the refuge's comprehensive conservation plan (CCP), the Friends of Sunkhaze requested we open the refuge to this use. This use introduces individuals (including youth), potentially new audiences, to the refuge; it additionally introduces them to a healthy outdoor challenge, and map and compass skills important to budding naturalists in the State of Maine, where there are many wild lands to be explored. This use may support priority public uses at the refuge by educating visitors on skills (map and compass skills) they may find useful, particularly if they decide to explore off-trail. It also promotes safety in the outdoors by teaching skills that can prevent visitors from getting lost on the refuge and in other natural areas, particularly when going off-trail.

AVAILABLITY OF RESOURCES:
Annual costs associated with the administration of geocache SUPS on the refuge are estimated below:

Refuge biologist (GS11) (review SUP applications, coordinate) 1/2 days/yr:	$168
Administrative Assistant (GS7) (SUP preparation and administration) 1 hr/yr:	$ 21
Total:	**$189**

The refuge now has, and is anticipated to have into the future, adequate staff and funding to manage this use.

ANTICIPATED IMPACTS OF THE USE:
At current and project levels of use, we expect only negligible adverse impacts to refuge wildlife and habitats from allowing occasional orienteering. Given that we have had no requests to date, we anticipate the numbers of visitors participating in this activity and frequency of occurrence will be low, and will not add appreciably to the impacts associated with other, existing public uses of the refuge. We only expect minimal and temporary disturbance caused by the mere presence of humans. Also, we do not anticipate any impacts to federally or State-listed threatened or endangered species.

Impacts to Wildlife Species:
Disturbances from recreational activities vary with the wildlife species involved and the activity's type, level, frequency, duration, and the time of year it occurs. The responses of wildlife to human activities include avoidance or departure from the site (Owen 1973, Burger 1981, Kaiser and Fritzell 1984, Korschen et al. 1985, Kahl 1991, Klein 1993, Whittaker and Knight 1998), the use of suboptimal habitat (Erwin 1980, Williams and Forbes 1980), altered behavior or habituation to human disturbance (Burger 1981, Korschen et al. 1985, Morton et al. 1989, Ward and Stehn 1989, Havera et al. 1992, Klein 1993, Whittaker and Knight 1998), attraction (Whittaker and Knight1998), and an increase in energy expenditure (Morton et al. 1989, Belanger and Bedard 1990).

Visitors to the refuge engaged in orienteering will generally be walking or running along refuge trails and roads, or in other designated areas that are also open for other public uses. The presence of people walking on refuge lands can lead to displacement of animals using these areas, although disturbance usually is a negligible influence on large mammal distributions and movements (Purdy et al. 1987; Boyle and Samson 1985). Some mammals may become habituated to humans, making them easier targets for hunters. Disturbance can have other effects including shifts in habitat use, abandonment of habitat, and increased energy demands on affected wildlife (Knight and Cole 1991).

The effects of roads and trails on animals are complex. Trail use can disturb areas outside the immediate trail corridor (Trails and Wildlife Task Force 1998, Miller et al. 2001). Bird communities in this study were apparently affected by the presence of recreational roads and trails, where common species (e.g., American robins) were found near trails and rare species (e.g., grasshopper sparrows) were found farther from trails. Songbird nest failure was also greater near trails. The effects on other forms of wildlife appear to be short-term with the exception of breeding bird communities.

A study by Miller, Knight, and Miller (1998) indicates that species composition and nest predation was altered adjacent to trails in both forested and grassland habitats. It appears that species composition changes are due to the presence of humans and not the trail or roadway itself. On the other hand, nest predation does appear to be a function of the trail that allows access to mammalian nest predators. Several studies have examined the effects of recreationists on birds using shallow-water habitats adjacent to trails and roads through wildlife refuges and coastal habitats in the eastern United States (Burger 1981, Burger 1986, Klein 1993, Klein et al. 1995, Rodgers and Smith 1995, Rodgers and Smith 1997, Burger and Gochfeld 1998). Overall, the existing research clearly demonstrates that disturbances from recreation activities have at least temporary effects on the behavior and movement of birds within a habitat or localized area. Anticipated impacts of orienteering include temporary disturbances to species using habitats along trails or roads, as well as in the areas directly adjacent to trails or roads, as well as in any other area where the use is allowed. It is anticipated that any orienteering routes that are placed on the refuge will be placed near a parking area and trail, and will be temporary. Thus, disturbances are likely to be short-term and minimal due to the transient nature of the activity. It is possible, but not likely, that there may be nest abandonment of bird species nesting on, or next to, trails and other areas used for this activity if the use is too frequent during breeding season.

Long-term impacts may include certain wildlife species avoiding trail corridors and other areas should this use become too regular over time.

To reduce impacts to wildlife from this use, we will limit this use to designated trails, roads, and other areas already open to off-trail use by the public. We will limit this use to areas away from any sensitive habitats or rare natural communities and areas where rare, threatened, or endangered species are not known to occur.

Impacts to Soils and Vegetation:
The use of trails and gravel roads could lead to soil and leaf litter compaction, exposure of tree roots, direct trampling of plants, the introduction of invasive species, and changes in the plant communities up to 6 feet away from trails (Kuss 1986). Impacts of offtrail and offroad use tend to be greater than use on trails and roads. Offtrail and offroad impacts include a reduction in the density of plants near trails, soil compaction, increased erosion, and damage or killing of plants (Trails and Wildlife Taskforce 1998).

People running cross-country may create damage to soft surfaces, muddy areas, and thick shrubs or other vegetation, but this can be mitigated in advance by proper placement of the route. To limit impacts to plants and vegetation from this use, we will limit it to designated trails, roads, and other areas generally open to the public. The areas where this use will be are open to the public for other uses, not sensitive habitats or rare natural communities, or areas where rare, threatened, or endangered species occur.

The refuge will take all reasonable measures to prevent or minimize any potential negative effects to soils and plants, and will periodically evaluate the roads, trails, and other areas where visitors are allowed to orienteer to assess and prevent degradation. If evidence of unacceptable adverse impacts appears, the refuge will switch to other areas for this use, or curtail it, as deemed appropriate.

Based on the information provided above and the projected levels of use, the refuge anticipates that there will be minimal adverse impacts to soils and vegetation from occasional orienteering. With proper management, this use will not result in any greater than negligible short and will not result in any long-term impacts that will adversely affect the purposes of the refuge or the mission of the Refuge System.

On the positive side, the students engaged in orienteering are learning about maps, compasses and navigation in the outdoors, are getting outdoor exercise, and observing new places. They may be encountering a national wildlife refuge for the first time, and may learn about the Service and the refuge through this encounter, as well as feel more comfortable in the outdoors and see some wildlife as part of their experience.

PUBLIC REVIEW AND COMMENT:
As part of the comprehensive conservation plan (CCP) process for Sunkhaze Meadows NWR and Carlton Pond Waterfowl Production Area, this compatibility determination was available for public review and comment for 39 days concurrent with the release of our draft CCP and environmental assessment.

DETERMINATION (check one below):
This use is compatible __X__

This use is not compatible _____

STIPULATIONS NECESSARY TO ENSURE COMPATIBILITY:

- The orienteering event may not be competitive, and will be limited to 20 participants or less.

- All organizers wishing to set us a temporary route must apply for a SUP, and work with refuge staff to find a good location that works from an orienteering perspective, a safety perspective, and that also will not unduly impact refuge resources.

- Organizers must have suitable safety training (i.e., first aid and CPR) and a plan in place to adequately train and monitor participants so that they do not get lost or injured.

- Organizers may only use temporary flags or marks and must remove all flagging promptly after the exercise.

JUSTIFICATION:
While orienteering is not a priority public use of the National Wildlife Refuge System (The National Wildlife Refuge System Administration Act of 1966, as amended by the National Wildlife Refuge System Improvement Act of 1997), it can support priority public uses, particularly at the Sunkhaze Meadows Unit of the refuge. Allowing orienteering, as specified above, at Sunkhaze NWR will not materially interfere with or detract from the mission of the National Wildlife Refuge System of the purposes for which the refuge was established. As listed in the purposes section of this compatibility determination, the refuge was established and subsequently land was acquired for two main purposes. Because this use is expected to be low and infrequent and the refuge manager will determine the location(s) where the activity will be allowed, we anticipate that this use will have only negligible, minor, and temporary impacts on refuge resources. Because of this, it is consistent with the wildlife and habitat aspects of the refuge's purposes, the Service policy on compatible uses, the National Wildlife Refuge System Improvement Act of 1997, and the broad management objectives of the National Wildlife Refuge System. Orienteering will not materially interfere with or detract from the endangered species aspect of the refuge's purposes, because there are no federally listed threatened or endangered species known to occur on the refuge. Therefore, no significant adverse effects from orienteering are anticipated. This activity will not materially interfere with or detract from the mission of the Refuge System because of the limited impacts to refuge resources and the opportunity to reach other users as supporters of the Refuge System. In fact, it contributes to the Refuge System mission by building skills that make participants safer and more comfortable in natural settings and introducing new audiences (particularly young people) to the refuge and the National Wildlife Refuge System. These users may take the time to learn more about the refuge and may build support for the Refuge System.

SIGNATURE:

Refuge Manager: Beth Goettel (Signature) 8/19/2013 (Date)

CONCURRENCE:

Regional Chief: Sam B. Hunt (Signature) 9/17/2013 (Date)

MANDATORY 10 YEAR RE-EVALUATION DATE: 9/17/2023

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FWS Form 3-2319
02/06

Finding of Appropriateness of a Refuge Use

Refuge Name: Sunkhaze Meadows National Wildlife Refuge

Use: Cross-country skiing and snowshoeing

This exhibit is not required for wildlife-dependent recreational uses, forms of take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision criteria:	YES	NO
(a) Do we have jurisdiction over the use?	X	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	X	
(c) Is the use consistent with applicable Executive orders and Department and Service policies?	X	
(d) Is the use consistent with public safety?	X	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?	X	
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	X	
(g) Is the use manageable within available budget and staff?	X	
(h) Will this be manageable in the future within existing resources?	X	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	X	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D. for description), compatible, wildlife-dependent recreation into the future?	X	

Where we do not have jurisdiction over the use ("no" to (a)), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to (b), (c), or (d)) may not be found appropriate. If the answer is "no" to any of the other questions above, we will **generally** not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes X No ___

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate: ____ **Appropriate:** X

Refuge Manager: Beth Goettel Date: 8/19/2013

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use.

If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence.

If found to be **Appropriate**, the refuge supervisor must sign concurrence:

Refuge Supervisor: Andrew W. Taylor Date: 9/11/13

A compatibility determination is required before the use may be allowed.

Justification for a Finding of Appropriateness of a Refuge Use

Refuge Name: Sunkhaze Meadows National Wildlife Refuge

Use: Cross-country skiing and snowshoeing

Narrative:
Wildlife observation, photography, hunting, and interpretation are priority public uses as defined by the National Wildlife Refuge System Administration Act of 1966 as amended by the National Wildlife Refuge System Improvement Act of 1997 (Public Law 105-57) and are to receive enhanced consideration over other general public uses. While cross-country skiing and snowshoeing are not priority public uses, these uses facilitate the six priority public uses (hunting, fishing, wildlife observation, photography, environmental education, and interpretation) at Sunkhaze Meadows National Wildlife Refuge (refuge). The refuge is located in Maine where the ground can be covered with snow from November to April. In Maine, the traditional means of access to outdoor destinations during winter months is via skis and snowshoes. Due to the snow cover, visitor impact is minimized during winter months since the ground is not being compressed and fewer species and fewer numbers of wildlife are present. Trails are not cleared or groomed in winter, and snowshoes or skis are often necessary to access the refuge for priority public uses during the winter months. Cross-country skiing and snowshoeing are historic uses of the refuge, and are consistent with the environmental assessment prepared for the refuge's establishment (USFWS 1988, pg. 35). These uses have been allowed on the refuge since the refuge was established with no significant adverse effects observed. These uses also facilitate furbearer management by allowing trappers better access to their traps during the winter months. For these reasons, we have determined that cross-country skiing and snowshoeing are consistent with the U.S. Fish and Wildlife Service's policy on the appropriateness of refuge uses (603 FW 1).

Reference:
U.S. Fish and Wildlife Service (USFWS). 1988. Final environmental assessment: proposal to establish Sunkhaze Meadows National Wildlife Refuge, Penobscot County, Maine. U.S. Department of the Interior, U.S. Fish and Wildlife Service, Region 5, Newton Corner, Massachusetts. 56p.

COMPATIBILITY DETERMINATION

USE: Cross-country skiing and snowshoeing

REFUGE NAME: Sunkhaze Meadows National Wildlife Refuge

DATE ESTABLISHED: November 22, 1988

ESTABLISHING AUTHORITIES:

1. Fish and Wildlife Act of 1956 (16 U.S.C. 742a-742j; 70 Stat. 1119)

2. Refuge Recreation Act of 1962 (16 U.S.C. 460k-406k-4; 76 Stat. 653)

PURPOSE(S) FOR WHICH ESTABLISHED:

1. "... for the development, advancement, management, conservation, and protection of fish and wildlife resources ..." (16 U.S.C. 742f(a)(4)) "... for the benefit of the United States Fish and Wildlife Service, in performing it activities and services. Such acceptance may be subject to the terms of any restrictive or affirmative covenant, or condition of servitude ..." ((16 U.S.C. 742f(b)(1) (Fish and Wildlife Act of 1956))

2. "... suitable for -- (1) incidental fish and wildlife-oriented recreational development, (2) the protection of natural resources, (3) the conservation of endangered species or threatened species ..." ((16 U.S.C. 460k-1) (Refuge Recreation Act))

MISSION OF THE NATIONAL WILDLIFE REFUGE SYSTEM:

"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." (16 U.S.C. 668dd-668ee) (National Wildlife Refuge System Administration Act of 1966)

DESCRIPTION OF USE:

(a) What is the use? Is the use a priority public use?

The use is allowing cross-country skiing and snowshoeing on Sunkhaze Meadows National Wildlife Refuge (NWR, refuge). The use involves modified foot-travel over the surface of the snow or ice. These uses are not priority public uses; however, they facilitate wildlife observation, wildlife photography, hunting, and interpretation during winter months.

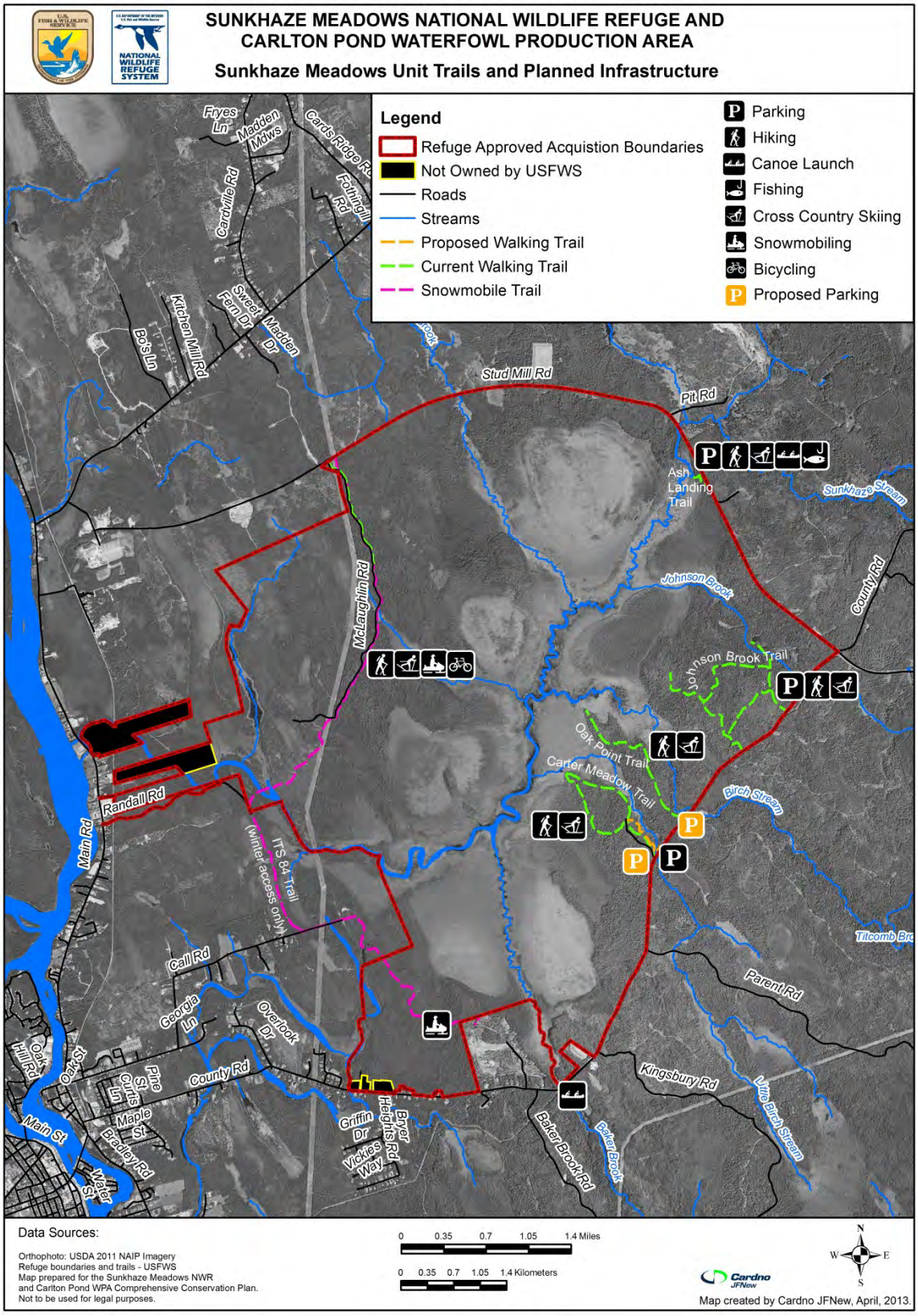
(b) Where will the use be conducted?

Most of the skiing and snowshoeing will occur along designated public use trails and access roads at the Sunkhaze Meadows Unit of the refuge where underbrush is cleared and the going is marked and relatively easy. However, a small percentage of visitors may wish to explore off-trail at any of the three refuge units.

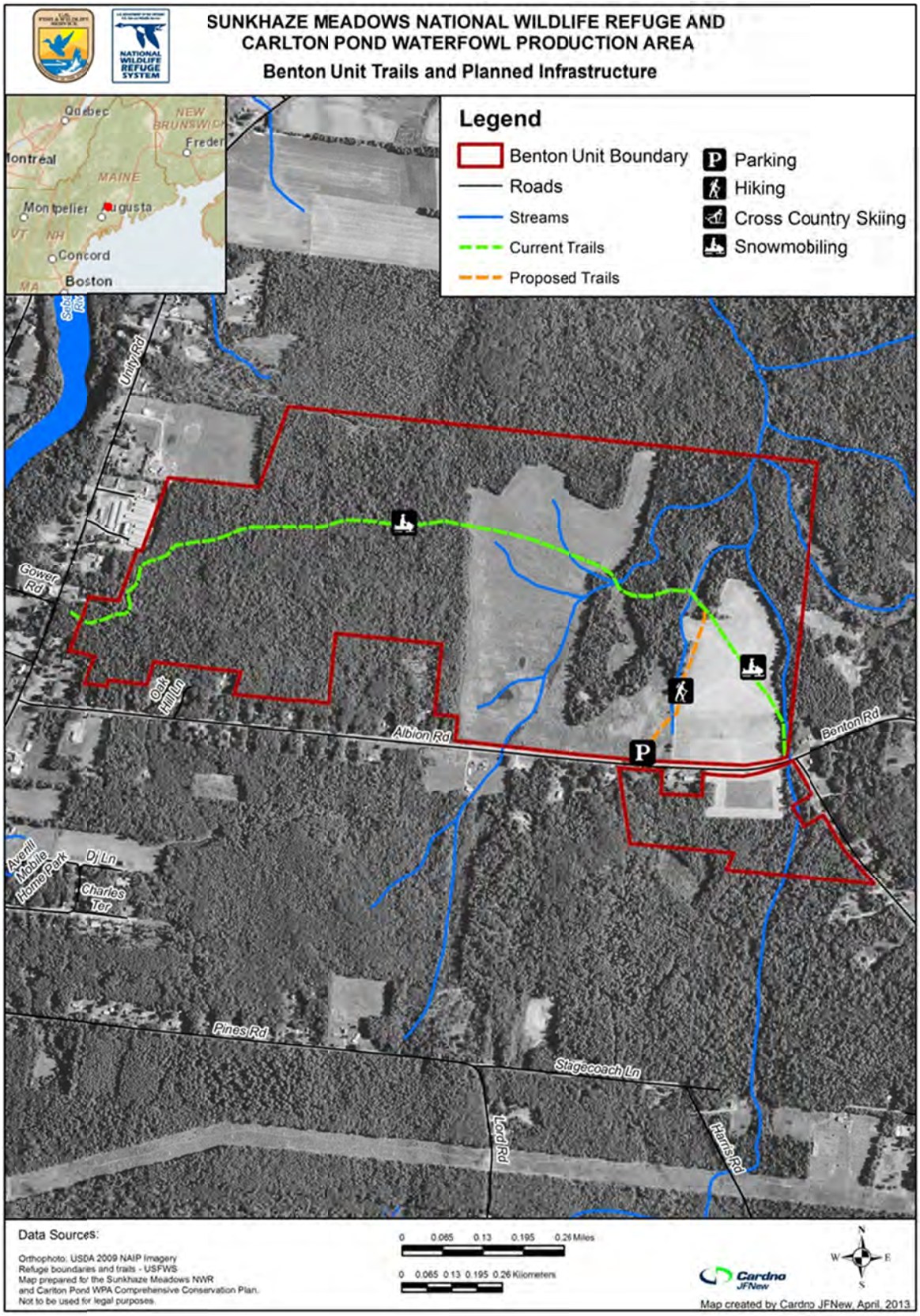
(c) When will the use be conducted?

Use will be determined by snow accumulation. Typically in central Maine, use will be limited to November through March but can vary considerably year to year. The refuge will be open to these uses from during normal refuge open hours, sunrise to sunset.

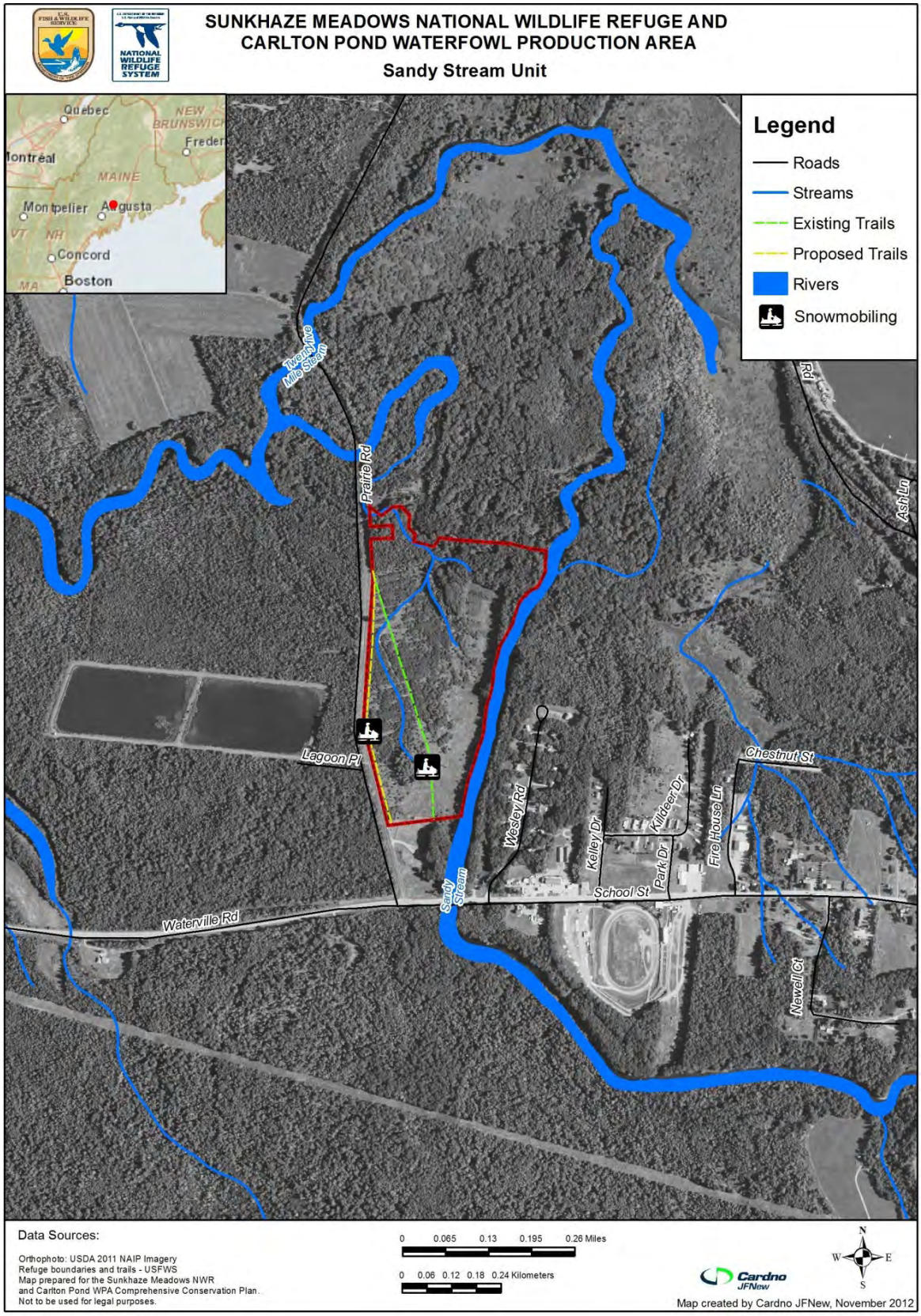
Map B.20. Current and planned facilities at the Sunkhaze Meadows Unit of Sunkhaze Meadows NWR.



Map B.21. Current and planned facilities at the Benton Unit of Sunkhaze Meadows NWR.



Map B.22**.** Current and planned facilities at the Sandy Stream Unit of Sunkhaze Meadows NWR.



(d) How will the use be conducted?
The uses are self-regulating with trail signs indicating appropriate routes of travel. The trails are not groomed. Provided staff resources are available, refuge staff will remove fallen trees and limbs. Visitors participating in these activities are allowed off-trail.

(e) Why is the use being proposed?
While skiing and snowshoeing are not priority public uses, they facilitate visitor participation in priority public uses on refuge lands during winter months. In Maine, the ground can be covered with snow from November to April. Traditional means of access to outdoor destinations during winter months is via skis and snowshoes. Due to the snow cover, visitor impact is minimized during winter months since the ground is not being compressed and fewer species and fewer numbers of wildlife are present. Trails are not cleared or groomed in winter, and snowshoes or skis are often necessary to access the refuge for priority public uses during the winter months. Cross-country skiing and snowshoeing are historic uses of the refuge, and are consistent with the environmental assessment prepared for the refuge's establishment (USFWS 1988, pg. 35). These uses have been allowed on the refuge since the refuge was established with no significant adverse effects observed. These uses also facilitate furbearer management by allowing trappers better access to their traps during the winter months.

AVAILABLITY OF RESOURCES:
The refuge has a trail system in place to support priority public uses, and these trails are already being maintained for these purposes. Allowing cross-country skiing and snowshoeing on these trails will not increase the maintenance or operational needs. Refuge staff and volunteers maintain signs designating the location of trails, but this time is minimal and can be completed with current refuge funding.

Trail maintenance:	$450
Signage and publications:	$200
Law enforcement patrol:	$800
Total:	**$1,450**

Based on a review of the budget allocated for management of this activity, funding is adequate to ensure compatibility, and to administer and manage the use listed. Our existing staff and budget have provided sufficient resources to manage this use historically.

ANTICIPATED IMPACTS OF THE USE:
No impacts are expected on any threatened or endangered species, whether federally or State listed. No critical habitat has been identified in the vicinity of any refuge trails or roads, where this use is concentrated. Allowing these areas to be used for recreational use provides users with a quality wildlife-oriented recreational experience, which is a refuge objective and is related to a goal of the National Wildlife Refuge System. There have been no indications that skiing or snowshoeing on Sunkhaze Meadows NWR causes problems for wildlife other than minimal and temporary disturbance caused by the mere presence of humans. Some impacts such as free-roaming pets, littering, and wildlife disturbance can be expected, but this is not anticipated to be significant.

In general, negative effects on habitat and wildlife associated with cross-country skiing and snowshoeing are considered minimal. Cross-country skiing and snowshoeing are limited to winter and require sufficient snow cover to allow access. Most wildlife species are less active during winter months, sensitive migratory birds have largely left the refuge. With the exception of bald eagles which start nesting in early spring (February or March), it is not breeding season for any of the wildlife that may be present. Surface water and soil may be frozen for at least a portion of this time, most vegetation is dormant, and sensitive habitat will largely be protected by a surface layer of snow. In addition, skis and snowshoes are designed to distribute weight, decreasing potential for eroding soils near waterways or soil compaction. Most visitors limit skiing and snowshoeing to established roads and trails. The following are more specific descriptions of potential impacts associated with cross-country skiing and snowshoeing.

Effects on Vegetation:
Short-term effects of trampling consist of the deterioration of plant material, whereas long-term effects of trampling include direct and indirect effects on vegetation and soils like diminishing soil porosity, aeration, and nutrient availability through soil compaction (Kuss 1986, Roovers et al. 2004). Compaction of soils limits the ability of plants, particularly rare and sensitive species, to revegetate affected areas (Hammitt and Cole 1998). Kuss (1986) found plant species adapted to wet or moist habitats are the most sensitive and increased moisture content reduces the ability of the soil to support recreational traffic.

However, overall, effects on vegetation from skiing and snowshoeing are expected to be minimal. As mentioned previously, skiing and snowshoeing are limited to winter and require sufficient snow cover to allow access. Vegetation is largely dormant during the winter and will largely be protected by a surface layer of snow. In addition, skis and snowshoes are designed to distribute weight, decreasing the potential for compacting or eroding soils and trampling vegetation. Because of difficult access, visitors that ski or snowshoe usually remain on designated roads and trails. Designated roads and trails do not have any known occurrences of rare plant species on their surface that will be impacted by these uses.

Effects on Soils:
Soils can be compacted and eroded as a result of continued use of roads and trails. Overall, effects on soils are expected to be minimal. Skiing and snowshoeing are limited to winter and require sufficient snow cover to allow access. The soil surface will likely be frozen for some of the season, making it much less vulnerable to compaction or erosion. When these activities are occurring, soils also will largely be protected by a surface layer of snow. In addition, skis and snowshoes are designed to distribute weight, decreasing potential for compacting or eroding soils. Over the long term, the risk of erosion and sedimentation problems that might affect soils in these habitats will increase with increased visitor use and trail use. However, given the time of year, locations, methods used, and minor increases expected, increased levels of skiing and snowshoeing are not expected to significantly affect soils on the refuge.

Effects on Wildlife:
Short-term and long-term adverse impacts are not expected for wildlife populations in relation to the expected low use of snowshoeing and cross country skiing. Disturbances vary by wildlife species involved and the type, level, frequency, duration and the time of year activities occur.

Beale and Monaghan (2004) found that adverse effects to wildlife increase as number of users increase. The study found that an animal's response to one visitor walking down a trail is entirely different than its response to a group of users walking down a trail. The use of trails in the winter for cross-country skiing and snowshoeing have similar wildlife disturbance effects as those which occur through pedestrian travel on these trails during the other seasons. One of the primary differences is that many migratory birds are not present, and most resident species are not breeding or raising young during the time of year when cross-country skiing and snowshoeing occur. Additionally, many mammal species are less active during winter months. The most commonly observed wildlife in the winter is deer, snowshoe hare, chickadees, nuthatches, and ravens. Both bird and mammal species which are present and active this time of year have the added environmental stressors of severe weather and food shortages and can be more negatively affected than they will from the same level of disturbance during the warmer seasons (Hammit and Cole 1998).

We will take all necessary measures to mitigate any negative effects on wildlife associated with skiing and snowshoeing. We will evaluate roads, trails, and activities periodically to assess potential negative effects. If evidence of unacceptable adverse effects is observed, we will curtail or discontinue activities as needed. We will post and enforce refuge regulations, and establish, post, and enforce closed areas as needed. However, negative effects on wildlife are expected to be minimal. As discussed previously, cross-country skiing and snowshoeing are limited to winter months and require sufficient snow levels to allow access. Additionally, many refuge trails become difficult to access during winter conditions as access to main trail heads are only minimally maintained. This greatly reduces the numbers of users accessing refuge trails for these uses and thereby, minimizes impacts.

PUBLIC REVIEW AND COMMENT:
As part of the comprehensive conservation plan (CCP) process for Sunkhaze Meadows NWR and Carlton Pond Waterfowl Production Area, this compatibility determination was available for public review and comment for 39 days concurrent with the release of our draft CCP and environmental assessment.

DETERMINATION (check one below):
This use is compatible __X__

This use is not compatible _____

STIPULATIONS NECESSARY TO ENSURE COMPATIBILITY:

- Compliance with regulations will be achieved through education, signage, and law enforcement which will result in minimizing negative impacts to refuge habitat and wildlife.

- The refuge will be open to these uses during regular refuge hours (sunrise to sunset for most uses, hours for hunting differ) and access to any restricted areas will be enforced.

JUSTIFICATION:
While cross-country skiing and snowshoeing are not a priority public uses of the National Wildlife Refuge System (The National Wildlife Refuge System Administration Act of 1966, as amended by the National Wildlife Refuge System Improvement Act of 1997), they do facilitate priority public uses at Sunkhaze Meadows NWR.

Allowing cross-country skiing and snowshoeing at Sunkhaze NWR will not materially interfere with, or detract from, the mission of the National Wildlife Refuge System of the purposes for which the refuge was established. As listed in the purposes section of this compatibility determination, the refuge was established and subsequently land was acquired for two main purposes. As discussed under the section on anticipated impacts above, cross-country skiing and snowshoeing are uses that support wildlife-dependent priority public uses with minimal adverse impacts on refuge resources. Negative effects on habitat and wildlife associated with cross-country skiing and snowshoeing are considered minimal because cross-country skiing and snowshoeing are limited to winter and require sufficient snow cover to allow access. Most wildlife species are less active during winter months, sensitive migratory birds have largely left the refuge, and it is not breeding season for any of the wildlife that may be present. Surface water and soil may be frozen for at least a portion of this time, most vegetation is dormant, and sensitive habitat will largely be protected by a surface layer of snow. This is an ongoing use of the refuge and there have been no indications that skiing or snowshoeing on Sunkhaze Meadows NWR causes problems for wildlife other than minimal and temporary disturbance caused by the mere presence of humans. Because of this, it is consistent with the wildlife and habitat aspects of the refuge's purposes, the Service policy on compatible uses, the National Wildlife Refuge System Improvement Act of 1997, and the broad management objectives of the National Wildlife Refuge System.

Cross-country skiing and snowshoeing will not materially interfere with or detract from the endangered species aspect of the refuge's purposes, because there are no federally listed threatened or endangered species known to occur on the refuge. Therefore, no significant adverse effects from these uses are anticipated. By supporting priority public uses, allowing this use supports CCP goals and objectives as described in the refuge's CCP (USFWS 2013) and the refuge's purpose associated with allowing wildlife-oriented recreational opportunities. This activity will not materially interfere with or detract from the mission of the Refuge System, because of the limited impacts to refuge resources, it facilitates priority public uses, and the opportunity to attract visitors to the refuge and build support for the Refuge System.

SIGNATURE:

Refuge Manager: Beth Goettel (Signature) 8/19/2013 (Date)

CONCURRENCE:

Regional Chief: Scott B. Kahn (Signature) 9/17/2013 (Date)

MANDATORY 10 YEAR RE-EVALUATION DATE: 9/17/2023

BIBLIOGRAPHY:

Beale, C.M. and P. Monaghan. 2004. Human disturbance: people as predation-free predators? Journal of Applied Ecology 41:335-343.

Hammitt, W.E. and D.N. Cole. 1998. Wildlife Recreation: Ecology and Management (2nd edition). New York: John Wiley & Sons. 361p.

Kuss, F.R. 1986. A review of major factors influencing plant responses to recreation impacts. Environmental Management 10:638-650.

Roovers, P., K. Verheyen, M. Hermy, and H. Gulinck. 2004. Experimental trampling and vegetation recovery in some forest and heathland communities. Applied Vegetation Science 7:111-118.

U.S. Fish and Wildlife Service (USFWS). 2013. Sunkhaze Meadows National Wildlife Refuge and Carlton Pond Waterfowl Production Area Draft Comprehensive Conservation Plan and Environmental Assessment. April 2013.

FWS Form 3-2319
02/06

Finding of Appropriateness of a Refuge Use

Refuge Name: Sunkhaze Meadows National Wildlife Refuge

Use: Snowmobiling

This exhibit is not required for wildlife-dependent recreational uses, forms of take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision criteria:	YES	NO
(a) Do we have jurisdiction over the use?	X	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	X	
(c) Is the use consistent with applicable Executive orders and Department and Service policies?	X	
(d) Is the use consistent with public safety?	X	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?	X	
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	X	
(g) Is the use manageable within available budget and staff?	X	
(h) Will this be manageable in the future within existing resources?	X	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	X	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D. for description), compatible, wildlife-dependent recreation into the future?	X	

Where we do not have jurisdiction over the use ("no" to (a)), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to (b), (c), or (d)) may not be found appropriate. If the answer is "no" to any of the other questions above, we will **generally** not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes X No ___

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate: _____ **Appropriate:** X

Refuge Manager: Beth Goettel Date: 8/19/2013

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use.

If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence.

If found to be **Appropriate**, the refuge supervisor must sign concurrence:

Refuge Supervisor: [illegible] Date: 9/11/13

A compatibility determination is required before the use may be allowed.

Justification for a Finding of Appropriateness of a Refuge Use

Refuge Name: Sunkhaze Meadows National Wildlife Refuge

Use: Snowmobiling

Narrative:
The State of Maine Interstate Trail System (ITS) is an extensive snowmobile trail network that connects Maine to neighboring states and Canada. All three of the refuge's units include a portion of a snowmobile trail. Snowmobile recreation is a critical part of the local economy during winter months and that of central Maine. The refuge is located in Maine where the ground can be covered with snow from November to April. The snowmobile trail provides a means of controlled access to the refuge in the winter months, and can provide an opportunity for visitors to engage in wildlife-dependent recreation, particularly hunting and fishing. This use may contribute to public understanding of and appreciation for the refuge's natural resources by providing opportunities for participants to experience the refuge, see refuge habitats, and support wildlife-dependent recreation during winter when visitation is usually more limited.

The original ITS-84 snowmobile trail at the Sunkhaze Meadows Unit was established before the refuge was created in 1988. The old trail traversed a portion of the refuge which included sensitive wetland habitats. After the refuge was created, the refuge manager worked with the local snowmobile club to reroute the trail, moving it away from the sensitive wetland habitats. The current 4.6-mile portion of the trail that crosses the refuge passes through forested upland. Relocation of the trail to off-refuge lands will require substantial effort and expense, and will undoubtedly result in greater impacts on wetlands than the existing trail, which impacts no wetlands in the vicinity of the refuge. Due to the snow cover, visitor impact is minimized during winter months since the ground is often frozen and fewer species and fewer numbers of wildlife are present. This is an historic use of the refuge, and is consistent with the environmental assessment prepared for the refuge's establishment (USFWS 1988, pg. 5). This use has been allowed on the refuge since the refuge was established with no significant adverse effects observed.

For these reasons, we have determined that continuing to allow this use is consistent with the U.S. Fish and Wildlife Service's policy on the appropriateness of refuge uses (603 FW 1).

Reference:
U.S. Fish and Wildlife Service (USFWS). 1988. Final Environmental Assessment: Proposal to Establish Sunkhaze Meadows National Wildlife Refuge, Penobscot County, Maine. August 1988. U.S. Department of the Interior Fish and Wildlife Service Region 5. Newton Corner, Massachusetts. 56 pp.

COMPATIBILITY DETERMINATION

USE: Snowmobiling

REFUGE NAME: Sunkhaze Meadows National Wildlife Refuge

DATE ESTABLISHED: November 22, 1988

ESTABLISHING AUTHORITIES:

1. Fish and Wildlife Act of 1956 (16 U.S.C. 742a-742j; 70 Stat. 1119)

2. Refuge Recreation Act of 1962 (16 U.S.C. 460k-406k-4; 76 Stat. 653)

PURPOSE(S) FOR WHICH ESTABLISHED:

1. "... for the development, advancement, management, conservation, and protection of fish and wildlife resources ..." (16 U.S.C. 742f(a)(4)) "... for the benefit of the United States Fish and Wildlife Service, in performing it activities and services. Such acceptance may be subject to the terms of any restrictive or affirmative covenant, or condition of servitude ..." ((16 U.S.C. 742f(b)(1) (Fish and Wildlife Act of 1956))

2. "... suitable for -- (1) incidental fish and wildlife-oriented recreational development, (2) the protection of natural resources, (3) the conservation of endangered species or threatened species ..." ((16 U.S.C. 460k-1) (Refuge Recreation Act))

MISSION OF THE NATIONAL WILDLIFE REFUGE SYSTEM:

"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." (16 U.S.C. 668dd-668ee) (National Wildlife Refuge System Administration Act of 1966)

DESCRIPTION OF USE:

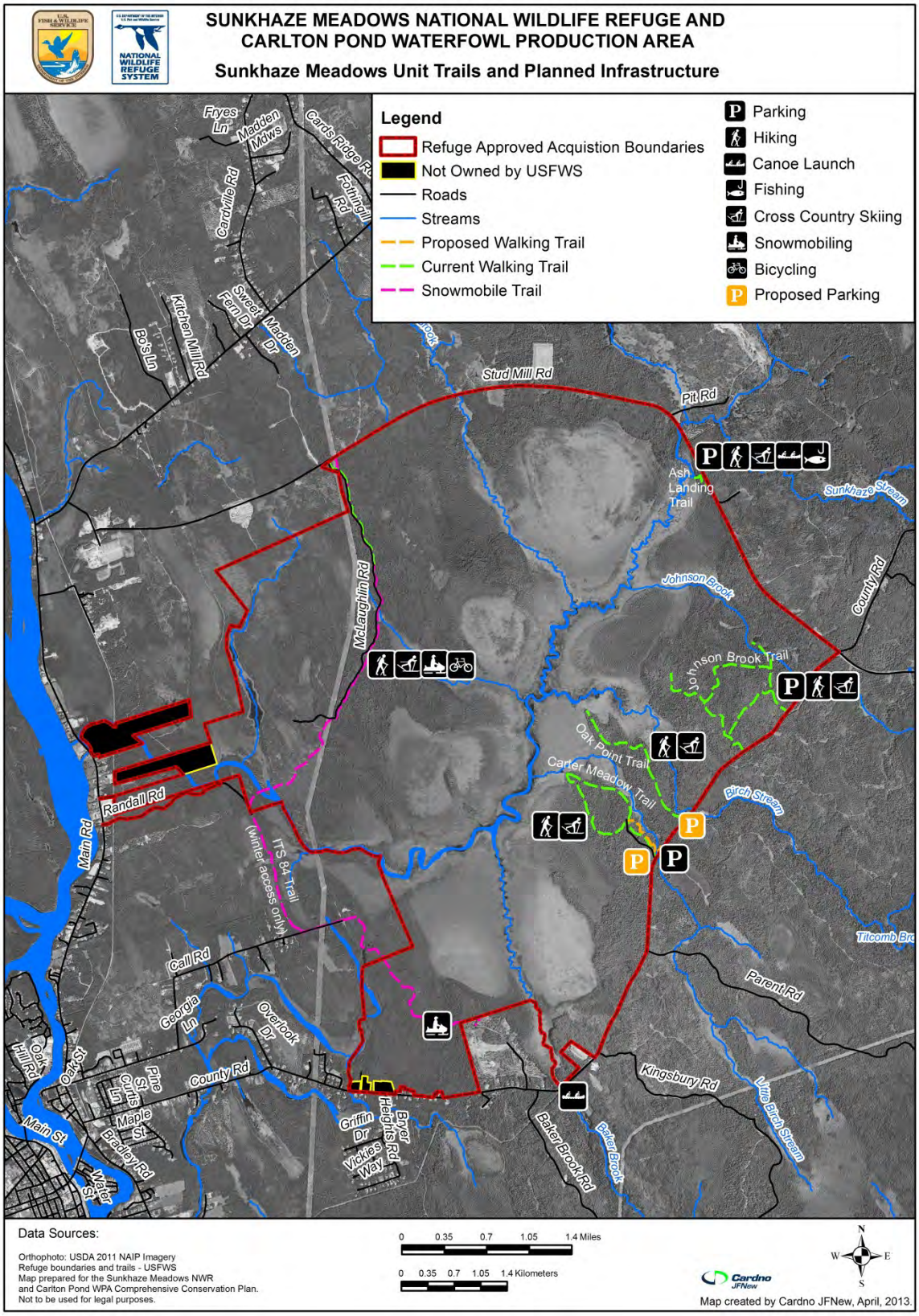
(a) What is the use? Is the use a priority public use?

The use is snowmobiling. It is not a priority public use of the National Wildlife Refuge System (Refuge System), under the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C.668dd-668ee), and the National Wildlife Refuge System Improvement Act of 1997 (Public Law 105-57).

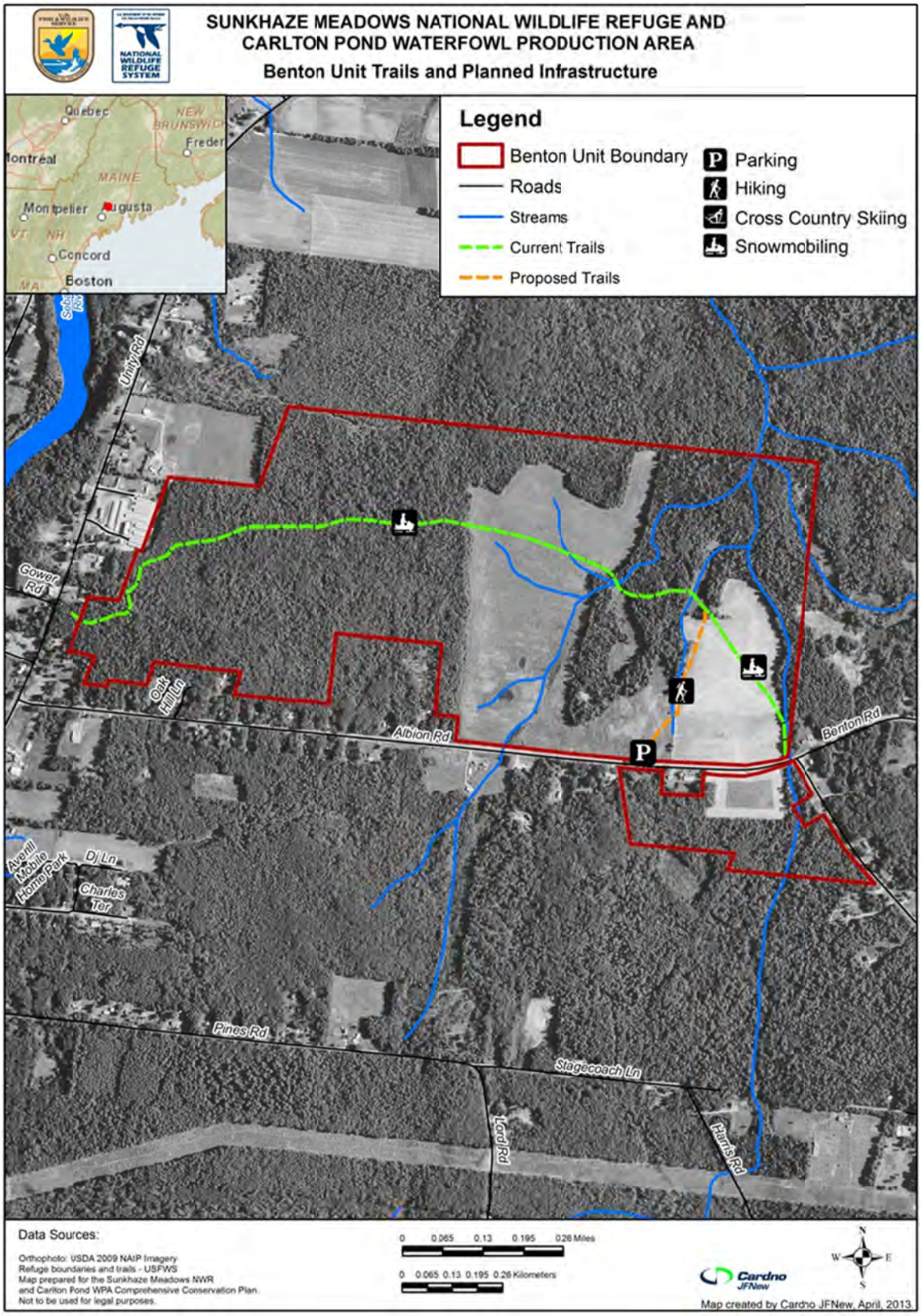
(b) Where will the use be conducted?

Snowmobile use is currently permitted on a limited portion of the Sunkhaze Meadows Unit of Sunkhaze Meadows National Wildlife Refuge (NWR, refuge) as part of the State of Maine Interstate Trail System (ITS) and on two other designated trails, one each on the Benton Unit and Sandy Stream Unit (see maps B.23, B.24, and B.25). The portion of the ITS-84 trail on Sunkhaze Meadows Unit is approximately 4.6 miles long. Trails on the Benton Unit and Sandy Stream Unit are 1.0 mile and 0.5 miles respectively.

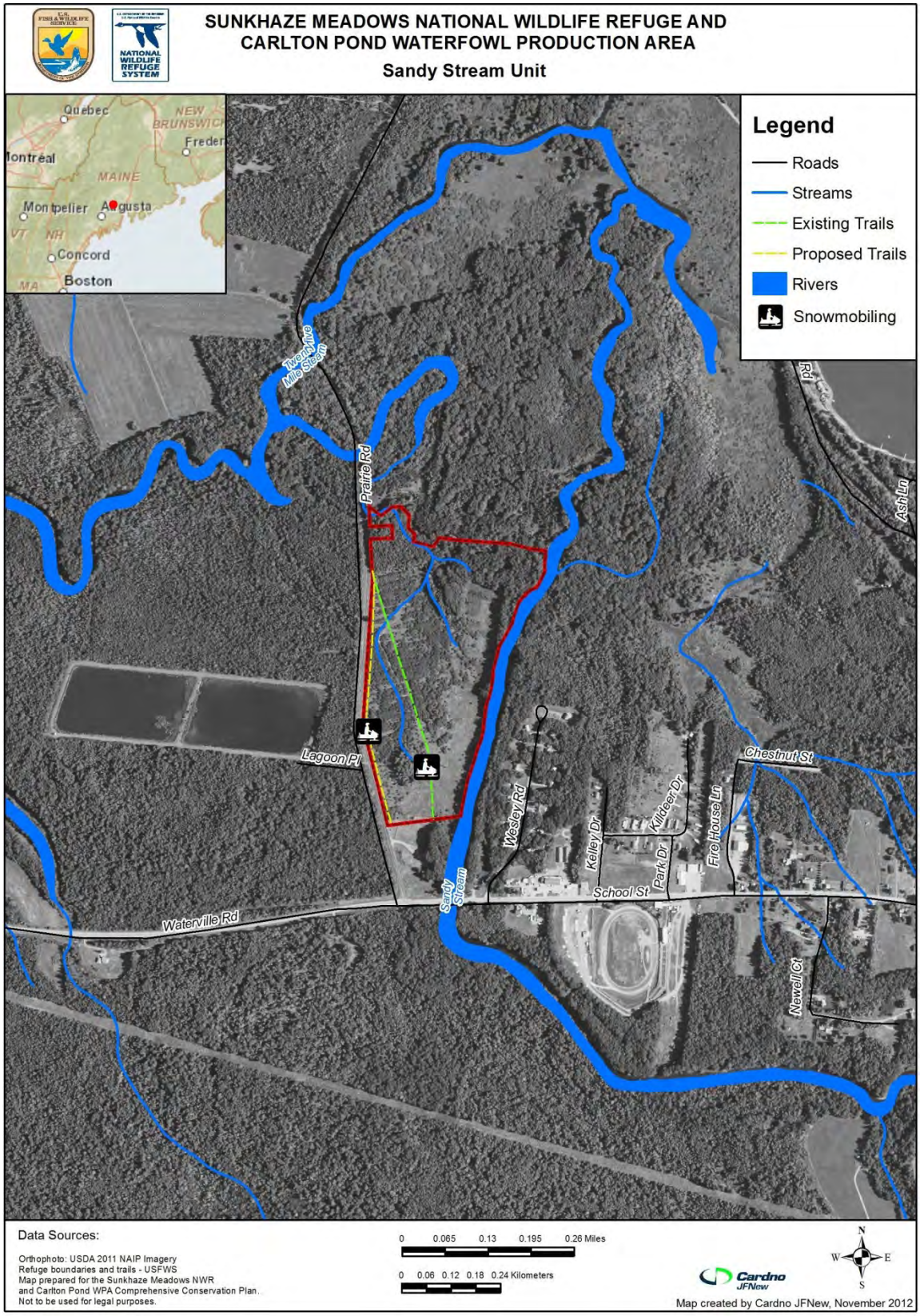
Map B.23. Snowmobile trail, and other facilities, at the Sunkhaze Meadows Unit of Sunkhaze Meadows NWR.



Map B.24. Snowmobile trail, and other facilities, at the Benton Unit of Sunkhaze Meadows NWR.



Map B.25. Snowmobile trail, and other facilities, at the Sandy Stream Unit of Sunkhaze Meadows NWR.



(c) When will the use be conducted?
Use usually occurs from January through March depending on ice and snow conditions, which vary yearly. Snowmobiling occurs when snow conditions are suitable, but no earlier than December 1 and no later than April 15.

(d) How will the use be conducted?
In Maine, snowmobile operators are required to secure landowner permission prior to traveling across lands other than their own, and snowmobile travel is permitted only on designated trails within the Statewide (ITS) trail system (unless written landowner permission is otherwise secured for off-trail operation). Throughout the ITS trail system, local snowmobile clubs are responsible for maintaining the trails within the clubs' designated areas of operation.

Snowmobile access and use on the refuge will be conducted according to applicable provisions of 50 CFR 27.31 ("General Provisions Regarding Vehicles"), applicable sections of the Maine Statutes, and Executive Orders 11644 (Use of Off-Road Vehicles on the Public Lands, February 8, 1972) and 11989 (Off-Road Vehicles on Public Lands, May 24, 1977).

The Sunkhaze Meadows Unit snowmobile trails and trail corridors are currently maintained by members of the Pine Tree Snowmobile Club of Milford, Maine and by the G and G Trailblazers Snowmobile Club of Greenbush, Maine. The Benton Unit Trail is maintained by the Country Cousins Snowmobile Club of Benton, Maine. The Sandy Stream Unit Trail is maintained by the Unity Snow Dusters Snowmobile Club of Troy, Maine.

Snowmobile clubs will continue to be required to obtain special use permits (SUP) for trail maintenance activities, including placement of appropriate signs. Members of the local clubs are responsible for placing trail junction, trail number, safety, and speed limit signs along the trails prior to December 1, maintaining them through the period of snowmobile use, and collecting signs and picking up any litter prior to the reopening of refuge roads after the mud season closure (typically prior to Memorial Day weekend). The local clubs also are responsible for grooming trails. Groomed trails typically are groomed to a width of approximately 10 to 15 feet depending on the underlying road width and snow conditions. Individual trails are groomed by permittees one to three times per week, depending on snow and trail conditions. Grooming generally occurs at night. Not all trails are regularly groomed. In late summer or fall, the clubs also maintain trails, as necessary, by cutting back woody brush that restricts trail width and removing trees that may have fallen across trails. New trail construction is not permitted.

Maximum allowed speed for snowmobiles on the refuge currently is 35 mph and is consistent with the speed limit on adjacent land ownerships. Travel is not permitted off designated trails. During the period when snowmobiles are permitted on the refuge, use occurs daily, but varies greatly in intensity. Snowmobilers typically travel in groups of two or more.

The operation of snowmobile on the refuge shall comply with all applicable State rules and regulations. We will not permit competitive snowmobiling events. No parking areas will be provided on the refuge. No all-terrain vehicles are permitted on the refuge.

Snowmobile access and use of the refuge are monitored by refuge staff and by members of the local snowmobile clubs. Additional monitoring is conducted by the local State game warden. We intend to monitor snowmobile use at the refuge via winter surveys and/or traffic counters in the future. We will also monitor the condition of culverts, bridges, pond and streams in spring and summer, and identify and close undesignated trails on the refuge.

(e) Why is this use being proposed?
Snowmobile recreation is a critical part of the local economy during winter months. The refuge is located in Maine where the ground can be covered with snow from November to April. The snowmobile trail provides a means of controlled access to the refuge in the winter months, and can provide an opportunity for visitors to engage in wildlife-dependent recreation. Relocation of the trail to off-refuge lands will require substantial effort and expense, and will undoubtedly result in greater impacts on wetlands than the existing trail, which impacts no wetlands in the vicinity of the refuge. Due to the snow cover, visitor impact is minimized during winter months since the ground is often frozen and fewer species and fewer numbers of wildlife are present. This is an historic use of the refuge, and is consistent with the environmental assessment prepared for the refuge's establishment (USFWS 1988, pg. 5). This use has been allowed on the refuge since the refuge was established with no significant adverse effects observed.

AVAILABLITY OF RESOURCES:
With the hiring of a refuge officer, and a zone officer for Maine, Vermont, and New Hampshire, the resources necessary to provide and administer this use, at its present levels, are available within current and anticipated refuge budgets. Staff time associated with administration of this use relates to overseeing trail maintenance, issuing SUPs, and monitoring compliance with their conditions, enforcing laws, monitoring public use, and monitoring impacts on natural resources.

The refuge manager will administer the program. A wildlife biologist will monitor its effects on refuge resources. The refuge officer will monitor visitor use and conduct law enforcement for visitor safety and resource protection.

We estimate below the annual costs associated with the administration of snowmobiling on the refuge.

Overall oversight of program and Coordinate with State of Maine:	$1,000 GS-13 Refuge Manager
Administer SUPs/Coordinate with snowmobile clubs/ Oversight of trail maintenance:	$2,000 GS-12 Deputy Refuge Manager
Law enforcement patrol/Visitor-resource protection/ Public use monitoring/Enforcement/Outreach:	$3,000 GS-9 Refuge Officer
Resource impacts/Monitoring:	$3,000 GS-11 Wildlife Biologist
Snowmobile gas/Maintenance:	$1,000
Estimated Total Cost:	**$11,000**

All maintenance of snowmobile trails will be the responsibility of other parties (snowmobile clubs, volunteers, etc.). The refuge owns and operates snowmobiles for carrying out law

enforcement, refuge operations, and monitoring public use. Officers from Maine Department of Inland Fisheries and Wildlife occasionally supplement law enforcement coverage on the refuge, at no cost to us.

ANTICIPATED IMPACTS OF THE USE:
The original ITS-84 snowmobile trail at the Sunkhaze Meadows Unit was established before the refuge was created in 1988. The old trail traversed a portion of the refuge which included sensitive wetland habitats. After the refuge was created, the refuge manager worked with the local snowmobile club to reroute the trail, moving it away from the sensitive wetland habitats. The current 4.6-mile portion of the trail that crosses the refuge passes through forested upland. Relocation of the trail to off-refuge lands will require extensive effort and expense, and will undoubtedly result in greater impacts on wetlands than the existing trail, which impacts no wetlands in the vicinity of the refuge.

Currently, the snowmobile trail at the Sandy Stream Unit bisects the refuge. To minimize habitat fragmentation and potential disturbance to wildlife associated with trail use and maintenance activities, we propose relocating the trail to the unit's western edge, near the existing road (see map B 24). Effects of relocating the trail are discussed in the refuge's comprehensive conservation plan (CCP)(USFWS 2013).

Wildlife Impacts:
The area on the refuge encompassed by snowmobile trails totals approximately 12.4 acres, or about 0.1 percent of the refuge's total area. This includes lengths of snowmobile trails on all three units multiplied by an expected width of 15 feet. Snowmobile trails traverse the spruce-fir, northern hardwood, and mixed conifer-hardwood habitats that are typical on the refuge. Wildlife species occurring in the habitats traversed by trails include: various migratory birds, resident birds (including spruce and ruffed grouse), snowshoe hare, moose, white-tailed deer, and various furbearers. Black bears, reptiles and amphibians, beaver, and brook trout also occur in habitats traversed by snowmobile trails, but normally are within hibernacula or under ice when snowmobiling occurs. Deer wintering areas located in the northeast corner of the Sunkhaze Meadows Unit and the Benton Unit are outside the snowmobile trails areas. Also, many of the bird species present during the summer and fall have migrated to southern wintering grounds.

Winter is a particularly stressful time for many species of resident wildlife, because of the reduced availability and quality of food and the higher energetic costs of snow travel and thermoregulation. Late winter is a particularly vulnerable time for many species (especially ungulates), because snow depths are often greatest, the animals are in their poorest condition, and food resources have been exhausted.

Snowmobiles are capable of covering large areas and thus have the potential for disturbing wildlife and compacting snow over a large area, if they are not confined to designated trails (Hammitt and Cole 1998). Some potential negative impacts of snowmobiling (and other forms of human disturbance) on wildlife include:

- Increased energy expenditure. Disturbance may result in increased heart rate, activity, or actual flight, all of which have an energetic cost. During severe winters or for animals in poor or marginal condition, the additional stress of disturbance may result in exhaustion

of an individual's food reserves, and lowered resistance to disease or predation. That may affect survival or reproduction. Animals may be in poorer condition going into the spring breeding season.

- Displacement to suboptimal habitat. Animals may be forced into habitats where foraging or cover is of lower quality. This may increase energetic costs, increase vulnerability to predation, or increase crowding and disease transmission. It may alter the distribution of animals on the landscape.
- Alteration of behavior. Disturbed animals may change their foraging times to periods when energy losses or exposure to predators is higher.
- Changes in community composition and inter-species interactions.
- Improved predator access to prey wintering areas (a benefit to predators, but a negative impact to prey).
- Direct mortality from snowmobile-wildlife collisions.

Some potential, positive impacts of snowmobiling and other forms of human disturbance on wildlife follow:

- Reduced energy expenditure. Snow compaction and trail creation by snowmobiles may reduce energy expenditure in deep snow for animals that follow snowmobile trails.
- Improved access to resources. Snow compaction and trail creation by snowmobiles may expand access to foraging areas, for animals using trails.

Although a moderately extensive body of literature treats the impacts of snowmobile activity on wildlife, particularly ungulates, the site-specific nature of much of the research and the complex interactions among the factors affecting wildlife make interpreting results and extrapolating them for Sunkhaze Meadows NWR difficult. The differences in methodology among studies make it difficult to compare them, and have compounded the problem. As a result, different studies have found apparently contradictory results that seem to be applicable only locally.

A few of the variables that may affect the type and degree of wildlife response to snowmobiles include the:

- Severity of winter snow conditions
- Type of vegetation or habitat
- Topography
- Time of day and month of year
- Level of habituation to disturbance
- Animal age and condition
- Species type
- Animal density and group size
- Animal activity type (standing versus bedded down)
- Intensity of hunting
- Intensity of snowmobile activity
- Duration of disturbance
- Behavior of snowmobile users

Mammals may show less of an overt response to human disturbance when winter conditions are particularly severe and energy conservation is at its most critical (Knight and Cole 1995). Impacts may be at the individual or population scale and may be either short- or long-term. Despite the apparent contradictions in the literature, many studies seem to indicate that snowmobiling may affect wildlife under certain conditions. Although population level impacts may exist, only impacts at the individual and local level have been demonstrated. Appropriate management can mitigate many of the negative effects.

Ungulates (white-tailed deer; moose)
White-tailed deer expend more energy in winter than at other times of the year. To compensate, deer usually conserve energy by restricting their movements, particularly in late winter, when they lack fat reserves and snow is deeper, rather than increasing their food intake by foraging more widely (Moen 1976). Energy conservation measures include walking slowly, on level ground. Thus, they are particularly vulnerable to disturbances that counter that energy conservation strategy.

Most ungulates react more strongly (are more likely to flee, travel a greater distance) to a person on foot than a person on a snowmobile. Stopping or getting off a vehicle creates more disturbance than a person on a continuously moving snowmobile (Oliff et al. 1999). Response to snowmobiles is greater in areas open to hunting than in areas closed to hunting.

No active flight responses were seen at distances greater than 650 feet. Response intensity increased with increasing size of a snowmobile group. The disturbance of wildlife tends to be less when human activities are fairly predictable both in location and behavior. Animals may habituate to predictable disturbance, and show less of a behavioral or physiological response. Snowmobile activities on fixed designated trails create fewer disturbances than activity that occurs randomly across the landscape (Oliff et al. 1999).

Wildlife seem to demonstrate a less intense response to disturbance when there is some sort of visual barrier between them and the source of disturbance created by vegetation and/or topography (Oliff et al. 1999).

Deer and moose are more likely to forage in the early morning or evening, therefore, these are the times they are most likely to encounter, and possibly be disturbed by, snowmobiles (Oliff et al. 1999).

Severinghaus and Tullar (1975) suggested that snowmobile disturbance might be energetically costly to deer. Although deer sometimes use snowmobile trails, those trails may not lead to the best foraging areas, or may help to concentrate foraging in a restricted area and contribute to over-browsing. They recommended keeping snowmobile trails at least 0.5 miles from deer wintering areas. In a controlled experiment, Freddy et al. (1986) found that snowmobiles invoked flight responses in mule deer at distances less than 440 feet. Distances traveled by fleeing deer averaged 330 feet. Deer demonstrated low levels of response (alerting) up to distances of about 1,540 feet. Freddy et al. (1986) suggest that keeping snowmobile trails greater than 1,500 feet from deer will minimize any disturbance. The study found no evidence of increased mortality or

impairment of reproduction, but deer may not have been disturbed often enough to show an effect.

Eckstein et al. (1979) experimentally exposed white-tailed deer to snowmobile activity, and found no differences in home range size, habitat use, or activity by white-tailed deer in areas with snowmobile activity versus areas without it. However, deer were displaced from an area within 200 feet of snowmobile trails. The study found that deer were less disturbed by snowmobile activity at night than during the day. Deer were found to use snowmobile trails occasionally, but did not seem to use snowmobile trails in preference to their own trails, or follow snowmobile trails beyond their normal wintering area. They concluded that, although there might be some energy savings for the deer from using snowmobile trails, the effects of snowmobiles forcing deer off of trails will counter balance those savings. They also recommended that snowmobile trails avoid deer wintering areas by rerouting through upland deciduous forest wherever possible.

Richens and Lavigne (1978) also found that white-tailed deer in Maine sometimes used snowmobile trails for short distances (less than 660 feet), especially when they were near bedding areas. Deer were more likely to use snowmobile trails under more severe winter conditions, when snow depths were greater. Deer were less likely to use snowmobile trails on wide logging roads that were less sheltered. Unlike the Eckstein et al. (1979) study, Richens and Lavigne found that deer could be persuaded to follow snowmobile trails over a mile beyond their own trail system when improved forage was provided at the new location. The study suggests that snowmobile trails could be laid out in deer wintering areas in a way that could benefit deer, by improving their mobility, reducing energy costs, and providing access to better foraging areas. Deer continued to use bedding areas close to snowmobile trails and did not appear to alter their activity patterns in response to snowmobiles, but snowmobile traffic in their study area was relatively light. The flight responses of deer to snowmobiles varied, depending on severity of winter, snow depth, type of cover, and time of day. Deer were more likely to flee from snowmobiles in early winter than in late winter. The poor condition of deer towards the end of winter may have contributed to this reduction in flight tendency. Richens and Lavigne also found deer were more likely to flee from snowmobiles traveling at high speeds than at low speeds (less than 10 mph).

In contrast to some other studies, Dorrance et al. (1975) found increases in white-tailed deer home range size, movement, and distance to snowmobile trails with increased snowmobile activity for an area previously closed to snowmobile use (but open to hunting). Deer failed to show these changes in movement patterns with increased snowmobile activity at a second study site that was open to snowmobile traffic but closed to hunting. At the second site, deer were displaced from the immediate vicinity of active snowmobile trails, but usually returned shortly after snowmobile activity stopped. That effect was seen even at very low levels of snowmobile activity. The habituation of deer to snowmobile activity may have been facilitated at this second site, where hunting was not permitted. However, in this study, displacement of deer from snowmobile trails probably did not result in a significant impact on deer except during particularly severe winters and/or on poor winter ranges.

Huff and Savage (1972) found that white-tailed deer in Minnesota utilized conifer (jack pine) areas with dense canopy cover during the middle of the week when snowmobile traffic was light, but shifted to a more open canopy aspen-birch stand during weekend heavy-use periods. They reported that radiant heat loss was higher in the aspen-birch stand than in the jack pine.
Moen (1982) found that heart rates of captive white-tailed deer increased when they were approached by snowmobiles, even when no change in their behavior was discernible. Deer also failed to habituate to snowmobiles (as measured by elevated heart-rates) over the course of the experiment. Moen (1982) suggested that there might be an energy cost to elevated heart-rate.

Although moose are considerably better adapted to deep snow and winter conditions than deer, severe winters can still stress them if food supplies are exhausted or if they are in poor condition. Like deer, moose tend to reduce their activity levels in winter as an energy conservation measure, and disturbances that cause them to increase their activity come at an energetic cost.

Collescott and Gillingham (1998) found that moose that bedded down within approximately 1,000 feet of an active snowmobile trail, or fed within 500 feet of snowmobile traffic, were likely to change their behavior in response to snowmobile disturbance. Moose within 1,000 feet of snowmobile traffic were sometimes temporarily displaced into less favorable foraging habitat. However, they did not find a significant impact on moose activity patterns within their study area associated with snowmobile traffic. Moose, in general, appear to habituate fairly readily to vehicle activity and will flee at shorter distances if they have become habituated.

The existing snowmobile trails are, at their closest point, approximately 2 miles west of the deer wintering area mapped within the Sunkhaze Meadows Unit. This 2-mile buffer consists of northern hardwood-mixed forest and peatland-wetland complex. This exceeds the recommended 0.5-mile buffer recommended by Freddy et al. (1986). At Benton Unit, the existing snowmobile trail passes through the edge of a mapped deer overwintering area. However, the vegetation in this portion of the site has changed from forest to grassland since it was originally mapped. Therefore, this area does not currently contain suitable habitat for deer overwintering. Instead, the edge of the northern hardwood-mixed forest (where suitable overwintering may occur) is located approximately 500 feet to the north, although most deer likely overwinter further within the mapped deer wintering area, away from the forest edge.

We expect adverse impacts on these species to remain low for the following reasons: 1) this use is a traditional use of refuge lands and has been occurring for many years, 2) refuge staff have not observed adverse impacts to these species in all of these years, 3) snowmobile trails avoid deer wintering areas, and 4) this use is expected to remain low and is therefore not expected to be intense or frequent. Under this plan, we will continue to monitor the refuge for potential impacts and will limit access or close areas as needed to protect resources. We will also continue to vary from State regulations in that we will not allow baiting on any refuge unit or at Carlton Pond WPA.

Black Bears

Black bears will abandon den sites if humans on foot disturb them sufficiently, and may abandon cubs (Goodrich and Berger 1994). Bears that abandon or change dens may remain active longer and experience more weight loss than undisturbed animals. Bears are particularly vulnerable to

disturbance just before denning (generally November through December), and just after they emerge from dens in the spring (March through April) (Oliff et al. 1999).

Other Carnivores (fisher, marten, weasels, red fox, coyote)
Little research has been done on disturbance effects on any of these species. However, fishers do not appear to alter their activity significantly in response to moderate levels of human disturbance. When disturbed, females fishers may move their den sites (Oliff et al. 1999). Weasels and pine marten frequently tunnel under the snow when foraging. Snow compaction caused by snowmobile trails may affect their foraging ability locally, as well as negatively impact prey populations (small mammals).

Neumann and Merriam (1972) found that red foxes exhibited greater levels of activity near snowmobile trails and were using trails as travel corridors. Coyotes increase their use of snowmobile trails during severe winters as well (Crete and Lariviere, 2003).

Other Mammals (snowshoe hare, small mammals)
Neumann and Merriam (1972) found that hare activity was reduced within 250 feet of snowmobile trails. They also found that a single passage of a snowmobile could significantly alter the insulating properties and temperature gradient of snow to a depth of 2 feet. Those changes in temperature regime were potentially great enough to increase energy costs to small mammals burrowing under the snow.

Jarvinen and Schmid (1971) found a significant increase in mortality of small mammals in an area where snow had been compacted experimentally by snowmobiles. Small mammals did not appear to migrate off-site in response to snowmobile activity. They suggested that causes of mortality might have been related to the reduced insulating capacity and increased thermal conductivity of the compacted snow which may have increased thermal stress on animals. Snow compaction may also have limited movement of animals and reduced the permeability of the snow to a point that inhibited gas exchange and increased levels of carbon dioxide above normal. If extensive, off-trail snowmobile activity compacts large areas of snow, the impacts on small mammal populations may be significant (Olliff et al. 1999).

Anticipated impacts of snowmobile activity on refuge wildlife include displacement of wildlife immediately adjacent to trails and some potential for contamination of streams with sediment or exhaust. The current route of Maine ITS-84 trail and associated connector trail traverse mixed and hardwood forest. We are not aware of any nesting bald eagle pairs at the Benton or Sandy Stream Units. While we are not sure of exact locations of current eagle nests on the Sunkhaze Meadows Unit, it is unlikely current snowmobile use is adversely affecting this species on the refuge. This use is an ongoing use of the refuge and appears to have been occurring at relatively consistent rates over the past nearly two decades. Because snowmobiling begins before eagle nesting season begins, at the Sunkhaze Meadows Unit any nesting eagle pairs that may be disturbed by this activity will be able to nest in suitable habitat on the refuge away from the snowmobile trails.

We will assess these trails and may re-route or close some of them if significant resource impacts seem likely. The use of well-constructed and maintained culverts and bridges over stream

crossings helps to minimize the contamination of streams and impacts to stream amphibians. Much of the disturbances to wildlife noted in literature are from snowmobiles that are not on designated trails and are traveling all over the landscape in unpredictable ways. Restricting snowmobile traffic to designated trails helps to increase predictability. The existing trails have been in place for decades and predate the establishment of the refuge. The snowmobile use at Sunhaze Meadows NWR is currently at very low levels based on weekly law enforcement patrols the last 2 years which supports our assessment of that adverse impacts associated with this activity are expected to be and remain low.

Habitat Impacts:

Vegetation

Several studies have found that snowmobiles damage vegetation. This may involve direct, mechanical damage as well as the alteration of soil and substrate conditions important for plant growth. The extent of impacts depends on the plant species, their sensitivity to cold and mechanical damage, snow depth, winter severity, and soil type and slope, among others.

Neumann and Merriam (1972) found that after a single passage by a snowmobile, over 25 percent of all tree saplings at or above the snow surface were damaged severely enough to cause mortality. Seventy-eight percent of saplings showed some signs of damage. Species with rigid woody stems were the most vulnerable. All vegetation above the snow surface was eliminated mechanically in heavily traveled areas.

Wanek (1974, 1971) found that soil temperatures were significantly colder and more variable under snowmobile trails than under un-compacted snow. That change occurred after the first snow compaction event. Soil froze sooner, deeper, and remained frozen for a longer time than under un-compacted snow. Soils under snowmobile tracks thawed out as much as three weeks later than under control areas. Temperature regimes varied, depending on the soil type. Sandy soils remained colder in the winter than did organic soils. Soil temperatures under hardwood forests remained colder than under softwoods. Some species of spring plants under snowmobile trails experienced up to 20 percent winter mortality, or no growth, delayed growth, or delayed or reduced flowering. Underground root structures were frozen and damaged in some instances. Species with large underground storage structures experienced the greatest damage due to freezing. Wanek (1974) also found that in an alfalfa field subjected to snow compaction by snowmobiles, productivity decreased by 24 to 33 percent. Weedy species also showed an accompanying increase. The decline in productivity was steeper during a more severe winter than during a milder winter. Wanek (1974, 1971) also found conifer sapling damage and mortality from snowmobile trails, particularly under low snow conditions. The damage to white spruce was highest. Some species, including trembling aspen and raspberry, increased in areas of snowmobile activity.

Bogs appear to be particularly sensitive to snowmobile activity. Wanek (1974) found a decline in some bog plants, with increasing snowmobile activity. Although sphagnum appeared to be unaffected, declines were observed in bog laurel, leather leaf, small cranberry, and pitcher plant. Impacts appeared to be due to mechanical damage, cold penetration, and desiccation.

Pesant et al. (1985) tested the effects of snowmobiling on agricultural fields. They found that in certain forage types, snowmobile trails resulted in reduced or delayed spring growth, changes in species composition, and reduced forage yield. Impacts were attributed to reduced soil temperatures under compacted snow, and deeper frost penetration into the soil, with accompanying damage to plants. Foresman et al. (1976) also found an early spring reduction in the growth of bluegrass under snowmobile trails, but found that vegetation had recovered by early summer. Matted vegetation under snowmobile tracks may have kept soil temperatures lower in the spring, and made it physically more difficult for new growth to penetrate the matted layer.

Keddy et al. (1979) found that snow compaction was greatest when snowmobiles traversed an area on several different days (increased frequency) than if they traversed the same area multiple times on the same day (increased intensity). Increased frequency of snowmobile use resulted in a decrease in standing crop on an old field, but no significant decrease occurred with greater intensity. Some shift in plant community structure also was noted. No significant impacts on vegetation were observed on an ice-covered marsh. Negative impacts of snowmobiling on vegetation may result from lower temperatures affecting buds and food storage structures, and longer snow retention in the spring may affect early germination and growth. Matting of vegetation may affect seed dispersal from previous year's seedpods.

Boucher and Tattar (1975) found that damage to vegetation and soils was greatest where snowmobile trails were located on steep (greater than 30 degrees) south-facing slopes. Damage primarily resulted from decreased snow depths (due to greater solar radiation), together with increased pressure of snowmobile treads on steeper slopes. On steep slopes, the surface organic layer, and in some instances the upper soil layer, were lost. Damage to plants included not only above-surface parts, but also damage to shallow root systems. Although vegetation recovered on flatter areas receiving moderate use, highly disturbed steep slopes did not.

Snowmobile use is limited to specific designated trails. Based on weekly law enforcement patrols, the current snowmobile use is at low levels and little unauthorized off-trail use occurs. We predict this use will remain low; therefore, it is not intense or frequent and is not expected to have noticeable adverse impacts to refuge habitats outside of the footprint of the trail itself.

Soil and Litter

The compaction of snow under snowmobile trails results in changes in thermal conduction and snow structure that cause snowmobile trails to melt more slowly in the spring and can create partially anaerobic conditions. The rates of litter decomposition may slow as a result. Neumann and Merriam (1972) found that the water holding capacity of snowmobile trails was significantly reduced. That could reduce the ability of the snow to hold water during spring runoff.

In contrast to this, Aasheim (1980) suggested that the delayed melting of compacted snowmobile trails might actually contribute to a reduction in peak runoff amounts.
Boucher and Tattar (1975) found that snowmobile activity on steep, south-facing slopes could disrupt or remove the surface layer of soil and increase erosion during spring rains. Some reports (Aasheim, 1980), indicate that soil erosion may be reduced on flatter areas under some

circumstances because the compacted snow on snowmobile trails may protect against erosion from spring runoff.

There appears to be general agreement that snowmobile activity on steeper slopes can increase erosion, particularly with shallow snow depths and vegetation disturbance.

The impacts of snowmobiles on soils and vegetation under shallow snow conditions may be as significant as when snowmobiles travel on bare ground (Hammitt and Cole, 1998).

Foresman et al. (1976) found no evidence of soil compaction under snowmobile trails. The anticipated impacts from snowmobiling include damage to vegetation from snowmobile activity during the winter and from brush clearing during the fall, and some potential for soil erosion. There are no known rare plants or plant communities along the present route. Snowmobile trails at Sunkhaze have been rerouted in the past to address concerns over soil and wetland impacts. There are no designated trails that occur on steep, south facing slopes. Refuge personnel will continue to monitor the trails for signs of impacts and will either close the trail or re-route the trail to a more suitable location.

Pollution:

Water Quality

Adams (1975) found high levels of hydrocarbons after ice-out in the water of a small (2.5 acres), shallow pond that had been experimentally exposed to snowmobile exhaust. Brook trout exposed to the pond water were shown to have incorporated exhaust components (hydrocarbons). Hydrocarbons increased from undetectable levels in the water, pre-treatment to 10 ppm, post-treatment. Exposed fish exhibited hydrocarbon levels of up to 1 ppm. Petroleum hydrocarbons can have pathological effects on fish at very low levels (less than 10 ppb) and may negatively impact reproduction and foraging (Adams 1975). Hydrocarbon concentrations were highest near the water surface after ice-out. Fish may be particularly vulnerable to hydrocarbon contamination in the early spring because they may be in poorer condition, and are more likely to be active near the water surface. The concentration of hydrocarbons in snow is likely to be particularly high on trails where regular grooming constantly packs exposed snow (Oliff et al. 1999). Spring snowmelt may release those hydrocarbons into streams and other bodies of water (Oliff et al. 1999). To what extent the bodies of water on the refuge are at risk of hydrocarbon pollution is unclear. Maine ITS-84 crosses over Sunkhaze Stream at the end of McLaughlin Road and the snowmobile trail at Benton crosses Fowler Brook over a wooden bridge. Snowmobiles can only cross Sunkhaze Stream when the water is frozen. The waterway is protected by a wooden bridge at Benton Unit. Based on the small numbers of snowmobiles using the refuge units, we expect that water pollution impacts will not be significant. Given current low levels of snowmobile use, recent improvements in snowmobile technologies, and large water volumes the impacts are expected to be minimal.

Air Quality

Bishop et al. (2001) found that snowmobiles accounted for 27 percent of the annual emissions of carbon monoxide in Yellowstone National Park, as well as 77 percent of the annual hydrocarbon emissions. Carbon monoxide production was reduced by 13 percent for vehicles using

oxygenated fuels, but hydrocarbon emissions were unaffected. Fan-cooled snowmobiles had lower hydrocarbon emissions than liquid cooled machines.

Although automobiles substantially outnumber snowmobiles 16 to 1 in Yellowstone during the winter, snowmobiles are responsible for up to 90 percent of hydrocarbon and up to 69 percent of carbon monoxide emissions in the park (US GAO 2000). Additionally, 25 percent to 30 percent of snowmobile fuel is released unburned into the atmosphere (US GAO 2000).

The anticipated impacts from snowmobiles include some exhaust emissions to the air and possibly refuge streams. The refuge currently has no data on stream or air quality.

Noise
Snowmobile noise is readily detectable by wildlife at distances up to several kilometers. The effects of disturbance on wildlife are quite variable, and many species seem to be capable of habituating to it (Bowles 1995). There is no clear evidence for noise having an impact at the population level (Bowles 1995). Noise may have an impact on the experience of other human users on the refuge. We have not measured noise levels on the refuge, but they are probably noticeable near trails and on Sunkhaze Meadows NWR during busy winter weekends. Because of the ability of snowmobile noise to travel over great distances, much of the noise on the refuge probably comes from off-refuge snowmobile activity, over which the refuge has no control, as well as from on-refuge activity. We will minimize conflicts among users by restricting snowmobile use to designated trails, thus leaving the remainder of the refuge open to other users.

Summary of Anticipated Impacts:
Although the information available about the effects of snowmobiling on designated trails is incomplete, at its current and anticipated levels and patterns of use, we do not expect it to constitute significant short-term or long-term impacts separately or cumulatively. We will evaluate all trails every annually to ensure there are not site-specific impacts. We will reroute or close any trails if we determine that they have a significant, negative impact on wildlife or habitat.

Snowmobile trails are located on existing utility powerlines and trails.. The location for the trails has effectively mitigated impacts of snowmobiling relating to soil and vegetation on those surfaces. The bridges and culverts crossing the water courses are designed to support trucks and other heavy equipment. Therefore, additional impacts from snowmobiling are unlikely. Snowmobile trails throughout the area have been established for many years and pre-date refuge ownership. Because the wildlife potentially affected are accustomed to that use, we consider impacts on wildlife minimal. Increases in emission regulations by the U.S. Environmental Protection Agency, along with the increase in the number of 4-stroke and new cleaner 2-stroke engines in modern snowmobiles has and will continue to reduce the potential impacts on the environment described in the literature review. The increased presence of a law enforcement officer and zone officer will ensure stipulations that support the compatibility of this use. Therefore, snowmobiling on Sunkhaze Meadows NWR poses only a minimal threat to goals 3 (“Promote the biological integrity, diversity, and environmental health of the Sunkhaze Meadows Unit’s wetland, forest, and aquatic habitats to protect water quality and sustain native plant communities, rare plants, and wildlife, including species of conservation concern,” and

"Provide grassland, shrubland and aquatic habitats at Benton and Sandy Stream Units to sustain a diversity of wildlife, including species of conservation concern") as written in the comprehensive conservation plan (CCP). Our continued monitoring of the effects of snowmobiling is necessary to understand better their impacts on refuge habitats, plant and wildlife communities, and human visitors. Monitoring will identify any actions needed to respond to new information and correct problems that may arise in the future.

Snowmobile trails on the refuge provide an important link in the State trail system and enhance opportunities for the public to experience the winter landscape. Snowmobiling may also benefit goals 4 and 6 ("Promote enjoyment and environmental stewardship by engaging visitors, students, and nearby residents to experience the wetlands, woods, and wildlife at Sunkhaze Meadows Unit," and "Promote enjoyment and environmental stewardship by engaging visitors, students, and nearby residents to experience the wetlands, woods, and wildlife at the Benton and Sandy Stream Units") of the CCP by providing opportunities during winter months for wildlife observation and photography and access for hunting.

PUBLIC REVIEW AND COMMENT:
As part of the CCP process for Sunkhaze Meadows NWR and Carlton Pond Waterfowl Production Area, this compatibility determination was available for public review and comment for 39 days concurrent with the release of our draft CCP and environmental assessment.

DETERMINATION (check one below):
This use is compatible __X__

This use is not compatible _____

STIPULATIONS NECESSARY TO ENSURE COMPATIBILITY:

- Snowmobile clubs must continue to operate within the terms of the SUP issued to them every year.

- Snowmobiles will only be permitted on designated trails (maps B.22, B.23, and B.25)

- Snowmobile trails will only be open for use when all areas of the trail have generally contiguous snow cover.

- All trails will be located on existing roadbeds, wherever possible, to minimize vegetation damage. Trails will also be kept away from streams to avoid erosion. Where stream crossings are unavoidable, sighting and construction of bridges or culverts will follow best management practices, and crossing structures will be maintained in good repair.

- Trails will be located away from areas of unique or sensitive vegetation, such as bogs or wetlands.

- Snowmobile trails will be located so that they are away from deer wintering areas and do not run between deer bedding and feeding areas. Trails are also located in upland

deciduous forest, and will be kept out of drainage bottoms and coniferous riparian areas important for wildlife such as fisher, marten, and moose, wherever possible.

- All trails will be surveyed for signs of wildlife activity, sensitive vegetation, or erosion potential, and trail locations will be entered into a geographic information system. We will use that information to guide routing, re-routing, or closure of trails. Biological inventories will continue to provide baseline information for measuring change. Should the monitoring and evaluation of the use indicate that the compatibility criteria have or will be exceeded, appropriate action will be taken to ensure continued compatibility, including modifying or discontinuing the use.

- The refuge will institute a public outreach program (brochures, signs) when funding is available to help educate the public about refuge regulations, safety, and how to minimize disturbance of wildlife.

- Routine law enforcement patrols will be conducted throughout the year to promote compliance with refuge regulations and provide educational outreach, help monitor public use patterns, public safety, and document visitor interactions. Refuge officers may record visitor numbers, vehicle numbers, visitor activities, and locations of the activities to document current and future levels of refuge use. Conditions that are a risk to public safety will be identified, and appropriate action will be promptly taken to correct such conditions.

JUSTIFICATION:
This is an existing use of the refuge. This use is consistent with the Service's environmental assessment prepared for the refuge's establishment where we stated that we will continue to allow this use if compatible (USFWS 1988, pg. 5). Allowing snowmobiling at Sunkhaze NWR, as stipulated in this document, will not materially interfere with, or detract from, the mission of the National Wildlife Refuge System of the purposes for which the refuge was established. As listed in the purposes section of this compatibility determination, the refuge was established and subsequently land was acquired for two main purposes. As discussed under the section on anticipated impacts above, the short portion of the trail that crosses the Sunkhaze Meadows Unit passes through a forested upland type habitat. Relocation of the trail to off-refuge lands will require substantial effort and expense, and will undoubtedly result in greater impacts on wetlands than the existing trail, which impacts no wetlands in the vicinity of the refuge. Adverse impacts to soils and vegetation from this use are minimized during winter months since snowmobiling is limited to established trails and the ground is often frozen. Adverse impacts on wildlife are minimized because fewer species and fewer numbers of wildlife are present during winter months when most of this use occurs. In addition, snowmobile trails throughout these areas have been established for many years and pre-date Service ownership. Because the wildlife potentially affected are accustomed to that use, we consider impacts on wildlife minimal. This use has been allowed on the refuge since the refuge was established with no significant adverse effects observed.

Snowmobiling will not materially interfere with or detract from the endangered species aspect of the refuge's purposes, because there are no federally listed threatened or endangered species

known to occur on the refuge. This activity will not materially interfere with or detract from the mission of the Refuge System, because of the limited impacts to refuge resources, because it facilitates priority public uses, and because of the stipulations specified above. For all of these reasons, we have determined that this use, as stipulated, is consistent with the wildlife and habitat aspects of the refuge's purposes, the Service policy on compatible uses, the National Wildlife Refuge System Improvement Act of 1997, and the broad management objectives of the National Wildlife Refuge System.

SIGNATURE:

Refuge Manager: Beth Goettel (Signature) 8/19/2013 (Date)

CONCURRENCE:

Regional Chief: (Signature) 9/17/2013 (Date)

MANDATORY 10 YEAR RE-EVALUATION DATE: 9/17/2023

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FWS Form 3-2319
02/06

Finding of Appropriateness of a Refuge Use

Refuge Name: Sunkhaze Meadows National Wildlife Refuge and Carlton Pond Waterfowl Production Area

Use: Research conducted by non-Service personnel

This exhibit is not required for wildlife-dependent recreational uses, forms of take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision criteria:	YES	NO
(a) Do we have jurisdiction over the use?	X	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	X	
(c) Is the use consistent with applicable Executive orders and Department and Service policies?	X	
(d) Is the use consistent with public safety?	X	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?	X	
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	X	
(g) Is the use manageable within available budget and staff?	X	
(h) Will this be manageable in the future within existing resources?	X	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	X	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D. for description), compatible, wildlife-dependent recreation into the future?	X	

Where we do not have jurisdiction over the use ("no" to (a)), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to (b), (c), or (d)) may not be found appropriate. If the answer is "no" to any of the other questions above, we will **generally** not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes X No ___

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate: ____ **Appropriate:** X

Refuge Manager: Beth Goettel Date: 8/19/2013

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use.

If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence.

If found to be **Appropriate**, the refuge supervisor must sign concurrence:

Refuge Supervisor: [illegible] Date: 9/11/13

A compatibility determination is required before the use may be allowed.

Justification for a Finding of Appropriateness of a Refuge Use

Refuge Name: Sunkhaze Meadows National Wildlife Refuge and Carlton Pond Waterfowl Production Area

Use: Research conducted by non-Service personnel

Narrative:
Research by non-U.S. Fish and Wildlife Service (Service) personnel is conducted by colleges, universities, Federal, State, and local agencies, non-governmental organizations, and qualified members of the general public to further the understanding of the natural environment and to improve the management of Sunkhaze Meadows National Wildlife Refuge (Sunkhaze Meadows NWR, refuge) and Carlton Pond Waterfowl Production Area's (WPA) natural resources. Much of the information generated by the research is applicable to management on and near the refuge. In many cases, research by non-Service personnel ensures the perception of unbiased and objective information gathering, which can be important when using the research to develop management recommendations for politically sensitive issues. Additionally, universities and other federal partners can access equipment and facilities unavailable to refuge staff for analysis of data or biological samples. This use is therefore beneficial to the refuge and WPA's natural and cultural resources.

Research conducted by non-Service personnel will also enable the Service to better achieve three goals in the refuge and WPA's comprehensive conservation plan (USFWS 2013) because these data will help refuge staff make informed decisions. In addition, because this use could aid in the protection of fish and wildlife resources, it promotes the fulfillment of the refuge purpose of protecting fish and wildlife resources (Fish and Wildlife Act of 1956; 16 U.S.C. 742f (a) (4)). Research purposes fits into the description of 603 FW1 1.10(D), Specialized Uses. Specifically, research with partners is actively encouraged under 1.10 (D)(4).

The Service will encourage and support research and management studies on refuge and WPA lands that will improve and strengthen natural resource management decisions. The refuge manager will encourage and seek research relative to approved refuge objectives that clearly improves land management and promotes adaptive management. Priority research addresses information that will better manage the Nation's biological resources; is generally considered important to agencies of the Department of the Interior, the Service, the National Wildlife Refuge System, and State fish and game agencies; and that addresses important management issues or demonstrates techniques for management of species or habitats.

Refuge staff will also consider research for other purposes that may not be directly related to refuge-specific objectives, but contribute to the broader enhancement, protection, use, preservation, and management of native populations of fish, wildlife, and plants, and their natural diversity within the region or flyway. These proposals must comply with the Service's compatibility policy.

Evaluating and accepting or rejecting study proposals, as well as conditioning the special use permits (SUP) appropriately will minimize the impacts of and maximize the value of such research. If a research project occurs during the refuge's hunting season, special precautions will be required and enforced to ensure the researchers' health and safety. If conducted according to refuge- or WPA-specific stipulations set forth in the required SUP, this use will not affect the Service's ability to protect, conserve and manage wildlife and their habitats, nor will it impair existing wildlife-dependent recreational uses or reduce the potential to provide quality, compatible, wildlife-dependent recreation uses into the future.

Research therefore has been found appropriate because it is beneficial to the refuge and WPA's natural and cultural resources and it is consistent with the goals and objectives of the CCP (USFWS 2013).

Reference:

U.S. Fish and Wildlife Service (USFWS). 2013. Sunkhaze Meadows National Wildlife Refuge and Carlton Pond Waterfowl Production Area Comprehensive Conservation Plan. September 2013.

COMPATIBILITY DETERMINATION

USE: Research Conducted by Non-Service Personnel

REFUGE NAME: Sunkhaze Meadows National Wildlife Refuge and Carlton Pond Waterfowl Production Area

DATE ESTABLISHED:

Sunkhaze Meadows National Wildlife Refuge: November 22, 1988

Carlton Pond Waterfowl Production Area: November 24, 1965

ESTABLISHING AUTHORITIES:

Sunkaze Meadows National Wildlife Refuge:

1. Fish and Wildlife Act of 1956 (16 U.S.C. 742a-742j; 70 Stat. 1119)
2. Refuge Recreation Act of 1962 (16 U.S.C. 460k-406k-4; 76 Stat. 653)

Carlton Pond Waterfowl Production Area:

1. Migratory Bird Hunting and Conservation Stamp Act of 1934 (16 U.S.C. 718c)
2. Migratory Bird Conservation Act (16 U.S.C. 715d)

PURPOSE(S) FOR WHICH ESTABLISHED:

Sunkhaze Meadows National Wildlife Refuge:

1. "... or the development, advancement, management, conservation, and protection of fish and wildlife resources ..." (16 U.S.C. 742f(a)(4)) "...for the benefit of the United States Fish and Wildlife Service, in performing it activities and services. Such acceptance may be subject to the terms of any restrictive or affirmative covenant, or condition of servitude ..." ((16 U.S.C. 742f(b)(1) (Fish and Wildlife Act of 1956))

2. "... suitable for -- (1) incidental fish and wildlife-oriented recreational development, (2) the protection of natural resources, (3) the conservation of endangered species or threatened species ..." ((16 U.S.C. 460k-1) (Refuge Recreation Act))

Carlton Pond Waterfowl Production Area:

1. "…as Waterfowl Production Areas" subject to "...all the provisions of such Act [Migratory Bird Conservation Act] …except the inviolate sanctuary provisions…" (16 U.S.C.718c (Migratory Bird Hunting and Conservation Stamp Act))

2. "…for any other management purpose, for migratory birds." (16 U.S.C. 715d (Migratory Bird Conservation Act))

MISSION OF THE NATIONAL WILDLIFE REFUGE SYSTEM:

"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." (16 U.S.C. 668dd-668ee) (National Wildlife Refuge System Administration Act of 1966)

DESCRIPTION OF USE:

(a) What is the use? Is the use a priority public use?

The use is research conducted by non-Service personnel. Research conducted by non-Service personnel is not a priority public use of the National Wildlife Refuge System under the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd-668ee), and the National Wildlife Refuge System Improvement Act of 1997 (Public Law 105-57).

(b) Where will the use be conducted?

The location of the research will vary depending on the individual research project that is being conducted. The entire refuge is open and available for scientific research. An individual research project is usually limited to a particular habitat type, plant or wildlife species. On occasion research projects will encompass an assemblage of habitat types, plants or wildlife. The research location will be limited to those areas of the refuge and Waterfowl Production Area (WPA) that are absolutely necessary to conduct the research project.

(c) When will the use be conducted?

The timing of the research will depend entirely on the individual research project that is being conducted. Scientific research will be allowed to occur on the refuge throughout the year. An individual research project could be short term in design, requiring one or two visits over the course of a few days. Other research projects could be multiple year studies that require daily visits to the study site. The timing of each individual research project will be limited to the minimum required to complete the project. If a research project occurs during the refuge hunting season, special precautions will be required and enforced to ensure public health and safety.

(d) How will the use be conducted?

The mechanics of the research will depend entirely on the individual research project that is conducted. The objectives, methods, and approach of each research project will be carefully scrutinized before it will be allowed to occur on the refuge or the WPA. No research project will be allowed to occur if it does not have an approved study plan and protocol or if it compromises public health and safety, or if it is not found appropriate (see below).

In general, we will allow observational research projects (bird banding, bird counts, fur collection from scratching posts, etc.) that do not cause mortality to birds and animals, or involve major manipulations of the ecosystem. Where collecting will be allowed, it will be a critical part of the research, will not involve the collection of threatened or endangered species, and will be carefully restricted to levels not expected to impair populations. For example, over the past 2 years, the students of several local high schools, in conjunction with the Schoodic Education and Research Center, have been doing research on the movement of mercury through the aquatic food chain. Under a special use permit (SUP), they have been allowed to collect a limited number of dragonfly larvae for analysis from specific areas. Part of the study also compared the mercury loads of dragonfly larvae collected at the refuge with levels of those collected elsewhere. This was useful information of interest to the refuge and other Service staff.

Researchers participating in approved studies are allowed off-trail; however, off-trail use is limited to pedestrian access only (e.g., walking, snowshoeing, skiing). Carlton Pond WPA does

not currently have any walking trails, so access to the water is allowed via walking off-trail or through the use of motorized and non-motorized boats.

(e) Why is this use being proposed?
Research by non-Service personnel is conducted by colleges, universities, Federal, State, and local agencies, non-governmental organizations, and qualified members of the general public to further the understanding of the natural environment and to improve the management of the refuge's natural resources. Much of the information generated by the research is applicable to management on and near the refuge and WPA. The Service encourages and supports research and management studies on refuge lands that will improve and strengthen natural resource management decisions.

The refuge manager encourages and seeks research relative to approved refuge objectives that clearly improves habitat management and promotes adaptive management. Priority research addresses information that will better manage the Nation's biological resources and are generally considered important to: Agencies of the Department of the Interior; the U.S. Fish and Wildlife Service; the National Wildlife Refuge System; and state fish and wildlife agencies, and that address important management issues or demonstrate techniques for management of species or habitats. The refuge also considers research for other purposes which may not be directly related to refuge specific objectives, but contributes to the broader enhancement, protection, use, preservation and management of native populations of fish, wildlife and plants, and their natural diversity within the region or flyway. These proposals must comply with the Service's compatibility policy. Refuge support of research directly related to refuge objectives may take the form of funding, in-kind services such as housing or use of other facilities, vehicles, boats, or equipment, direct staff assistance with the project in the form of data collection, provision of historical records, conducting of management treatments, or other assistance as appropriate.

Both the Refuge Manual and the Service Manual provide guidance on allowing research on refuges. The Refuge Manual (4 RM 6.2) lists three objectives that can be met by permitting research on refuges:

1) Promoting new information which will improve the quality of the refuge and other Service management decisions.

2) To expand the body of scientific knowledge about fish and wildlife, their habitats, the use of these resources, appropriate resource management and the environment in general.

3) To provide the opportunity for students and others to learn the principles of field research.

The Service Manual (603 FW 1.10D (4)) provides supplemental guidance in terms of the appropriateness of research on refuges, as follows: "We actively encourage cooperative natural and cultural research activities that address our management needs. We also encourage research related to the management of priority general public uses. Such research activities are generally appropriate. However, we must review all research activities to decide if they are appropriate or not as defined in section 1.11. Research that directly benefits refuge management has priority over other research."

The rationale for this conclusion is clearly stated in the preamble to that policy (71 Federal Regulation 36415):

> Not all research may be appropriate. Some research may affect fish, wildlife, and plants in a manner neither consistent with refuge management plans nor compatible with refuge purposes or the Refuge System mission. Some research may interfere with or preclude refuge management activities, appropriate off the refuge, appropriate and compatible public uses, or other research. Some research may be appropriate off the refuge, but not on the refuge. For example, some natural and physical research may not be wildlife-dependent and may be accomplished successfully at locations off the refuge. Because not all research support establishing purposes of refuges or the Refuge System mission, we cannot define research as a refuge management activity.

AVAILABLITY OF RESOURCES:
The bulk of the cost for research is incurred in staff time to review research proposals, coordinate with researchers and write SUPs. In some cases, a research project may only require one day of staff time to write a SUP. In other cases, a research project may take many weeks, as the refuge staff must coordinate with students and advisors and accompany researchers on site visits.

Annual costs associated with the administration of outside research on the refuge and WPA are estimated below:

Refuge biologist (GS11) (review proposals, coordinate with researchers) 2 days/yr:	$672
Administrative Assistant (GS7) (SUP preparation and administration) 1 day/yr:	$168
Estimated Total Cost:	**$840**

ANTICIPATED IMPACTS OF THE USE:
The Service encourages approved research to further the understanding of the natural resources. Research by other than Service personnel adds greatly to the information base for refuge managers to make proper decisions. Disturbance to wildlife and vegetation by researchers could occur through observation, banding, collecting blood, and accessing the study area by foot, boat, or vehicle. These impacts could be exacerbated by multiple concurrent research projects. It is possible that direct mortality could result as a by-product of research activities. Overall, however, allowing research to be conducted by non-Service personnel should have little impact on Service interests. If the research project is conducted with professionalism and integrity, the knowledge gained far outweighs potential adverse impacts.

Research conducted by non-Service personnel on Sunkhaze Meadows NWR and Carlton Pond WPA poses only a minimal threat to refuge resources because the refuge manager can control the potential for adverse impacts through SUPs, prohibiting multiple research projects from affecting any given area or species at one time. Refuge managers retain the option to prohibit research on the refuge or WPA which does not contribute to the mission of the refuge system or causes undue disturbance or harm. Managers retain the right to revoke or deny renewal for any SUP if unanticipated short-term, long-term, or cumulative impacts are noted.

Ideally, any research project conducted on the refuge will positively contribute to one or more of the refuge goals and/or objectives and may assist in achieving goals 1, 2, and 3 of the refuge's and WPA's comprehensive conservation plan (USFWS 2013). There may be short-term disturbance to plants and wildlife during field investigations—this is unavoidable in most cases. Any threats will be mitigated by the stipulations required under this compatibility determination and any additional conditions specified under each SUP.

PUBLIC REVIEW AND COMMENT:
As part of the comprehensive conservation plan (CCP) process for Sunkhaze Meadows NWR and Carlton Pond WPA, this compatibility determination was available for public review and comment for 39 days concurrent with the release of our draft CCP and environmental assessment.

DETERMINATION (check one below):
This use is compatible __X__

This use is not compatible _____

STIPULATIONS NECESSARY TO ENSURE COMPATIBILITY:

- All researchers will be required to submit a detailed research proposal per Service Policy (FWS Refuge Manual Chapter 4 Section 6).
- The refuge must be given at least 45 days to review proposals before initiation of research. If collection of wildlife is involved, the refuge must be given 60 days to review the proposal.
- The regional refuge biologists, other Service Divisions, State agencies, academic experts, may be asked to review and comment on proposals.
- Proposals will be prioritized and approved based on need, benefit to refuge resources and the Refuge System, compatibility, and funding required.
- Researchers will be expected to submit a final report to the refuge, on completion of their work. For long-term studies, interim progress reports may also be required. The refuge also expects that research will be published in peer-reviewed publications.
- The contribution of the refuge and the Service will need to be acknowledged in any publications.
- SUPs will be required for all research conducted by non-Service personnel. The SUP will list all conditions that are necessary to ensure compatibility. These permits will also identify a schedule for annual progress reports and the submittal of a final report or scientific paper.

- All researchers will be required to obtain appropriate State and Federal collecting or other permits and submit copies if requested to refuge staff prior to the commencement of any approved research on the refuge

- Researchers will be required to take steps specified by Service staff in the SUPs to ensure that invasive species and pathogens are not inadvertently introduced or transferred to Sunkhaze Meadows NWR or Carlton Pond WPA.

JUSTIFICATION:
We have determined that allowing research by non-Service personnel on the refuge and WPA will not materially interfere with, or detract from, the mission of the National Wildlife Refuge System or the purposes for which the refuge was established. In fact, based on the analysis presented above, we have determined that it will contribute to the mission of the National Wildlife Refuge System and the purposes for which the refuge was established. Research by non-Service personnel is conducted by colleges, universities, Federal, State, and local agencies, non-governmental organizations, and qualified members of the general public to further the understanding of the natural environment and to improve the management of the refuge's natural resources. Much of the information generated by the research is applicable to management on and near the refuge and WPA. The Service encourages and supports research and management studies on refuge lands that will improve and strengthen natural resource management decisions. This supports the wildlife and habitat aspects of the purposes for which the refuge and WPA were established and the mission of the National Wildlife Refuge System.

SIGNATURE:

Refuge Manager: Beth Goettel (Signature) 8/19/2013 (Date)

CONCURRENCE:

Regional Chief: Scott B. Kahn (Signature) 9/17/2013 (Date)

MANDATORY 10 YEAR RE-EVALUATION DATE: 9/17/2023

BIBLIOGRAPHY:

U.S. Fish and Wildlife Service. 1985. Refuge Manual. Washington, DC: U.S. Government Printing Office.

COMPATIBILITY DETERMINATION

USE: Wildlife Observation and Photography, Environmental Education and Interpretation

REFUGE NAME: Carlton Pond Waterfowl Production Area

DATE ESTABLISHED: November 24, 1965

ESTABLISHING AUTHORITIES:
Carlton Pond Waterfowl Production Area (WPA) was authorized by administrative action on July 15, 1964. The WPA was officially established when the first parcel was acquired on November 24, 1965. It was established under the following legislative authorities:

1. Migratory Bird Hunting and Conservation Stamp Act of 1934 (16 U.S.C. 718c)

2. Migratory Bird Conservation Act of 1929 (16 U.S.C. 715d)

PURPOSE(S) FOR WHICH ESTABLISHED:

1. "…as Waterfowl Production Areas" subject to "…all the provisions of such Act [Migratory Bird Conservation Act] …except the inviolate sanctuary provisions…" ((16 U.S.C.718c) (Migratory Bird Hunting and Conservation Stamp Act)).

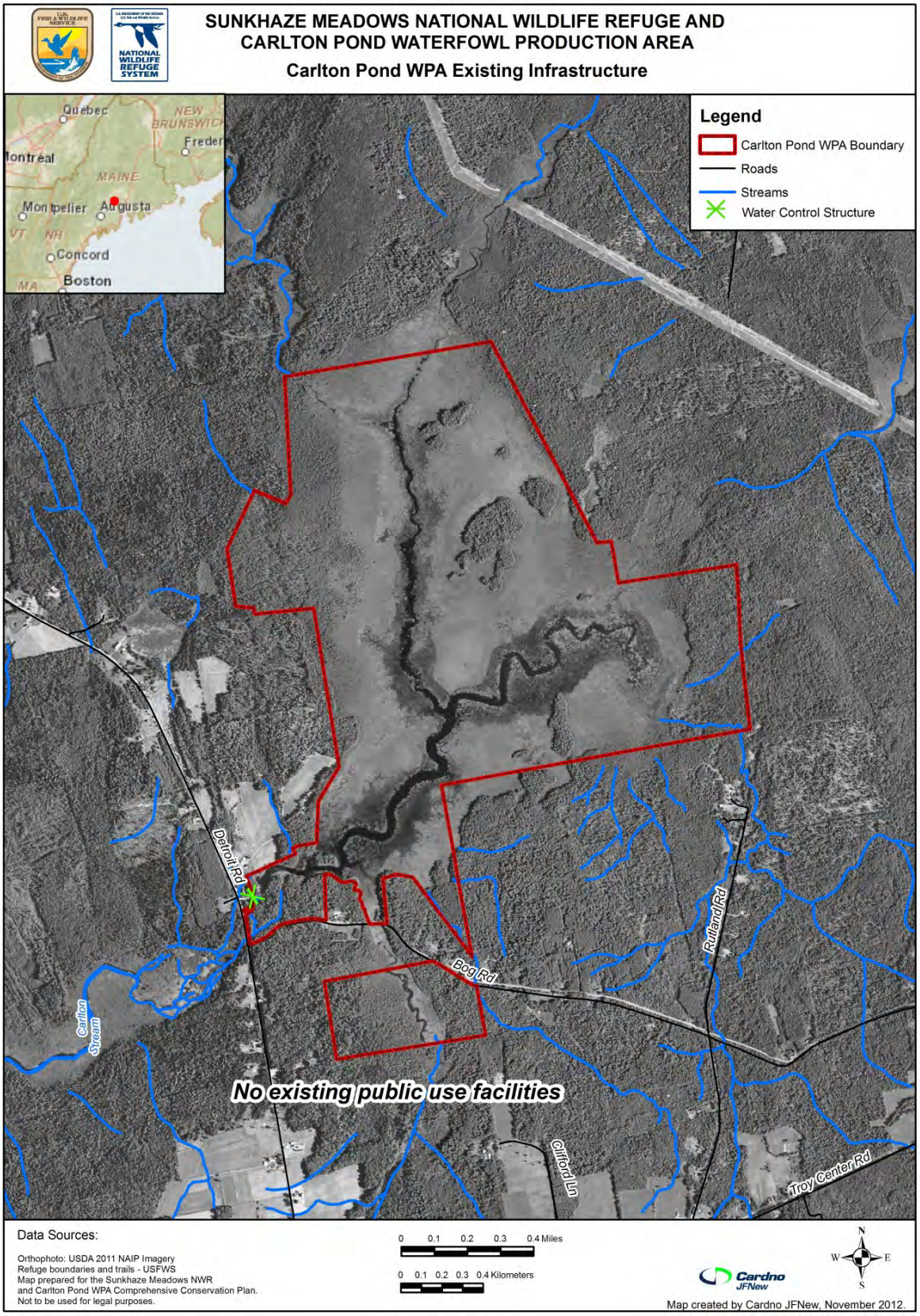
2. "…for any other management purpose, for migratory birds." ((16 U.S.C. 715d) (Migratory Bird Conservation Act)).

MISSION OF THE NATIONAL WILDLIFE REFUGE SYSTEM:
"To administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife and plant resource and their habitats within the United States for the benefit of present and future generations of Americans." (16 U.S.C. 668dd-668ee) (National Wildlife Refuge System Administration Act of 1966)

DESCRIPTION OF USE:
(a) What are the uses? Are they priority public uses?
The uses are wildlife observation, photography, environmental education, and interpretation. These uses are four of the six priority public uses of the National Wildlife Refuge System under the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C 668dd-668ee), and the National Wildlife Refuge System Improvement Act of 1997 (Public Law 105-57).

(b) Where will the uses be conducted?
Wildlife observation, photography, environmental education and interpretation will be allowed to occur throughout the Carlton Pond WPA during open hours (map B.26). No designated trails or photo blinds exist or are planned on the area; most visitors use canoes or kayaks to access the WPA, and opportunities for observation and photography occur on the adjacent road and access point as well as from a canoe, kayak or other boat on the water. The exact locations of environmental education and interpretation activities will be at the discretion of the refuge manager and specified through a required special use permit (SUP).

Map B.26. **S**ervice lands and waters open to compatible public uses within Carlton Pond WPA.



(c) When will the uses be conducted?
Wildlife observation, photography, environmental education, and interpretation will be allowed on the WPA daily, year-round, from sunrise to sunset, unless a conflict with a management activity or an extenuating circumstance necessitates deviating from this. Closures for snow or ice storms, or other events affecting human safety, or for nesting season and other sensitive times of the year are examples that might require these uses be temporarily suspended or require temporary spatial closures of certain areas.

(d) How will the uses be conducted?
Refuge staff will be responsible to provide law enforcement; maintain boundaries and signs; meet with and/or respond to inquiries by adjacent landowners and interested public; recruit and supervise volunteers; prepare information on these uses to be delivered via websites, brochures, and other means; develop necessary signage; monitor and evaluate impacts; regulate the use of the area by groups larger than 10 through SUPs (for example, limiting an environmental education canoe program to one class of 30 on a given day) ; and, if sufficient staff exists, prepare and deliver environmental education and/or interpretation programs. Visitors participating in approved public uses are allowed off-trail; however, off-trail use is limited to pedestrian access only (i.e., walking).

(e) Why are these use(s) being proposed?
Wildlife observation, wildlife photography, environmental education, and interpretation are Priority Public Uses as defined by the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C 668dd-668ee), and the National Wildlife Refuge System Improvement Act of 1997 (Public Law 105-57). If compatible, they are to be facilitated on refuges. These uses will be conducted to provide compatible educational and recreational opportunities for visitors to enjoy the resources and to gain understanding and appreciation for fish and wildlife and habitats, ecology and wildlife management. These uses provide opportunities for visitors to relax and enjoy wildlife in a wholesome, safe, unstructured outdoor environment at their own pace, and to provide the psychological and health benefits attendant to that type of outdoor enjoyment. As visitors enjoy the recreational aspects of these activities, they may be drawn to engage in the more structured educational opportunities offered, and thereby enhance their understanding of natural resource management programs and ecological concepts. This, in turn, will enable them to better understand ecological issues and problems affecting refuge resources and become better advocates and stewards for those resources. Photographs that are taken on refuges are sometimes shared with others by the photographer or shared with the refuge staff and donated for use in U.S. Fish and Wildlife Service (Service) outreach materials and can provide the public increased exposure to refuge assets.

AVAILABILITY OF RESOURCES:
Sufficient refuge resources in terms of personnel and budget are available to administer these uses.

Cost Breakdown:
The following are estimated costs to the refuge to administer and manage the refuge programs for wildlife observation, wildlife photography, environmental education, and interpretation.

Maintenance:	$500	annually to maintain water levels and dike
Install kiosk and signs:	$1,500	one-time expense
Monitoring:	$600	annually
Law Enforcement:	$1,000	annually
Total	**$3,600**	

ANTICIPATED IMPACTS OF THE USE:
Wildlife observation and photography, environmental education, and interpretation can have positive or negative impacts on the WPA's wildlife and habitats.

In general, visitors engaged in these uses will be traveling by foot, either by walking or hiking, in designated areas and along designated trails and roads. The positive impacts of these uses include providing visitors with a better appreciation and more complete understanding of the wildlife and habitats associated with the refuge. This can translate into more widespread and stronger support for the refuge, the National Wildlife Refuge System, and the Service, as well as wildlife conservation in general.

The negative effects of these uses include impacts to plants, soils, hydrology, and wildlife from both visitors walking and hiking on the WPA and from building and maintaining public use facilities.

Vegetation Impacts:
Pedestrian travel can have indirect impacts to plants by compacting soils and diminishing soil porosity, aeration, and nutrient availability that affect plant growth and survival (Kuss 1986). Hammitt and Cole (1998) note that compaction limits the ability of plants to re-vegetate affected areas. Repeated foot travel can directly impact plants by crushing the plants themselves. Rare plants with limited site occurrence are particularly susceptible to such impacts. Plants growing in wet or moist soils are the most sensitive to disturbance from trampling effects (Kuss 1986). Moist and wet soil conditions are present at the refuge, particularly during spring and early summer. It is anticipated that allowing these uses could cause vegetation damage at boat put-in areas. However, these uses have been allowed at Carlton Pond WPA in the past and no significant damage has been observed.

People can be vectors for invasive plants when seeds or other propagules are moved from one area to another. Once established, invasives can out-compete native plants, thereby altering habitats and indirectly impacting wildlife. The threat of invasive plant establishment will always be an issue requiring annual monitoring, and when necessary, treatment. Staff will work to educate the visiting public to reduce introductions and will also monitor and control invasive species.

Soils Impacts:
Soils can be compacted and eroded as a result of continued use of pedestrian routes (Cole and Landres 1995). It is anticipated that some minor soil erosion will occur as a result of continuing pedestrian access on designated routes. Under current and anticipated levels of use, impacts to

soils (erosion, compaction) are not likely to be significant, because this will be an ongoing use of the refuge, and refuge staff have not observed problems with soil erosion or compaction to date.

Hydrologic Impacts:
Roads and trails can affect the hydrology of an area, primarily through alteration of drainage patterns. It is anticipated that existing roads and trails will continue to influence hydrology regardless of pedestrian travel. Maintenance will be required to create adequate and proper drainage to avoid hydrologic impacts. Trail construction may also cause erosion and run-off of sediment into nearby waterways from exposed soils.

Impacts to wet areas can occur when bridging is inadequate and visitors widen or go off the trail to avoid wet spots. Properly sited, designed, and maintained trails minimize this impact. Based on the current and projected levels of use, pedestrian travel is not likely to significantly increase erosion, incision, or stream alteration. This will be an ongoing use of the refuge, and refuge staff have not observed problems with erosion, incision, or stream alteration to date. Therefore, no significant hydrologic impacts are anticipated from this use.

Wildlife Impacts:
Disturbances vary with the wildlife species involved and the type, level, frequency, duration and the time of year such activities occur. The responses of wildlife to human activities includes: avoidance or departure from the site (Owen 1973, Burger 1981, Kaiser and Fritzell 1984, Korschen et al. 1985, Henson and Grant 1991, Kahl 1991, Klein 1993, Whittaker and Knight 1998), use of sub-optimal habitat (Erwin 1980, Williams and Forbes 1980), altered behavior or habituation to human disturbance (Burger 1981, Korschen et al. 1985, Morton et al. 1989, Ward and Stehn 1989, Havera et al. 1992, Klein 1993), attraction (Whittaker and Knight1998), and an increase in energy expenditure (Morton et al. 1989, Belanger and Bedard 1990). Knight and Cole (1991) suggest recreational activities occurring simultaneously may have a combined negative impact on wildlife. Hammitt and Cole (1998) conclude that the frequent presence of humans in wildland areas can dramatically change the normal behavior of wildlife mostly through "unintentional harassment." These responses can have negative impacts to wildlife such as mammals becoming habituated to humans making them easier targets for hunters. Human induced avoidance by wildlife can prevent animals from using otherwise suitable habitat.

Seasonal sensitivities can compound the effect of disturbance on wildlife. Examples include regularly flushing birds during nesting or causing mammals to flee during winter months, thereby consuming large amounts of stored fat reserves. Hammitt and Cole (1998) noted that females with young (such as white-tailed deer) are more likely to flee from a disturbance than those without young. Some uses, such as bird observation, are directly focused on viewing certain wildlife species and can cause more significant impacts during the breeding season and winter months.

Human disturbance to migratory birds has been documented in many studies in different locations. Conflicts arise when migratory birds and humans are present in the same areas (Boyle and Samson 1985). McNeil et al. (1992) found that many waterfowl species avoid disturbance by feeding at night instead of during the day. Flight in response to disturbance can lower nesting productivity and cause disease and death.

Studying the effects of human visitation on waterbirds at J.N. "Ding" Darling Refuge, Klein (1989) found resident waterbirds to be less sensitive to disturbance than migrants; she also found that sensitivity varied according to species and individuals within species. Herons and bitterns were quite tolerant of people; however, the presence of people did disturb these birds when hunting, terrestrial prey. Great blue herons (*Ardea herodias*), tricolored herons (*Egretta tricolor*), great egrets (*Casmerodius albus*), and little blue herons (*E. caerulea*) were disturbed to the point of flight more than other birds. Kushlan (1978) found that the need of these birds to move frequently while feeding may disrupt interspecific and intraspecific relationships. In addition, Batten (1977) and Burger (1981) found that wading birds were extremely sensitive to disturbance in the Northeastern United States.

Klein (1993), in studying waterbird response to human disturbance, found that as intensity of disturbance increased, avoidance response by the birds increased and that out-of-vehicle activity to be more disruptive than vehicular traffic; Freddy et al. (1986) and Vaske et al. (1983) also found the latter to be true. In regards to waterfowl, Klein (1989) found migratory dabbling ducks to be the most sensitive to disturbance and migrant ducks to be more sensitive when they first arrived in the late fall, than later in winter. She also found gulls and sandpipers to be apparently insensitive to human disturbance, with Burger (1981) finding the same to be true for various gull species.

For songbirds, Gutzwiller et al. (1994) found that singing behavior of some species was altered by low levels of human intrusion. Some studies have found that some bird species habituate to repeated intrusion; frequently disturbed individuals of some species have been found to vocalize more aggressively, have higher body masses, or tend to remain in place longer (Cairns and McLaren 1980). Disturbance may affect the reproductive fitness of males by hampering territory defense, male attraction, and other reproductive functions of song (Arcese 1987). Disturbance, which leads to reduced singing activity, could make males rely more heavily on physical deterrents in defending territories which are time and energy consuming (Ewald and Carpenter 1978).

Several studies have examined the effects of recreationists on birds using shallow-water habitats adjacent to trails and roads in the Eastern United States (Burger 1981, Burger 1986, Klein 1993, Burger et al. 1995, Klein et al. 1995, Rodgers and Smith 1995, 1997, Burger and Gochfeld 1998). Overall, the existing research clearly demonstrates that disturbance from recreation activities always have at least temporary effects on the behavior and movement of birds within a habitat or localized area (Burger 1981, 1986, Klein 1993, Burger et al. 1995, Klein et al. 1995, Rodgers and Smith 1997, Burger and Gochfeld 1998). The findings that were reported in these studies are summarized as follows in terms of visitor activity and avian response to disturbance.

Presence: Birds avoided places where people were present and when visitor activity was high (Burger 1981, Klein et al. 1995, Burger and Gochfeld 1998).

Distance: Disturbance increased with decreased distance between visitors and species (Burger 1986), though exact measurements were not reported.

Approach Angle: Visitors directly approaching birds on foot caused more disturbance than visitors driving by in vehicles, stopping vehicles near birds, and stopping vehicles and getting out without approaching birds (Klein 1993). Direct approaches may also cause greater disturbance than tangential approaches to birds (Burger and Gochfeld 1981, Burger et al. 1995, Knight and Cole 1995, Rodgers and Smith 1995, 1997).

Type and Speed of Activity: Joggers and landscapers caused birds to flush more than fishermen, clammers, sunbathers, and some pedestrians, possibly because the former groups move quickly (joggers) or create more noise (landscapers). The latter groups tend to move more slowly or stay in one place for longer periods, and thus birds likely perceive these activities as less threatening (Burger 1981, 1986, Burger et al. 1995, Knight and Cole 1995). Alternatively, birds may tolerate passing by with unabated speed whereas if the activity stops or slacks birds may flush (Burger et al. 1995).

Noise: Noise caused by visitors resulted in increased levels of disturbance (Burger 1986, Klein 1993, Burger and Gochfeld 1998), though noise was not correlated with visitor group size (Burger and Gochfeld 1998).

Specifically, at Carlton Pond WPA, spring or summer boating activity undertaken to observe or photograph wildlife may cause some disturbance to nesting waterfowl and shorebirds. The black tern, a State-listed endangered species, nests in the wetland vegetation near the water, so their nesting locations are monitored and water levels controlled for their benefit. In previous years, refuge staff have observed that most visitors avoid the areas where these and other waterfowl nest because of the emergent vegetation, mucky soils, and relatively shallow waters. These conditions make foot access and boat access somewhat difficult. Photographers and others will be notified with signs not to disturb these birds if needed. If disturbance becomes a productivity issue, the area close to their nests will be temporarily closed. Black ducks and other ground nesting birds are usually secreted away from areas traveled by boaters. In addition, wildlife observers and photographers generally seek to minimize disturbance as it interferes with their activity. Overall, effects should not be significant since the WPA experiences minimal public use and use is concentrated only at the launch site; there are no trails or buildings.

Summary of Impacts:
Based on observations and knowledge of the areas involved, there is no evidence that cumulatively, the proposed wildlife-dependent uses will have an unacceptable effect on the wildlife resource. Even before the establishment of the WPA, the landowners allowed the public to engage in these uses without discernible negative effects. Although a substantial increase in the cumulative impacts from public use is not expected in the near term, it will be important for refuge staff to monitor use and respond, if necessary, to conserve the existing high quality wildlife resources.

No additional effects from wildlife observation, wildlife photography, environmental education, and interpretation are anticipated. Therefore allowing these uses poses only minimal threats to goal 2 of the CCP: “Provide open water and emergent wetland habitat at the Carlton Pond WPA to sustain a diversity of wildlife, including waterfowl and species of conservation concern.” These uses help fulfill goal 5, to “Promote enjoyment and environmental stewardship by

engaging visitors, students, and nearby residents to experience the wetlands, woods, and wildlife at the Carlton Pond WPA."

PUBLIC REVIEW AND COMMENT:
As part of the comprehensive conservation plan (CCP) process for Sunkhaze Meadows National Wildlife Refuge and Carlton Pond WPA, this compatibility determination was available for public review and comment for 39 days concurrent with the release of our draft CCP and environmental assessment.

DETERMINATION (check one below):
This use is compatible __X__

This use is not compatible _____

STIPULATIONS NECESSARY TO ENSURE COMPATIBILITY:

- Refuge staff will continue to monitor the WPA for the presence of threatened or endangered species, including the state-listed black terns, and ensure that unusual or critical conditions relative to habitat or disturbance are not present. If conditions dictate, uses of all or any part of the area may be temporarily suspended by posting appropriate signs.

- Periodic law enforcement will ensure compliance with regulations and area closures and discourage prohibited activities and vandalism.

- Outside individuals, groups or organizations wishing to visit the refuge to provide environmental education or interpretation activities will be required to obtain a SUP. This will allow the refuge staff to provide important information about access, resources, and specific stipulations to reduce disturbances that may be caused by groups compared to individuals. It will also help the refuge quantify and monitor these uses on the WPA.

JUSTIFICATION:
Wildlife observation, wildlife photography, environmental education, and interpretation are priority public uses for the National Wildlife Refuge System through which the public can develop an appreciation for fish and wildlife resources (Executive Order 12996, March 25, 1996, and The National Wildlife Refuge System Administration Act of 1966, as amended by the National Wildlife Refuge System Improvement Act of 1997). The Service's policy is to provide opportunities for these uses when compatible and consistent with sound fish and wildlife management.

Allowing wildlife observation and photography, environmental education, and interpretation on Carlton Pond WPA will not materially interfere with, or detract from, the mission of the National Wildlife Refuge System of the purposes for which the WPA was established. As listed in the purposes section of this compatibility determination, the refuge was established and subsequently land was acquired for two main purposes centered around migratory birds, focusing on waterfowl. These uses do not materially interfere with or detract from these purposes because: (1) these uses occur and are expected to remain at relatively low levels, and (2) at current and

projected levels of use wildlife and habitats, including migratory birds, do not appear to be appreciably negatively affected by these uses. We have made this determination based on lack of observed habitat degradation, because disturbance to wildlife is expected to be short term, and these uses are concentrated in areas away from the sensitive nesting and feeding areas. Therefore, no significant adverse effects from wildlife observation, photography, and environmental education or interpretation are anticipated. In addition, allowing these uses supports goals and objectives as described in the refuge's CCP (USFWS 2013). These activities will not materially interfere with or detract from the mission of the Service, because providing these wildlife-dependent recreational opportunities is a focus of the National Wildlife Refuge System.

SIGNATURE:

Refuge Manager: Beth Goettel (Signature) 8/19/2013 (Date)

CONCURRENCE:

Regional Chief: Scott B. Kahn (Signature) 9/17/2013 (Date)

MANDATORY 15 YEAR RE-EVALUATION DATE: 9/17/2028

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COMPATIBILITY DETERMINATION

USE: Fishing

REFUGE NAME: Carlton Pond Waterfowl Production Area

DATE ESTABLISHED: November 24, 1965

ESTABLISHING AUTHORITIES:
Carlton Pond Waterfowl Production Area (WPA) was authorized by administrative action on July 15, 1964. The WPA was officially established when the first parcel was acquired on November 24, 1965. It was established under the following legislative authorities:

1. Migratory Bird Hunting and Conservation Stamp Act of 1934 (16 U.S.C. 718c)

2. Migratory Bird Conservation Act of 1929 (16 U.S.C. 715d)

PURPOSE(S) FOR WHICH ESTABLISHED:

1. "…as Waterfowl Production Areas" subject to "…all the provisions of such Act [Migratory Bird Conservation Act] …except the inviolate sanctuary provisions…" ((16 U.S.C. 718c) (Migratory Bird Hunting and Conservation Stamp Act)).

2. "…for any other management purpose, for migratory birds." ((16 U.S.C. 715d) (Migratory Bird Conservation Act)).

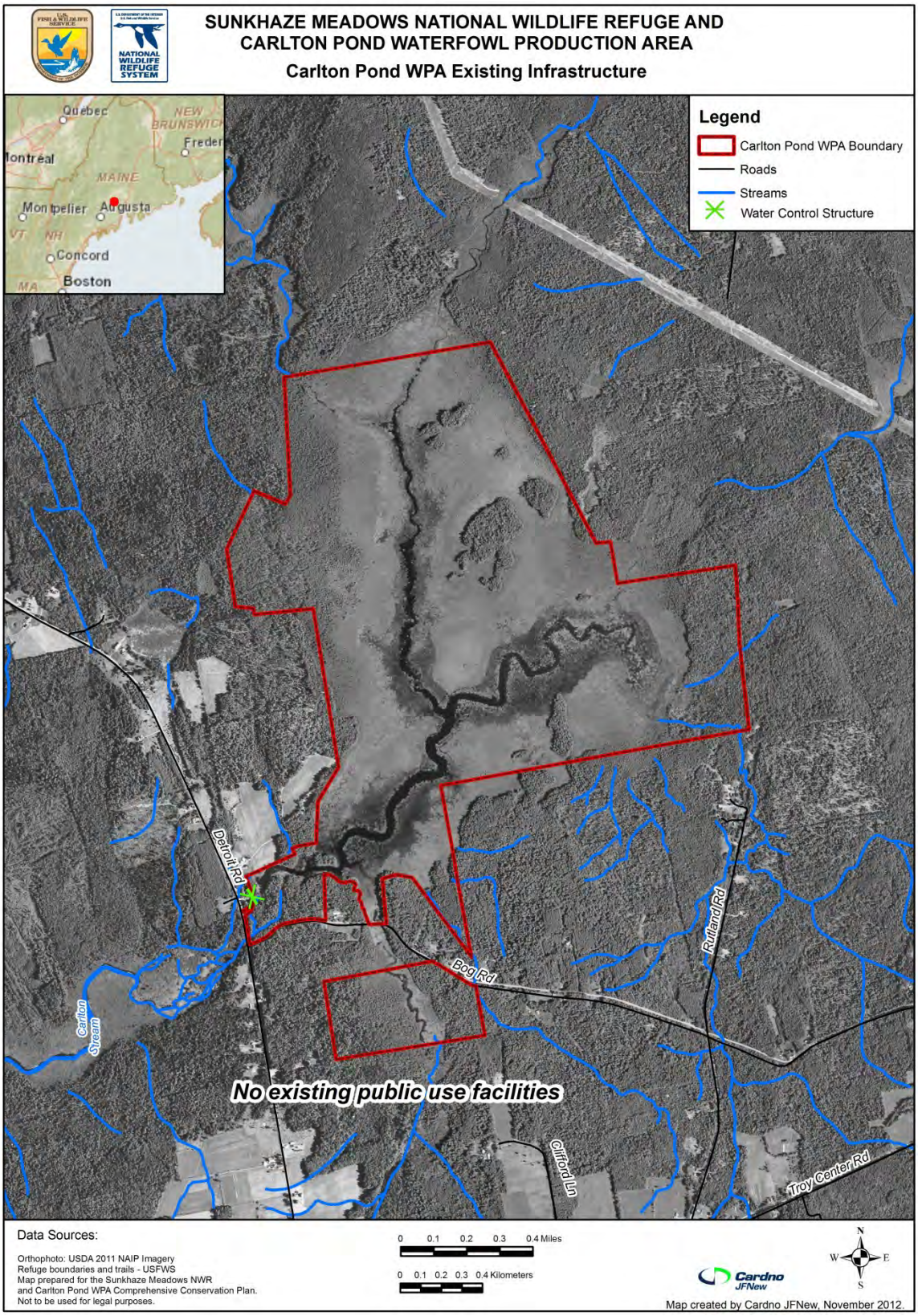
MISSION OF THE NATIONAL WILDLIFE REFUGE SYSTEM:
"To administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans." (16 U.S.C. 668dd-668ee) (National Wildlife Refuge System Administration Act of 1966)

DESCRIPTION OF USE:
(a) What is the use? Is the use a priority public use?
The use is access to recreational fishing at Carlton Pond WPA. Public fishing is a priority public use of the National Wildlife Refuge System under the National Wildlife Refuge System Administration Act of 1966, as amended by the National Wildlife Refuge System Improvement Act of 1997 (Public Law 105-57).

(b) Where will the use be conducted?
Fishing will be allowed throughout the waterways within Carlton Pond WPA during regular open hours (see map B.27).

(c) When will the use be conducted?
The use will be conducted during the seasons specified in the fishing regulations of the State of Maine. Visitors will be allowed to access to Carlton Pond on foot through the refuge between sunrise and sunset, normal refuge open hours.

Map B.27. U.S. Fish and Wildlife Service lands and waters open to compatible public uses within Carlton Pond WPA (see text for details).



(d) How will the use be conducted?

Carlton Pond WPA is open to fishing in accordance with 50 CFR 32.4. Visitors participating in this approved public use are allowed off-trail; however, off-trail use is limited to pedestrian access only (e.g., walking). Fishing may be conducted by boat or from the bank. Bank fishing may occur around the culvert on the Bog Road and near the dam. Fish species usually sought are pickerel, yellow perch, bullheads, and smallmouth and largemouth bass.

Refuge staff will continue to monitor the WPA for the presence of threatened or endangered species and ensure that unusual or critical conditions relative to habitat or wildlife are not present. If such conditions so dictate, uses of all or any part of the area may be temporarily suspended by posting in accordance with 50 CFR 31.16, 32.1, and 32.4. The refuge manager may, upon annual review of the fishing program, impose further restrictions on fishing or recommend that some or all fishing on the WPA be closed. We will restrict fishing if it becomes inconsistent with other, higher priority refuge programs or endangers WPA resources or public safety.

Fishing will be conducted under Maine State fishing regulations for open water and ice fishing, with some additional restrictions discussed below, to protect fish, wildlife, and habitat, and to reduce potential public use conflicts. A valid State of Maine fishing license will be required to fish on Carlton Pond WPA. Visitors fishing from boats will be required to comply with all conditions and stipulations in the WPA's compatibility determination for boating.

No fish of any species may be introduced into WPA waters without appropriate State and refuge permits. This includes unused bait fish and eggs. Bait fish may be trapped by State regulation from Carlton Pond's waters for personal use, but not for commercial purposes.

At the discretion of the refuge manager, some Service lands may be seasonally, temporarily, or permanently closed to fishing access, if wildlife or habitat impacts or user conflicts become an issue. In cooperation with State fisheries biologists, we may manipulate the fisheries and habitat to promote or improve the fishery resource, if warranted. That may include changing fishing regulations (season dates, creel limits, methods of take), introducing or removing fish barriers, and designating riparian buffers.

Additional specifics on how fishing will be implemented on the refuge are included in the refuge's public fishing plan. Staff are currently revising the plan, and intend to complete revisions within 5 years of CCP approval.

(e) Why is the use being proposed?

Carlton Pond WPA has been opened to fishing since its establishment in 1965. As stated previously, WPAs are open to fishing in accordance with 50 CFR 32.4. Fishing is also one of the priority uses of the Refuge System. The Service supports and encourages priority public uses on Service lands where appropriate and compatible. Fishing is also a traditional form of wildlife-oriented recreation. The 2011 national survey of fishing, hunting, and wildlife-associated recreation reveals that 341,000 Maine residents and nonresidents 16 years old and older participated in fishing (USFWS 2011).

AVAILABILITY OF RESOURCES:
Additional fiscal resources to conduct this activity will be minimal since Carlton Pond WPA has been opened to public fishing since its establishment in 1965, and will occur under State regulations and not as a refuge-regulated fishing program. Costs associated with administration of this use include:

Public Informational Signage:	$300
GS-9 Refuge Officer	
Law Enforcement/Outreach:	$1,000
Total:	**$1,300**

Based on a review of the budget allocated for public fishing management, we have determined that sufficient resources are available to continue the existing fishing program. Our existing staff and budget should provide sufficient resources to continue managing this activity.

ANTICIPATED IMPACTS OF THIS USE:
Fishing is consistent with the purposes of Carlton Pond WPA when it is carried out within established regulations and is a priority use of the Refuge System.

Impacts on Fish Species:
Recreational fishing can have negative impacts on fish populations if it occurs at high levels or is not managed properly. Potential impacts from fishing include direct mortality from harvest and catch and release; injury to fish caught and released, changes in age and size class distribution, changes in reproductive capacity and success, loss of genetic diversity, altered behavior, and changes in ecosystems and food webs (Lewin et al. 2006, Cline et al. 2007).

These impacts are often disproportionate among fish species, sizes, ages, sexes, and based on other behavioral traits because anglers selectively catch fish based on these factors (Lewin et al. 2006). In general, anglers tend to target larger and older fish. The selective removal of larger and older fish can have a variety of impacts of fish population dynamics. First, it can decrease the age and size class distribution in fish populations. Second, larger and older fish tend to have greater reproductive capacity because they are better able to compete for spawning areas and generally have higher egg outputs. Because of this, their selective removal may reduce the populations overall reproductive success. Depending upon the species, anglers may also be more likely to catch males (e.g., some male largemouth bass are more aggressive towards lures) or females (e.g., in some species females grow faster). Also, fish that are more active during the day are often more vulnerable to being caught (Lewin et al. 2006).

Catch-and-release fishing can also have impacts on individual fish, including immediate or delayed mortality. The likelihood of mortality is related to the type of fishing gear used, where the fish is hooked, how the fish is handled, angler experience, and environmental conditions. In general, circle hooks tend to cause less damage than barbed hooks. Also, fish hooked in the lips or jaws tend to have minimal mortality as compared to fish hooked in the gills, esophagus, intestine, or eyes. Fish caught and released with nonlethal injuries may also be exposed to parasites, or bacterial or fungal infections. Individuals that are caught and then handled may also

experience stress, which can lead to changes in physiology and behavior which can in turn impact their growth, reproduction, and immune system (Lewin et al. 2006).

Since fishing generally removes individuals from a population, at high levels it can lead to reduced population sizes and loss of genetic diversity. The loss of genetic diversity can ultimately reduce a population's fitness, resilience, and ability to adapt to environmental changes and stressors, such as climate change. The higher the fishing mortality, the greater these types of impacts will be (Lewin et al. 2006).

While fishing does remove individuals from the population, we do not anticipate that current or projected fishing pressure will affect the WPA's fish populations as a whole. The State sets catch limits, designated waters, and fishing seasons to protect the State's fish populations. As a shallow water impoundment, Carlton Pond is dominated by common, warm water species. In addition, there are no known federally listed or State-listed fish species in WPA waters. As stated previously, fish species usually sought are chain pickerel, yellow perch, bullheads, and smallmouth and largemouth bass. While popular with anglers, smallmouth and largemouth bass are not native to Maine (MDIFW 2001). According to Maine Department of Inland Fisheries and Wildlife (MDIFW), there has been an increase of 47 percent in the number of lakes with one or more species of bass between 1980 and 2000 (MDIFW 2001). Chain pickerel are thought to be native only to southern Maine, and are therefore not considered native to Carlton Pond WPA (MDIFW 2008). Based on the MDIFW (2008) assessment, abundance of chain pickerel is increasing; and, despite State efforts to limit the distribution of pickerel, the species distribution is also increasing (MDIFW 2008). Bullhead and yellow perch are also considered to be nonnative to Carlton Pond WPA (MDIFW 2002). Both species are widely distributed throughout the State, and fishery managers have made efforts to reduce their range to reduce competition with native species such as brook trout (MDIFW 2002). We do not have abundance estimates specifically for Carlton Pond WPA waters; however, given the distribution of these species and the State's estimates of abundance, we do not expect fishing pressure at Carlton Pond WPA to have adverse effects on these species.

Illegal take can also impact fish populations. Periodic patrol by our refuge officer in cooperation with Maine State game wardens will help reduce illegal take.

Impacts on Other Wildlife:
Fishing has the greatest potential to impact aquatic and semi-aquatic species in WPA fishing areas. In particular, fishing has the potential to disturb waterfowl and waterbird species. Fishing seasons in Maine coincide in part with spring-early summer nesting and brood-rearing periods for many species of aquatic-dependent birds. Anglers can also affect the number, behavior, and temporal distribution of some species of birds, including bald eagles, common ravens, and American crows (Knight et al. 1991). Human activity, including both walking and boat use, has the potential to affect the distribution, abundance, and species richness of water birds by disturbing birds that are overwinter, resting, foraging, reproducing, and nesting.

Disturbances from recreational activities vary with the wildlife species involved and the activity's type, level, frequency, duration, and the time of year it occurs. The responses of wildlife to human activities include avoidance or departure from the site (Owen 1973, Burger

1981, Kaiser and Fritzell 1984, Korschen et al. 1985, Kahl 1991, Klein 1993, Whittaker and Knight 1998), the use of suboptimal habitat (Erwin 1980, Williams and Forbes 1980), altered behavior or habituation to human disturbance (Burger 1981, Korschen et al. 1985, Morton et al. 1989, Ward and Stehn 1989, Havera et al. 1992, Klein 1993, Whittaker and Knight 1998), attraction (Whittaker and Knight1998), and an increase in energy expenditure (Morton et al. 1989, Belanger and Bedard 1990). Anglers may disturb nesting birds by approaching too closely to nests, causing nesting birds to flush. Flushing may expose eggs to predation or cooling, resulting in egg mortality. This is unlikely as birds nesting and rearing areas are difficult to access on land because of marsh conditions. If disturbance from anglers becomes a problem we will close refuge areas seasonally to fishing around sensitive nest sites, in conjunction with the State of Maine, if necessary.

Visitors to the refuge engaged in fishing will generally be walking across refuge lands to reach the pond. Several studies have examined the effects of recreationists on birds using shallow-water habitats adjacent to trails and roads through wildlife refuges and coastal habitats in the Eastern United States (Burger 1981, Burger 1986, Klein 1993, Klein et al. 1995, Rodgers and Smith 1995, Rodgers and Smith 1997, Burger and Gochfeld 1998). Overall, the existing research clearly demonstrates that disturbances from recreation activities have at least temporary effects on the behavior and movement of birds within a habitat or localized area.

Lost fishing tackle may harm waterfowl, eagles, and other birds externally by catching and tearing skin. Fishing line may also become wrapped around body parts and hinder movement (legs, wings), impair feeding (bill), or cause constriction with subsequent reduction of blood flow and tissue damage. An object above or below the water surface may snag entangled animals, from which they are unable to escape. Nineteen percent of loon mortalities in Minnesota were attributed to entanglement in fishing line (Ensor et al. 1992). Entanglement in fishing line has also caused mortality in bald eagles. Birds may also ingest sinkers, hooks, floats, lures, and fishing line. Ingested tackle may cause damage or penetration of the mouth or other parts of the digestive tract, resulting in impaired function or death. Lead tackle is particularly toxic to wildlife. An investigation into causes of mortality in loons in New England found 52 percent of loon carcasses submitted to Tufts University Wildlife Clinic had died of lead poisoning from ingestion of lead sinkers (Pokras and Chafel. 1992). Maine law prohibits the sale of lead sinkers that weigh less than 0.5 ounces (Maine Title 12, part 13, subpart 4, chapter 923, subchapter 5, 12663-A). Because of the threat of lead poisoning to waterbirds from ingestion of lead sinkers, we prohibit the use of any lead fishing sinkers or jigs on the WPA. There have not been many cases of wildlife loss due to lost fishing gear on the WPA; however, the refuge and the State will continue to provide education and outreach on the hazards of lead sinkers and discarded fishing tackle. Our refuge officer will help in that public outreach.

Water Quality Impacts:
Pollutants from human waste and litter have the potential to have negative impacts on water quality. Extensive water quality testing on Carlton Pond and its tributaries has not been carried out. As such, impacts on local aquatic systems are unknown. We will initiate public outreach and education on littering, pollutants, and proper waste disposal if the use increases substantially above current use levels to help mitigate water quality impacts. Water quality testing will be carried out as funding levels permit.

Bank erosion from human activity (foot traffic) may increase aquatic sediment loads of ponds, or alter riparian vegetation in ways harmful to fish or other wildlife. We do not intend to construct any new trails or boardwalks to provide shore-based fishing access. Therefore, there may be minor impacts associated with the transportation of fishing equipment to the shoreline, especially the heavy equipment used for ice fishing. However, we believe effects of this use on soil erosion and vegetation will be minor for the following reasons. First, effects on soil erosion and vegetation trampling associated with current and projected levels of ice fishing are expected to be minimal since this activity occurs in winter months, when the ground is frozen and vegetation is generally dormant. During other times of year, most anglers appear to access the pond using non-motorized boats, which also minimizes potential impacts of soil erosion and vegetation trampling. Lastly, fishing has been an authorized public use at the WPA for many years, and Service staff are unaware of any bank erosion or vegetation trampling issues associated with fishing at Carlton Pond WPA. Therefore, at current and projected levels of use we expect only minor adverse impacts to soil or vegetation from foot traffic related to fishing.

Other Impacts:
Accidental or deliberate introductions of nonnative fish that may negatively impact native fish, wildlife, or vegetation. The refuge will continue to work cooperatively with the State in providing educational outreach and signs on preventing introductions of nonnative fish and try to contain introductions if they occur.

Accidental introduction of invasive plants, pathogens, or exotic invertebrates, attached to fishing boats may also impact native vegetation, wildlife, and habitats. With the exception of a few isolated occurrences of purple loosestrife, WPA waters appear to be relatively free of invasive aquatic plants and mollusks. However, we have not carried out extensive surveys of aquatic invasives. We can mitigate the potential for introductions by having boaters clean their boats before launching and after retrieving. We will also post launch sites with educational materials and have law enforcement officers make spot checks of vessels for compliance and to educate boaters on proper methods for checking for aquatic hitchhikers.

There may be some conflicts between anglers and birders. If other conflicts should arise, the refuge may need to place additional constraints on public uses to minimize conflicts. Management actions may include, but are not limited to: education and outreach, zoning (in space and/or time), and separating user groups.

PUBLIC REVIEW AND COMMENT:
As part of the comprehensive conservation plan (CCP) process for Sunkhaze Meadows National Wildlife Refuge and Carlton Pond WPA, this compatibility determination was available for public review and comment for 39 days concurrent with the release of our draft CCP and environmental assessment.

DETERMINATION (check one below):
This use is compatible __X__

This use is not compatible _____

STIPULATIONS NECESSARY TO ENSURE COMPATIBILITY:

- We will manage the public fishing program in accordance with Federal and State regulations and review it annually to ensure that wildlife and habitat management goals are achieved and that the program is providing a safe, high-quality outdoor experience for participants. Therefore, adherence to the regulations stated herein will ensure compatibility with the purpose for which the refuge was established.

- All boats, trailers, motors, and fishing gear will be encouraged to be inspected by the owner for plant material and cleaned prior to launching and after retrieval.

- Compliance with regulations will be achieved through education, posted signs, and law enforcement which will result in minimizing negative impacts to refuge habitat and wildlife. Individuals fishing in Carlton Pond WPA are subject to the inspection of licenses, fishing equipment, fish creels and containers, vehicles, and their contents by Federal or State officers.

- No commercial fishing or collecting bait for commercial purposes will be allowed.

- Maine law prohibits the sale of lead sinkers weighing less than 0.5 ounces (Maine Title 12, part 13, subpart 4, chapter 923, subchapter 5, 12663-A). Use of any lead fishing sinkers or jigs is prohibited on the WPA.

- The WPA will be open to fishing during regular WPA open hours, sunrise to sunset.

JUSTIFICATION:

Fishing is a priority public use for the National Wildlife Refuge System through which the public can develop an appreciation for fish and wildlife resources (The National Wildlife Refuge System Administration Act of 1966, as amended by the National Wildlife Refuge System Improvement Act of 1997). The Service's policy is to provide opportunities for this use when compatible and consistent with sound fish and wildlife management. Fishing is also a popular, traditional recreation activity in Maine that is strongly supported by the Maine Department of Inland Fisheries and Wildlife.

Allowing fishing on Carlton Pond WPA will not materially interfere with, or detract from, the mission of the National Wildlife Refuge System of the purposes for which the WPA was established. As listed in the purposes section of this compatibility determination, the refuge was established and subsequently land was acquired for two main purposes centered around migratory birds, with a focus on migratory waterfowl. This use does not adversely impact these purposes because: (1) these uses occur and are expected to remain at relatively low levels, and (2) at current and projected levels of use wildlife and habitats, including migratory birds, do not appear to be appreciably negatively affected by this use. We have made this determination based on lack of observed habitat degradation, because disturbance to wildlife is expected to be short term, and these uses are concentrated in areas away from the sensitive nesting and feeding areas. Therefore, no significant adverse effects from fishing are anticipated. In addition, allowing these

uses supports CCP goals and objectives as described in the refuge's CCP (USFWS 2013). These activities will not materially interfere with or detract from the mission of the Service, because providing these wildlife-dependent recreational opportunities is a focus of the National Wildlife Refuge System.

SIGNATURE:

Refuge Manager: Beth Goettel (Signature) 8/19/2013 (Date)

CONCURRENCE:

Regional Chief: (Signature) 9/17/2013 (Date)

MANDATORY 15 YEAR RE-EVALUATION DATE: 9/17/2028

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COMPATIBILITY DETERMINATION

USE: Hunting

REFUGE NAME: Carlton Pond Waterfowl Production Area

DATE ESTABLISHED: November 24, 1965

ESTABLISHING AUTHORITIES:
Carlton Pond Waterfowl Production Area (WPA) was authorized by administrative action on July 15, 1964. The WPA was officially established when the first parcel was acquired on November 24, 1965. It was established under the following legislative authorities:

1. Migratory Bird Hunting and Conservation Stamp Act of 1934 (16 U.S.C. 718c)

2. Migratory Bird Conservation Act of 1929 (16 U.S.C. 715d)

PURPOSE(S) FOR WHICH ESTABLISHED:

1. "…as Waterfowl Production Areas" subject to "…all the provisions of such Act [Migratory Bird Conservation Act] …except the inviolate sanctuary provisions…" ((16 U.S.C. 718c) (Migratory Bird Hunting and Conservation Stamp Act)).

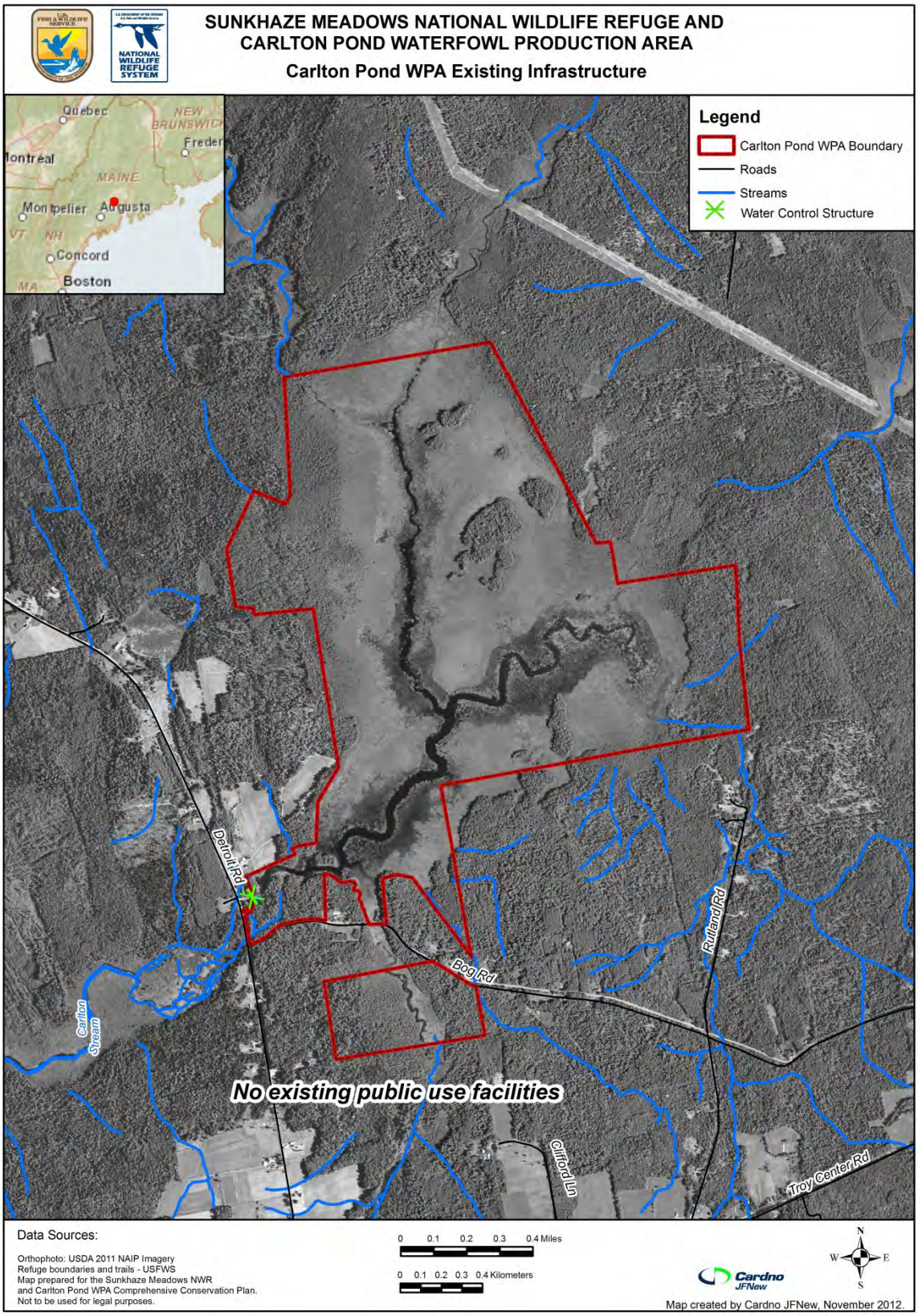
2. "…for any other management purpose, for migratory birds." ((16 U.S.C. 715d) (Migratory Bird Conservation Act)).

MISSION OF THE NATIONAL WILDLIFE REFUGE SYSTEM:
"To administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife and plant resource and their habitats within the United States for the benefit of present and future generations of Americans." (16 U.S.C. 668dd-668ee) (National Wildlife Refuge System Administration Act of 1966)

DESCRIPTION OF USE:
(a) What is the use? Is the use a priority public use?
The use is hunting by the public. Hunting is a priority public use of the National Wildlife Refuge System under the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd-668ee), and the National Wildlife Refuge System Improvement Act of 1997 (Refuge Improvement Act; Public Law 105-57). Per 50 CFR 32.1, "Lands acquired as 'waterfowl production areas' shall annually be open to the hunting of migratory game birds, upland game, and big game subject to the provisions of State law and regulations and the pertinent provisions of 50 CFR parts 25 through 31 of this subchapter: *Provided*, That all forms of hunting or entry on all or any part of individual areas may be temporarily suspended by posting upon occasions of unusual or critical conditions of, or affecting land, water, vegetation, or wildlife populations."

(b) Where will the use be conducted?
Hunting will be allowed on Carlton Pond WPA which is located in the town of Troy, Waldo County, Maine (map B.28).

Map B.28. Service lands and waters open to compatible public uses within Carlton Pond WPA (see text for details).



(c) When will the use be conducted?
Hunting will be conducted during State of Maine seasons for big game, upland game, and migratory bird hunting seasons, and will be in accordance with Federal and State regulations. In cooperation with the State, hunt season dates and bag limits may be adjusted in the future as needed to achieve balanced wildlife population levels and to limit conflicts with other user groups.

(d) How will the use be conducted?
The refuge permits hunting in accordance with State and Federal guidelines. Per 50 CFR 32.1, all forms of hunting on all or any part of Carlton Pond WPA may be temporarily suspended by posting upon occasions of unusual or critical conditions of, or affecting land, water, vegetation, or wildlife populations. Visitors participating in approved public uses are allowed off-trail; however, off-trail use is limited to pedestrian access only (i.e., walking).

(e) Why is the use being proposed?
Hunting is one of the priority uses outlined by Congress in the Refuge Improvement Act of 1997. The Service supports and encourages priority uses on national wildlife refuge lands where appropriate and compatible. According to Federal regulations, waterfowl production areas "shall annually be open to the hunting of migratory game birds, upland game, and big game…" subject to the provisions of State and Federal laws and regulations..." (50 CFR 32.1)

AVAILABILITY OF RESOURCES:
Additional fiscal resources to conduct this activity will be minimal as Carlton Pond WPA has been open to hunting since 1965 and since hunting will continue to occur under State regulations and not as a refuge regulated hunting program. Costs associated with administration of this use include:

Preparation of Annual Hunt Plan:	$500	GS-11 Wildlife Biologist GS-12 Deputy Refuge Manager
Preparation and Updating of Refuge Hunting Brochure:	$300	GS-12 Deputy Refuge Manager GS-9 Refuge Officer
Dispensing Information during year:	$200	GS-6 Administrative Assistant
Law Enforcement/Outreach:	$3,000	GS-9 Refuge Officer
Total:	**$4,000**	

Based on a review of the budget allocated for hunting management, funding is adequate to ensure compatibility, administer, and manage the recreational use listed. Sufficient resources are available to continue the existing hunting program. Our existing staff and budget have provided sufficient resources to continue current management.

ANTICIPATED IMPACTS OF THE USE:
Wildlife Impacts – Migratory Game Bird Species:
While individual birds are harvested as part of the WPA's hunt program, because of the Service's and the State's efforts to monitor and regulate harvest of these species, we do not

expect adverse impacts at the population level from harvesting these species. Additional information on harvests and efforts to manage these species follows.

Waterfowl
Adverse effects on waterfowl populations are not expected because of the hunting regulations and bag limits that have been set in place by the Federal and State agencies (USFWS Migratory Bird Office and the Maine Department of Inland Fisheries and Wildlife (MDIFW)) that manage the harvest of waterfowl populations. Significant conservation measures and extensive pre- and post-season population monitoring and the institution of Adaptive Harvest Management are safeguards inherent in waterfowl management. Adverse effects on other game species are not expected, because hunting will occur under state regulations. The MDIFW sets harvest limits that take into account game species population data collected by State biologists and wildlife species assessments.

Woodcock
Restrictive hunting regulations have been in effect for American woodcock since 1985 when surveys indicated a decline in numbers since the 1960's. The Service and State agencies monitor the population closely through a Migratory Bird Harvest Information Program (HIP) and also spring singing male counts (SGS) throughout the birds range.

Based on data from the HIP, 7,100 woodcock hunters harvested 31,700 woodcock in Maine last year. The long-term trend (1968 to 2011) indicates a decline in woodcock numbers across their range; however, 2011 is the 8th year in a row that the population appears stable. In 2011, the number of males heard on SGS routes (3.58) was slightly higher than last year (3.41) and was above the 10-year average of 3.42. (MDIFW 2011a)

Effects on Wildlife - Resident Mammals:
The MDIFW is responsible for the management of resident wildlife including game mammal species. They use a variety of methods to assess population levels and develop harvest strategies. While individual mammals are harvested as part of the refuge's hunt program, because of the State's efforts to monitor and regulate harvest of resident mammal species, we do not expect adverse impacts at the population level from harvesting these species. Additional information on harvests and State efforts to manage game species follows.

White-tailed Deer
During 2011, 198,107 deer hunting licenses were sold in Maine with hunter densities averaging about seven per square mile. Statewide these hunters spent an estimated 1.08 million hunter days effort pursuing deer during Maine's 79 day deer hunting season. Deer hunting success was estimated at 11 percent in 2011 with 18,784 deer harvested. Wildlife Management District (WMD) 23, which includes Carlton Pond WPA, had 1,657 deer harvested.

Moose
The annual allocation of moose permits is a function of specific management goals for each WMD. Permits were awarded to applicants by a computerized lottery with 49,889 applying for 3,903 permits. In 2011, 2,582 moose were checked into station with 2 moose harvested in the

WMD which includes Carlton Pond WPA. Statewide the success rate for last year's hunt was 79 percent which is equal to the average success rate for the last 9 years. Aerial surveys are conducted in nine WMDs to count the number of bulls, cows, and calves. Based on these surveys the State estimates the statewide moose population to be 76,000. These surveys combined with data collected on female moose reproduction, survival rates obtained by aging teeth and hunter sight-rate data, MDIFW ensures harvest is in keeping with a healthy moose population.

Black Bear

The forests of Maine support the largest black bear population in the Eastern United States. For more than 35 years, MDIFW has closely monitored bears to ensure their management decisions are based on current and sound information. Harvest levels are determined based on harvest data and samples of teeth collected which help to show population trends and the number of bears present in the population.

The State regulates harvest by setting season length, bag limit, and legal methods of hunting. Most bears are harvested by hunting over bait (75 percent), 12 percent using dogs, 6 percent by deer hunters, 4 percent by still hunting[2], and 3 percent in traps. The total harvest in 2011 was 2,400 with 8 taken in the WMD that includes Carlton Pond WPA. No baiting is allowed on the WPA which reduces harvest as compared to surrounding areas.

Furbearers and Small Mammals

In Maine many mammals are harvested for their pelt value. Many of the species are harvested by trapping but the following are also hunted: coyote, bobcat, raccoon, skunk, snowshoe hare, gray squirrel, woodchuck, porcupine, and red squirrel.

Currently the State's coyote population is between 10,000 to 12,000 in the winter and increases to 19,000 in spring. This number decreases due to the low number of pups that survive after birth. The coyote population will likely remain relatively constant unless wolves reestablish themselves in the State and then it is believed the coyote population will drastically decline (Jakubas 1999). The coyote population in Maine has been the center of controversy in recent years because of its potential role in affecting deer populations. There is a desire by some public to control or eliminate coyote populations. However, hunting and trapping has been shown to have little effect in determining Statewide population levels. There will need to be mortality rates greater than 70 percent for there to be a reduction in the population (Jakubas 1999). In 2011, 1,623 coyotes were taken in Maine through hunting and trapping.

The red fox population is distributed Statewide (Caron 1986) and is currently considered to be abundant and stable (Jakubas 2004). Red fox are hunted but most of the take for this species is through trapping. Harvests across the State in 2011 through trapping and hunting totaled 922.

The bobcat is a trapped and hunted species that is distributed over most of the State (Morris 1986). The Bobcat Management System is used to manage bobcat populations in the State (McLaughlin 1995). The number of bobcat harvested in 2011 through trapping and hunting was 305.

[2] Rather than being completely 'still,' still hunters move slowly, deliberately, and quietly through the habitat looking for tracks, movement, fur, or other signs of the animal.

Population trends for the stripped skunk, porcupine, and woodchuck are unknown according to the state of Maine since harvests are not recorded. However, these species are commonly seen on the refuge, the WPA, and throughout the State.

Human Disturbance Effects:
Hunting can have direct and indirect impacts on both target and non-target species. These impacts include direct mortality of individuals; changes in wildlife behavior; changes in wildlife population structure, dynamics, and distribution patterns; and disturbance from noise and hunters walking on- and off-trail (Cole and Knight 1990, Cole 1995, Bell and Austin 1985). In many cases, hunting removes a portion of the wildlife population that will otherwise naturally succumb to predation, disease, or competition (Bartmann et al. 1992). Typical changes in deer behavior in response to hunting include avoidance of certain areas, becoming more wary, staying closer to cover, and shifting feeding times (e.g., feeding more at night) (King and Workman 1986). For waterfowl species, hunting may also make them more skittish and prone to disturbance, reduce the amount of time they spend foraging and resting, alter their habitat usage patterns, and disrupt their pair and family bonds (Raveling 1979, Owen 1977, White-Robinson 1982, Madsen 1985, Bartelt 1987).

In general, visitors to the WPA engaged in hunting will be walking off-trail in designated areas open to hunting. General disturbances from recreational activities, including hunting, vary with the wildlife species involved and the activity's type, level, frequency, duration, and the time of year it occurs. The responses of wildlife to human activities, such as hunting, include avoidance or departure from the site (Owen 1973, Burger 1981, Kaiser and Fritzell 1984, Korschen et al. 1985, Kahl 1991, Klein 1993, Whittaker and Knight 1998), the use of suboptimal habitat (Erwin 1980, Williams and Forbes 1980), altered behavior or habituation to human disturbance (Burger 1981, Korschen et al. 1985, Morton et al. 1989, Ward and Stehn 1989, Havera et al. 1992, Klein 1993, Whittaker and Knight 1998), attraction (Whittaker and Knight1998), and an increase in energy expenditure (Morton et al. 1989, Belanger and Bedard 1990). The amount of disturbance tends to increase with decreased distance between visitors and birds (Burger 1986).

Some bird species flee from human disturbance, which can lower their nesting productivity and cause disease and death (Knight and Cole 1991). Miller et al. (1998) found bird abundance and nesting activities (including nest success) increased as distance from a recreational trail increased in both grassland and forested habitats. Bird communities in this study were apparently affected by the presence of recreational trails, where common species (i.e., American robins) were found near trails and more specialized species (i.e., grasshopper sparrows) were found farther from trails. Nest predation also was found to be greater near trails (Miller et al. 1998). Disturbance may affect the reproductive fitness of males by hampering territory defense, male attraction and other reproductive functions of song (Arcese 1987). Disturbance, which leads to reduced singing activity, makes males rely more heavily on physical deterrents in defending territories, which are time- and energy-consuming (Ewald and Carpenter 1978).

Seasonal sensitivities can compound the effect of disturbance on wildlife. Examples include regularly flushing birds during nesting or causing mammals to flee during winter months, thereby consuming large amounts of stored fat reserves. Hammitt and Cole (1998) note that females with young (such as white-tailed deer) are more likely to flee from a disturbance than those without young.

The hunt at Carlton Pond has been conducted since 1990 with no significant disturbance noted due to this use. This is largely due to the small numbers of hunters participating in the hunt dispersed over a large area. The hunting takes place outside of the migratory bird nesting period further minimizing the potential effects.

Effects on Vegetation:
The physical effects on vegetation from hunting various game species on the WPA are expected to be minimal. All-terrain vehicles will not be allowed on the WPA. Other vehicles are restricted to designated roadways. Hunter use is generally dispersed over large areas. Hunters will have little to no impact on the vegetation.

Positive, indirect effects on the vegetation could result from a reduction in the white-tailed deer population. The impacts of dense deer populations on forest regeneration and the composition and diversity of the herbaceous understory have been well documented (Tierson et al. 1966, Behrend et al. 1970, Tilghman 1989). Well-managed hunting can effectively control deer and produce dramatic changes in the forest vegetation (Behrend et al. 1970). The impact of deer hunting on the vegetation could be positive and result in better regeneration of forest canopy species and an increase in the diversity of the herbaceous understory. In summary, there will be few if any negative impacts from this use on the WPA's vegetation, but there could be beneficial impacts from the decrease of deer browse on the WPA's vegetation due to the decrease in the number of deer on Service lands.

Possible negative cumulative impacts of the proposed activity include temporary trampling of vegetation and light soil erosion. Most hunting occurs during the fall and winter when the ground is either frozen, covered in snow, or when plants are dormant. For these reasons, cumulative impacts to plant communities and soils are not likely to be significant.

Effects on Soils:
It is anticipated that minor impacts to soils will occur as a result of allowing hunting access on Carlton Pond. Erosion potential will likely vary during the season based on soil moisture and temperatures. During much of the hunting season, soils may be frozen or covered in snow, thereby reducing the impacts greatly. At current and projected levels of use, we expect only minimal impacts to soils (erosion, compaction) because of the time of year, expected low numbers of hunters, and because hunters are spread out around the WPA. This will be an ongoing use of the WPA, and Service staff have observed only minor negative effects, if any, on soils associated with this use to date.

Effects on Air Quality:
Air quality and water quality impacts will be minimal and only due to WPA visitors' automobile emissions and run-off on roads and trails. These effects will not only come from hunters but from a majority of users of wildlife-dependent recreation on the WPA. Given the traditional low number of hunters the effects on overall air and water quality in the region will be negligible, compared to the effects from non-WPA sources.

Economic Effects:
The 2011 national survey of fishing, hunting, and wildlife-associated recreation reveals that 1,117,000 Maine residents and nonresidents 16 years old and older fished, hunted, or watched wildlife in Maine. Of that total, 341,000 fished, 181,000 hunted, and 838,000 participated in wildlife watching activities, including observing, feeding, and photographing wildlife (USFWS 2011). While we do not have exact numbers of hunters on the WPA, visitors participating in this use provided some economic benefit to the local economy by purchasing goods and services (e.g., food, lodging, gas) in and around the area.

PUBLIC REVIEW AND COMMENT:
As part of the comprehensive conservation plan (CCP) process for Sunkhaze Meadows National Wildlife Refuge and Carlton Pond WPA, this compatibility determination was available for public review and comment for 39 days concurrent with the release of our draft CCP and environmental assessment.

DETERMINATION (check one below):
This use is compatible __X__

This use is not compatible _____

STIPULATIONS NECESSARY TO ENSURE COMPATIBILITY:
The hunt program will continue to be managed in accordance with Federal and State regulations. The program will be reviewed annually to ensure that wildlife and habitat management goals are achieved and that the program is providing a safe, high quality hunting experience for participants.

- Shotgun hunters may possess only approved nontoxic shot while in the field (see 50 CFR 32.2(k)).
- All forms of hunting on all or any part of Carlton Pond WPA may be temporarily suspended by posting upon occasions of unusual or critical conditions of, or affecting land, water, vegetation, or wildlife populations (50 CFR 32.1).
- We allow eastern coyote hunting from October 1 to March 31.
- We allow bear hunting from October 1 to the end of the State-prescribed season. Per 50 CFR 32.2(h), the use of bait is prohibited during the hunting of bears or other wildlife.
- All applicable State and Federal regulations will apply.

JUSTIFICATION:
Per Federal regulations, waterfowl production areas are to be open to hunting unless temporarily closed because of “unusual or critical conditions…affecting land, water, vegetation, or wildlife populations” (50 CFR 32.1). Public hunting is also a priority public use for the National Wildlife Refuge System through which the public can develop an appreciation for fish and wildlife resources (The National Wildlife Refuge System Administration Act of 1966, as amended by the

National Wildlife Refuge System Improvement Act of 1997). The Service's policy is to provide enhanced opportunities for this use when compatible and consistent with sound fish and wildlife management. In addition, hunting is an historic use of the WPA. It is a popular, traditional recreation activity on public lands in Maine that is strongly supported by the Maine Department of Inland Fisheries and Wildlife.

Allowing hunting at the WPA will not materially interfere with, or detract from, the mission of the National Wildlife Refuge System of the purposes for which the WPA was established. As listed in the purposes section of this compatibility determination, the WPA was established and subsequently land was acquired for two main purposes related to migratory birds. As discussed under the section on anticipated impacts above, hunting is a wildlife-dependent priority public use with minimal adverse impacts on WPA resources; therefore, no significant adverse effects from public hunting are anticipated. Because of this, it is consistent with the WPA's migratory bird purposes. In fact in contrast to refuges, WPAs are open to hunting unless closed, so continuing to allow hunting supports Service regulations, the Service policy on hunting, the National Wildlife Refuge System Improvement Act of 1997, and the broad management objectives of the National Wildlife Refuge System. Allowing this use supports CCP goals and objectives as described in the WPA's CCP (USFWS 2013). This activity will not materially interfere with or detract from the mission of the Service, because providing this wildlife-dependent recreational opportunity is a focus of the National Wildlife Refuge System.

SIGNATURE:

Refuge Manager: Beth Gottel (Signature) 8/30/2013 (Date)

CONCURRENCE:

Regional Chief: Sam B. Hunt (Signature) 9/17/2013 (Date)

MANDATORY 15 YEAR RE-EVALUATION DATE: 9/17/2028

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COMPATIBILITY DETERMINATION

USE: Furbearer Management (Trapping)

REFUGE NAME: Carlton Pond Waterfowl Production Area

DATE ESTABLISHED: November 24, 1965

ESTABLISHING AUTHORITIES:
Carlton Pond Waterfowl Production Area (WPA) was authorized by administrative action on July 15, 1964. The WPA was officially established when the first parcel was acquired on November 24, 1965. It was established under the following legislative authorities:

1. Migratory Bird Hunting and Conservation Stamp Act of 1934 (16 U.S.C. 718c)

2. Migratory Bird Conservation Act of 1929 (16 U.S.C. 715d)

PURPOSE(S) FOR WHICH ESTABLISHED:

1. "…as Waterfowl Production Areas" subject to "…all the provisions of such Act [Migratory Bird Conservation Act] …except the inviolate sanctuary provisions…" ((16 U.S.C. 718c) (Migratory Bird Hunting and Conservation Stamp Act)).

2. "…for any other management purpose, for migratory birds." ((16 U.S.C. 715d) (Migratory Bird Conservation Act)).

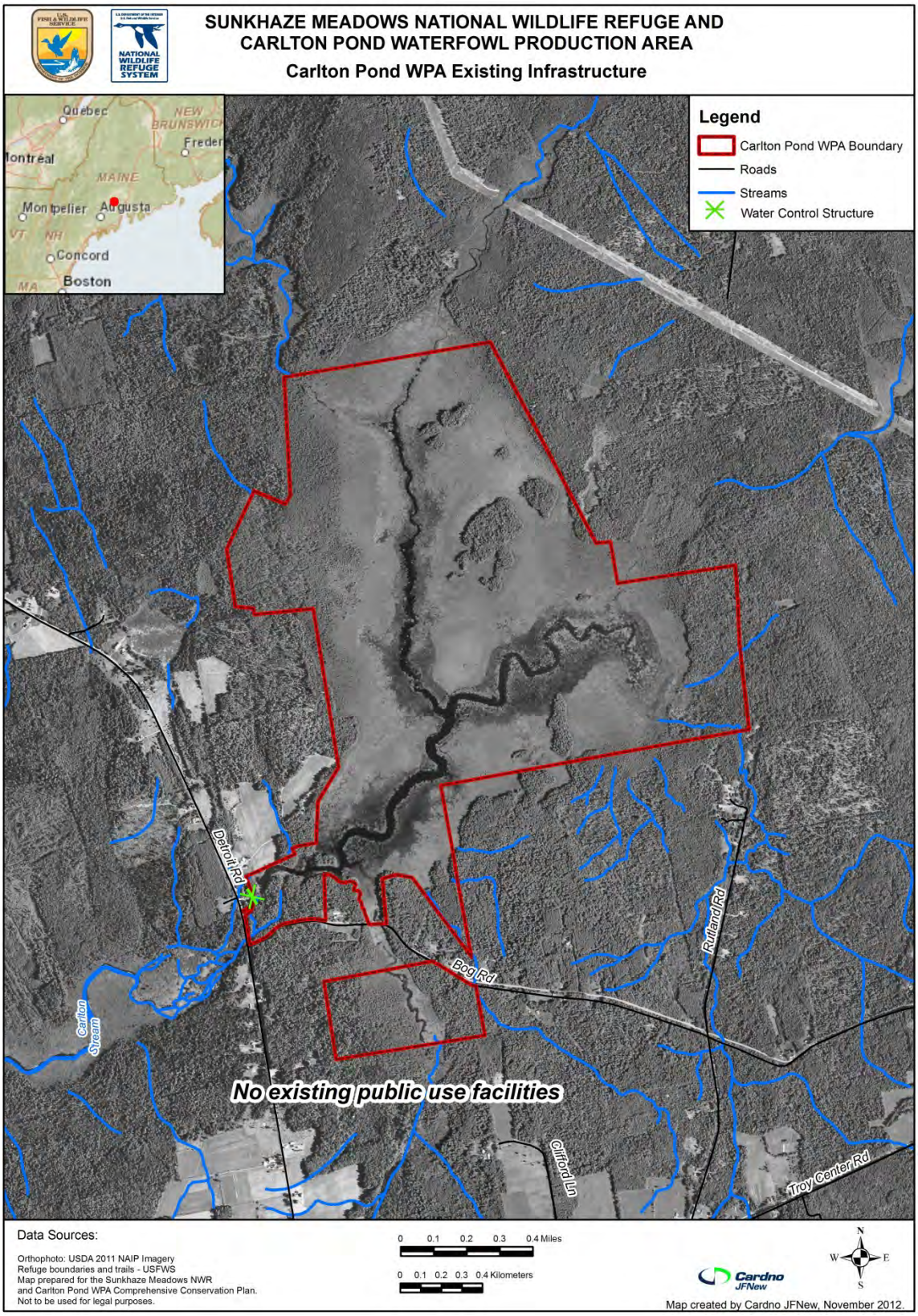
MISSION OF THE NATIONAL WILDLIFE REFUGE SYSTEM:
"To administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans." (16 U.S.C. 668dd-668ee) (National Wildlife Refuge System Administration Act of 1966)

DESCRIPTION OF USE:
(a) What is the use? Is it a priority public use?
The use is furbearer management. We consider furbearer management to be a Service management economic activity. It is not a priority public use of the National Wildlife Refuge System under the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd-668ee), as amended by the National Wildlife Refuge System Improvement Act of 1997.

(b) Where will the use be conducted?
Furbearer management through trapping is an allowable practice in Maine. Currently, there are no restricted locations within the Carlton Pond WPA. Zones have not been established nor limits set. However, if necessary, such controls could be implemented to meet our goals for protecting WPA resources.

Service law enforcement will ensure that trappers on the WPA comply with State regulations.

Map B.29. Service lands and waters open to furbearer management within Carlton Pond WPA (see text for details).



(c) When will the use be conducted?
Furbearer management will be conducted in accordance with the State of Maine seasons. Maine furbearer management seasons usually run from mid-October to the end of December, with beaver trapping in Wildlife Management District 23, where the Carlton Pond WPA is located, allowed until the end of March.

(d) How will the use be conducted?
The WPA will be open to furbearer management for the following species: beaver, bobcat, mink, fisher, marten, coyote, fox, muskrat, opossum, otter, raccoon, red squirrel, skunk, and weasel. Although bear trapping is allowed in Maine, bears are not considered a furbearer. Bear trapping is not allowed.

We will continue to allow furbearer management following Maine State regulations during State seasons and under State limits for the targeted species. Visitors participating in approved public uses are allowed off-trail; however, off-trail use is limited to pedestrian access only (i.e., walking and snowshoeing). To facilitate checking traps and retrieval of game, trappers will be allowed to use snowshoes.

Special use permits will not be required per 50 CFR 31.16, "Land acquired as 'waterfowl production areas' shall be open to public trapping without a Federal permit provided that…all or part of individual areas may be temporarily suspended by posting upon occasions of unusual or critical conditions affecting land, water, vegetation, or wildlife populations."

To gather information about trapping effort and furbearer populations, we will encourage persons who inquire about trapping at Carlton Pond WPA to communicate with us at the end of the season to let us know how much time they spent and what they caught.

(e) Why is this use being proposed?
As discussed above, per 50 CFR 31.16, "Land acquired as 'waterfowl production areas' shall be open to public trapping…." Because trapping is considered an economic use, per Federal law (see 16 U.S.C. 715s) and Service regulations (50 CFR 29.1), we may only allow economic uses of a refuge or WPA natural resource where the use contributes to achieving refuge or WPA purposes or the Refuge System mission. We will conduct furbearer management: (1) as a tool to manage habitat and maintain the predator-to-prey balance, (2) as a mechanism to collect survey and monitoring information that otherwise will be expensive and difficult to obtain using Service resources, and (3) as a way to collect initial data that may lead to research on furbearer (and other wildlife) occurrence, activity, movement, population status, and ecology. By maintaining a trained, experienced group of trappers, the Service can use their skills and local knowledge to perform or assist in valuable management or research functions. Trappers could potentially provide assistance with the implementation of structured management objectives, such as the alleviation or reduction of wildlife damage conflicts, negative interactions among species, and habitat modifications. Trappers on the WPA typically have a stake in proper habitat and wildlife conservation and protection of the ecological integrity of the refuge so they can continue trapping. Accordingly, they are valuable assets for the refuge manager in providing onsite reports concerning the fundamental status of habitat, wildlife, and WPA conditions.

AVAILABILITY OF RESOURCES:
The financial resources necessary to provide and administer this use at its current level are now available, and we expect them to be available in the future. A Service law enforcement officer, in coordination with other law enforcement agencies, will check trappers and ensure compliance with State regulations.

A breakdown of the projected annual cost of the trapping programs is shown below:

Law Enforcement:	$800

ANTICIPATED IMPACTS OF THE USE:
The impacts of furbearer management on the purposes of the WPA and mission of the Refuge System can be either direct or indirect, and may have negative, neutral, or positive impacts on WPA resources.

Direct effects include the removal of individuals of both target (i.e. furbearer) and non-target species. Indirect impacts include reduced production among migratory birds resulting from disturbance during the pair bonding/nesting season, increased recruitment of birds as a result of removing predators of birds or their nests, or habitat change as a consequence of the removal of species that alter habitats (e.g., beavers or muskrats).

Impacts to Furbearers:
The impacts of the furbearer management program obviously include those on the furbearer populations themselves. Trapping harvests and removes individuals of the species, yet State natural resources agencies indicate that, with exceptions, furbearer populations are stable or increasing. The anticipated direct impacts of trapping on wildife will be a temporary reduction of furbearer populations in those areas where surplus furbearers exist. The removal of excess furbearers from those areas will maintain furbearer populations at levels compatible with the habitat and with WPA objectives, minimize furbearer damage to facilities and wildlife habitat, minimize competition with or interaction among wildlife populations and species that conflict with WPA objectives, and minimize threats of disease to wildlife and humans.

Furbearer species have the potential to significantly alter WPA habitats without regulated trapping. Furbearing species must be managed at levels consistent with WPA habitat, wildlife, and public use objectives. Regulated trapping is the most desirable and effective method to accomplish an acceptable balance (Payne 1980, Jensen et al. 1999). Hunting alone is relatively ineffective in managing aquatic and many terrestrial furbearer species due to their secretive habits; trapping is the single-most viable management alternative (Payne 1980). Unchecked furbearer populations can exhibit marked fluctuations in numbers often with severe consequences for habitat, wildlife, and humans. By way of illustration, in the absence of regulated trapping, the beaver population in Massachusetts increased from 24,000 in 1996 to more than 52,000 in 1999 (S. Langlois, Furbearer Project Leader, Massachusetts Division of Fisheries and Wildlife, personal communication).

A national program operated under the guidance of the Fur Resources Technical committee of the International Association of Fish and Wildlife Agencies (IAFWA 1998) systematically

improves the welfare of animals in trapping through trap testing and the development of "Best Management Practices (BMPs) for Trapping Furbearers in the United States." The WPA will cooperate with and contribute to the development and implementation of those BMPs by practicing an integrated, comprehensive approach to furbearer management, wherever and whenever possible.

Impacts to Other Wildlife:
Non-target species could be taken incidentally through this trapping program. Traps will be set specifically around areas of targeted species activity to reduce the risk of taking species other than targeted species. The experience of the trappers and the selection of the appropriate trap size will reduce non-target captures (Northeast Furbearer Resources Technical Committee 1996, Boggess et al. 1990). State regulations require that bait be covered, so birds of prey are not able to see the bait from above. Lynx (federally listed as endangered) have not been documented on the WPA. Therefore, potential impacts to lynx are negligible or nonexistent. If lynx are someday identified on the WPA, the refuge manager will work with the State of Maine to implement measures to prevent accidental take of lynx. The refuge manager will ensure that measures are utilized to avoid take of waterfowl and endangered species.

Trappers may temporarily disturb wildlife while walking or snowshoeing around the WPA. Disturbances vary by wildlife species involved and the type, level, frequency, duration, and the time of year activities occur. Disturbance can cause shifts in habitat use, abandonment of habitat, and increased energy demands on affected wildlife (Knight and Cole 1991). Miller et al. (1998) found bird abundance and nesting activities (including nest success) increased as distance from a recreational trail increased in both grassland and forested habitats. In this study, common species (e.g., American robins) were found near trails and rare species (e.g., Blackburnian warblers) were found farther from trails. In some cases there is a clear link between the extent of disturbance and either the survival or reproductive success of individuals (e.g., Schulz and Stock 1993), but in many cases disturbance acts in a more subtle way, by reducing access to resources such as food supplies or nesting sites (Gill et al. 1996). Bird flight in response to disturbance can lower reproductive success by exposing individuals and nests to predators. For recreation activities that occur simultaneously (e.g., hiking, biking) there will likely be compounding negative impacts to wildlife (Knight and Cole 1991). However, because of the temporal separation of trapping activities and breeding wildlife using the WPA, disturbance of migratory birds by trappers will be negligible, and can be further reduced by regulating trapping activity in certain areas at times when such birds are likely to be present.

Conflicts with Other Public Uses:
A program of regulated furbearer management on the WPA as described under this compatibility determination is not expected to conflict with other public uses. With respect to possible negative reaction to trapping on the WPA by some members of the visiting public, conflicts are not expected because trapping is generally an inconspicuous activity, traps are usually hidden from view, typically are not set near roads, and are checked in the early morning. These characteristics serve to limit the potential for encounters between traps or captured animals and those engaged in other public use activities.

Other Beneficial Impacts:
Regulated trapping has been documented to provide a variety of ecological benefits including prevention and alleviation of habitat degradation, facilitation of habitat and wildlife restoration, reduction of predation on key species of management concern, protection of rare and endangered species, dampening of disease transmission and severity of disease outbreaks among wildlife and between wildlife and humans, and the conservation and enhancement of biological and genetic diversity (Boggess et al. 1990, Organ et al. 1996).

Implementation of a regulated trapping program on the WPA provides a potential mechanism to collect survey and monitoring information, or contribute to research on furbearer (and other wildlife) occurrence, activity, movement, population status, and ecology. The ecological and monitoring benefits are management services that will be accomplished through minimal or even no cost to the government, compared to costs associated with using salaried staff or contractual arrangements with private individuals or organizations, other agencies, or refuge staff. By maintaining a trained and experienced cadre of trappers, the Service can utilize their skills and local knowledge to perform or assist with valuable management or research functions (Mason 1990). Trappers who participate in the WPA program will provide assistance with the implementation of structured management objectives, such as the alleviation or reduction of wildlife damage conflicts, negative interactions among species, and habitat modifications. Trappers typically have a stake in proper habitat and wildlife conservation and protection of the ecological integrity of the WPA so they can continue trapping. Accordingly, they are valuable assets for the refuge manager in providing on-site reports concerning the fundamental status of habitat, wildlife, and WPA conditions.

Furbearers are considered a renewable natural resource with cultural and economic values (Andelt et al. 1999, Boggess et al. 1990, Northeast Furbearer Resources Technical Committee 1996, Payne 1980). Several human dimensions studies have documented trapper profiles, cultural aspects of trapping, and the socioeconomic role of trapping in the United States (Andelt et al. 1999, Boggess et al. 1990, Daigle et al. 1998, Gentile 1987). A regulated trapping program on the WPA also fosters the appreciation of wildlife and nature, wildlife observation, environmental education, a greater understanding of ecological relationships, stewardship of natural resources, and inter-generational passage of the methodologies of renewable resource use. Trapping is an activity in which family members and friends often participate together and share joint experiences that broaden the sense of appreciation for natural resources and ecological awareness, and indeed even a sense of community (Glass et al. 1991, Daigle et al. 1998).

PUBLIC REVIEW AND COMMENT:
As part of the comprehensive conservation plan (CCP) process for Sunkhaze Meadows National Wildlife Refuge and Carlton Pond WPA, this compatibility determination was available for public review and comment for 39 days concurrent with the release of our draft CCP and environmental assessment.

DETERMINATION (check one below):
This use is compatible __X__

This use is not compatible _____

STIPULATIONS NECESSARY TO ENSURE COMPATIBILITY:

- Trappers must have a State license and comply with all State regulations relating to trapping.

- Trappers, when requested by refuge staff or Federal or State enforcement officers, must display for inspection their State trapping license, trapping equipment, and all animals in their possession.

- Traps shall be set only where traps or trapped furbearers are not readily visible from public highways, overlooks, or other visitor facilities (if established). No land sets may be set within 100 feet of any road or trail (if established) open to the public.

- Use of all-terrain vehicles is prohibited anywhere on the WPA. Trappers must not interfere with or cause hazards to vehicular travel, or the activities of other WPA visitors.

- The use of exposed bait and setting traps adjacent to naturally occuring carcasses are prohibited.

- Non-target animals that are uninjured should be released immediately. Injured or killed animals must be reported as specified by the Maine Department of Inland Fisheries and Wildlife trapping regulations.

- Trappers are encouraged to communicate with us at the end of the season to let us know how much time they spent and what they caught

JUSTIFICATION:
We have determined that allowing trapping on the WPA will not materially interfere with or detract from the mission of the National Wildlife Refuge System or the purposes for which the WPA was established for the following reasons. First, furbearer populations, with local exceptions, are stable or increasing in Maine and the furbearer management program on the WPA does not have any known negative impacts on furbearer populations. Second, at current and projected levels of use, adverse impacts to wildlife and habitat are expected to be minimal because of the temporal separation of trapping activities (usually fall and winter) and breeding wildlife (usually in spring) using the WPA.

In fact, based on the analysis presented above, we have determined that it will contribute to the mission of the National Wildlife Refuge System and the purposes for which the WPA was established. Furbearer management through trapping on the WPA is a useful tool in maintaining balance between furbearers and habitat. High populations of predators can decrease the survival and nesting success of migratory birds, thus compromising the central purpose of the WPA. Trapping may provide survey and monitoring information that otherwise will be expensive and

difficult to obtain using Service resources; and potentially may contribute to research on furbearer (and other wildlife) occurrence, activity, movement, population status, and ecology. By maintaining a trained, experienced group of trappers, the Service can use their skills and local knowledge to perform or assist in valuable management or research functions. Trappers who participate could provide assistance with the implementation of structured management objectives, such as the alleviation or reduction of wildlife damage conflicts, negative interactions among species, and habitat modifications; maintenance of the vigor and health of furbearer populations; and safeguarding the WPA infrastructure critical to habitat management for focal fish and wildlife species. Trapping also helps build appreciation for natural resources, ecological awareness, and support for the Refuge System.

SIGNATURE:

Refuge Manager: Beth Goettel (Signature) 8/19/2013 (Date)

CONCURRENCE:

Regional Chief: (Signature) 9/17/2013 (Date)

MANDATORY 10 YEAR RE-EVALUATION DATE: 9/17/2023

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FWS Form 3-2319
02/06

Finding of Appropriateness of a Refuge Use

Refuge Name: Carlton Pond Waterfowl Production Area

Use: Retriever hunt test and field trial

This exhibit is not required for wildlife-dependent recreational uses, forms of take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision criteria:	YES	NO
(a) Do we have jurisdiction over the use?	X	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	X	
(c) Is the use consistent with applicable Executive orders and Department and Service policies?	X	
(d) Is the use consistent with public safety?	X	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?	X	
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	X	
(g) Is the use manageable within available budget and staff?	X	
(h) Will this be manageable in the future within existing resources?	X	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	X	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D. for description), compatible, wildlife-dependent recreation into the future?	X	

Where we do not have jurisdiction over the use ("no" to (a)), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to (b), (c), or (d)) may not be found appropriate. If the answer is "no" to any of the other questions above, we will **generally** not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes X No ___

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate: ____ **Appropriate:** X

Refuge Manager: Beth Goettel Date: 8/19/2013

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use.

If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence.

If found to be **Appropriate**, the refuge supervisor must sign concurrence:

Refuge Supervisor: [illegible] Date: 9/11/13

A compatibility determination is required before the use may be allowed.

Justification for a Finding of Appropriateness of a Refuge Use

Refuge Name: Carlton Pond Waterfowl Production Area

Use: Retriever hunt test and field trial

Narrative:
Members of the Maine Retriever Club occasionally request to use Carlton Pond Waterfowl Production Area (WPA) briefly as one of the water trial sites in their annual retriever hunt test and an annual field trial. The events consist of dogs competing in a series of tests to assess their ability to retrieve downed game. The events adhere to standards as set by the American Kennel Club. This is not a priority public use; however, the use of dogs to retrieve downed game is related to the priority public use of hunting. The objective of permitting these hunt tests and field trials on Service lands is to encourage practices and techniques that enhance the tradition and quality of the hunting experience and reduce the incidence of downed but unretrieved game. We also believe allowing this use will facilitate observation, and appreciation by participants and observers of the event, of the WPA's wildlife, habitats, and conservation programs.

This use is conducted where a finger of Carlton Pond crosses Bog Road; it is estimated that activities will involve less than 10 percent of the water area and less than 7 acres of WPA lands. Previous requests for the retriever hunt test have been for late August, not before August 14 and not after August 31; the field trial has been scheduled during the third weekend in September, so waterfowl breeding is over and the hunting season has generally not begun. A special use permit (SUP) is issued annually, requiring compliance with the specific requirements outlined in Service Manual Chapter 631 FW 5, Field Trials. Because we require organizers of these events to obtain a SUP prior to holding the events, this use is also consistent with 50 CFR 27.91 which prohibits field trials for dogs on national wildlife refuge except where authorized by a SUP.

COMPATIBILITY DETERMINATION

USE: Retriever Hunt Test and Field Trial

REFUGE NAME: Carlton Pond Waterfowl Production Area

DATE ESTABLISHED: November 24, 1965

ESTABLISHING AUTHORITIES:
Carlton Pond Waterfowl Production Area (WPA) was authorized by administrative action on July 15, 1964. The WPA was officially established when the first parcel was acquired on November 24, 1965. It was established under the following legislative authorities:

1. Migratory Bird Hunting and Conservation Stamp Act of 1934 (16 U.S.C. 718c)

2. Migratory Bird Conservation Act of 1929 (16 U.S.C. 715d)

PURPOSE(S) FOR WHICH ESTABLISHED:

1. "…as Waterfowl Production Areas" subject to "…all the provisions of such Act [Migratory Bird Conservation Act] …except the inviolate sanctuary provisions…" ((16 U.S.C. 718c) (Migratory Bird Hunting and Conservation Stamp Act)).

2. "…for any other management purpose, for migratory birds." ((16 U.S.C. 715d) (Migratory Bird Conservation Act)).

MISSION OF THE NATIONAL WILDLIFE REFUGE SYSTEM:

"To administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife and plant resource and their habitats within the United States for the benefit of present and future generations of Americans." (16 U.S.C. 668dd-668ee) (National Wildlife Refuge System Administration Act of 1966)

DESCRIPTION OF USE:
(a) What is the use? Is the use a priority use?
The use is an annual retriever hunt test and an annual field trial. The events consist of dogs competing in a series of tests against other dogs to test their ability to retrieve downed game. The events adhere to standards as set by the American Kennel Club and are coordinated by a local group, the Maine Retriever Trial Club, Inc. This is not a priority public use, however, the use of dogs to retrieve downed game is related to the priority public use of hunting.

(b) Where will the use be conducted?
During the hunt test and the field trial, many sites in the area are used to accommodate all the different tests or age classes of dogs. The use of Carleton Pond has been requested because several water bodies in the area are required, and the availability of Carlton Pond is very helpful in making these events logistically possible. When the club uses Carlton Pond, they will access

the pond where a finger of it crosses Bog Road (see map); it is estimated that activities will involve less than 10 percent of the water area.

Parking and placement of the portable toilet is in a lot on private land nearby and additional parking is available off WPA lands, along Bog Road.

(c) When will the use be conducted?
The hunt test is scheduled in late August, not before August 14 and not after August 31, and the field trial is held the third weekend in September each year. Hunt tests and field trials held by the club earlier in the season will not be allowed to use Carlton Pond due to the conflict with the waterfowl breeding season. Dog training is not allowed at Carlton Pond at any time.

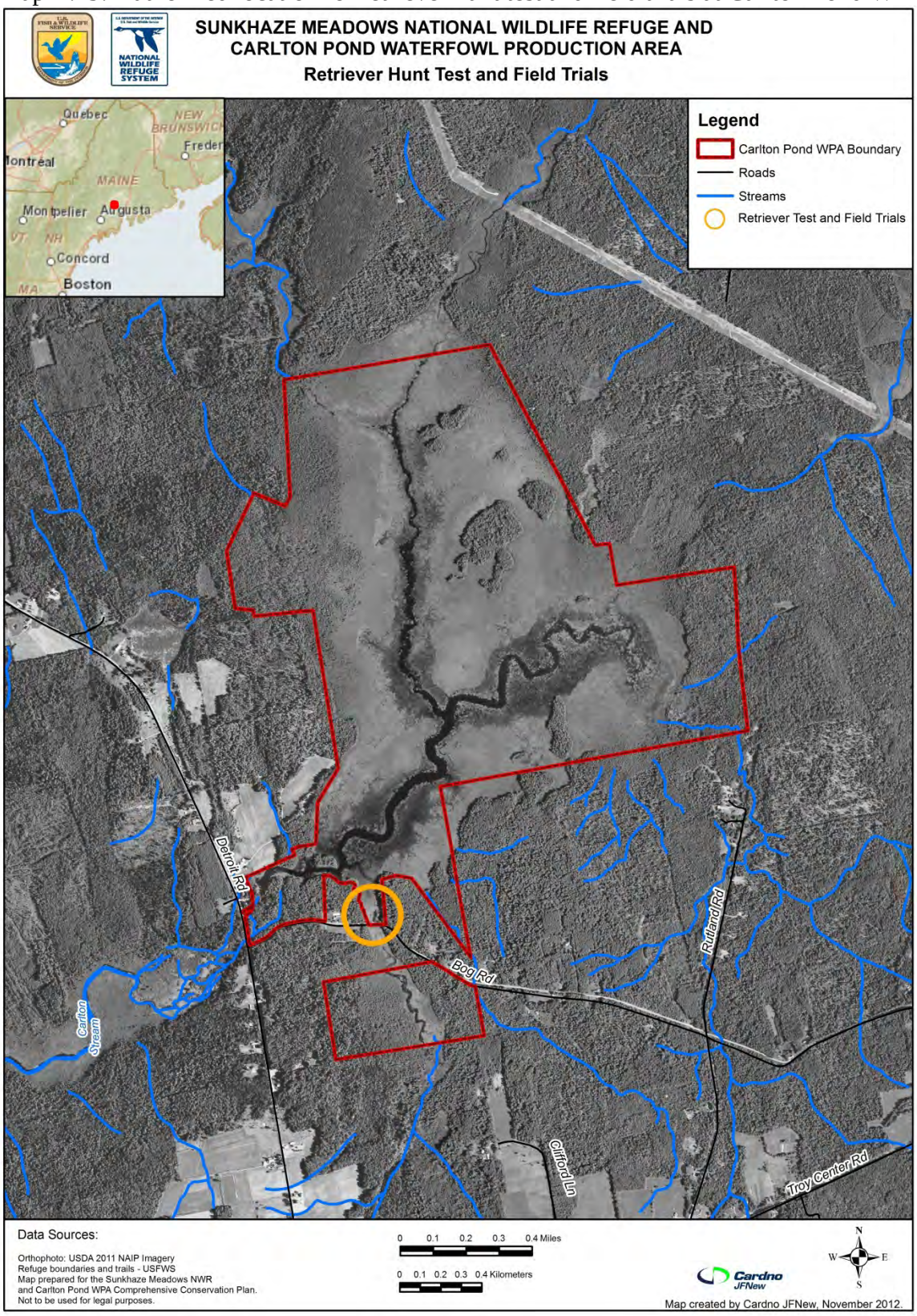
(d) How will the use be conducted?
Typically, field trials have four levels in which dogs can compete, with between 10 to 60 dogs in a given level. Each level requires that dogs are tested in both land and water.

The trials are set up to progressively eliminate dogs that fail to meet the standards of each series of the tests. Land tests are almost always run first, which usually eliminates over half of the dogs running in a given level. The water series usually starts the second day of the competition and begins with what are called blind retrieves. The blind retrieves require a handler to get the dog to a point between 100 and 400 yards away using whistles and hand signals, simulating picking up a downed bird that the dog did not see shot or fall. The final series of the competition at each level tests the ability of the dogs to retrieve ducks that are simulated to have been shot and fallen in or around the water. The simulation usually involves a series of two to four fired shots with a duck thrown to a specific location for each shot. Sometimes, one of those shots within the series includes shooting a live farm-raised duck. Except for the live duck being shot, each of the other retrieves are required to occur in the same location, making it more fair to judge the quality of the retrieve. The water series usually occurs on the last day of the competition and tests only the dogs which have not been eliminated in the first three series.

In their entirety, tests and field trial to be held in this area will serve an estimated 150 to 225 dogs and 20 to 60 handlers per event. The land tests will be run on Saturday at other locations and the any water tests using Carlton Pond will begin either very late Saturday afternoon, or more likely on Sunday. There will be an estimated 70 dogs involved in the water trials at Carlton Pond and an estimated 210 to 280 shotgun rounds fired. Non-toxic shot will be used. Birds must be certified disease free. Like other visitors, dog handlers participating in approved public uses are allowed off-trail; however, off-trail use is limited to pedestrian access only (e.g., walking, snowshoeing, skiing).

(e) Why is the use being proposed?
This is an historic use of the refuge and the Maine Retriever Trial Club was not aware of the need to apply for a special use permit (SUP). Refuge staff were not aware that this activity was ongoing until the fall of 2008; no complaints have ever been received. Upon finding out about the requirement to obtain a permit, the club officers promptly applied for one. An interim compatibility determination was issued, with the intent of re-examining the use during the Sunkhaze Meadows National Wildlife Refuge Comprehensive Conservation Plan.

Map B.29. Authorized location for retriever hunt test and field trials at Carlton Pond WPA.



The activity is wildlife oriented, facilitates a priority public use (hunting) by improving the retrieval of downed waterfowl through the use of well trained dogs, minimizing crippling losses and facilitates observation, and appreciation by participants and observers of the event of the WPA's wildlife, habitats, and conservation programs.

AVAILABILITY OF RESOURCES:
This event does not require any special permanent facilities. The retriever club arranges for the delivery and removal of temporary portable toilets on adjacent private land, and directs and controls parking along one side of Bog Road. The refuge staff issues the SUP and monitors the activity to insure compliance with the requirements of the SUP. This activity is within the budget and staffing capabilities of the refuge to manage.

The following is the list of the approximate costs to the refuge required to administer and monitor the SUP including coordinating with the permittee:

Administrative time:	$ 30
Monitoring: (12 hours of Law Enforcement Officer and/or biologist)	$ 504
Total Cost:	**$ 534**

ANTICIPATED IMPACTS OF THE USE:
Direct Impacts:
Field trials have the potential to adversely impact wildlife resources through direct disturbance. The presence of dogs may displace foraging birds (Lafferty 2001), disrupt their nesting behavior (Langston et al. 2007, Lord et al. 2001, Taylor et al. 2007), or destroy nests (Nol and Brooks 1982). These effects appear to be most pronounced for species that nest or feed on the ground. The presence of dogs may also reduce both bird diversity and abundance (Banks and Bryant 2007). The visual presence of dogs may alter the physiology and behavior of mammals (Miller et al. 2001) and their persistent scent may displace mammalian predators (George and Crooks 2006, Lenth et al. 2008, Reed and Merenlender 2008).

Miller et al. (2001) showed that the presence of a pedestrian is the additive factor in disturbing wildlife when comparing wildlife response to dog-alone, pedestrian-alone, and dog-on-leash treatments. Flush distance and distance moved were almost always greater when activities occurred off-trail versus when the same activities occurred on-trail, suggesting that where recreational activities occurring on-trail are frequent and spatially predictable, animals will likely habituate to activity in these locations.

The role of dogs in wildlife diseases is poorly understood. However, dogs host endo- and ecto-parasites, and can contract diseases from or transmit diseases to wild animals. In addition, dog waste is known to transmit diseases that may threaten the health of some wildlife and other domesticated animals. Domestic dogs potentially can introduce various diseases and transport parasites into wildlife habitats (Sime 1999). To minimize this risk, it will be required that handlers collect and properly dispose of any dog feces deposited during the events.

To minimize disturbance to wildlife, the trials will not be held during the waterfowl breeding season. The period of time during which these events are allowed to use Carlton Pond are after the waterfowl breeding season and before the regular waterfowl hunting season begins. Since only a small portion of the water area is being used, any waterfowl that may be using the pond can move to other areas for the small number of days involved. No wild animals will be killed as part of this event, and only non-toxic shot will be allowed to be used on the captive-bred ducks. Captive-reared ducks must be of indigenous species or established exotic species only and must be certified disease-free.

Direct impacts associated with this use also include vegetation disturbance. The access area has a large stand of wild rice. Although the intent is to use the open water areas, at times dogs will be running through emergent vegetation to get to the water or swimming through vegetation to reach a dummy or duck.

Because the activity takes place in August and September, the wild rice growing in the area is already mature. If plants are bent over or broken off at this point, rice kernels will be dislodged, but the plant itself will not be killed. Rice kernels knocked into the water will either be eaten by waterfowl or sink to the bottom to overwinter in the mud and serve as a seed source for spring germination. No long-term impacts to vegetation are anticipated.

The activity may create a conflict with other potential visitors to the WPA. The September weekend date occasionally overlaps with the state's Youth Waterfowl Hunt day on Saturday of that weekend. The club cannot reschedule the event, as dates are assigned by the American Kennel Club to be part of a traveling circuit, so the change to another date will conflict with another event elsewhere. Since the water trials, the only portion that may occur at the pond, begin late on Saturday and more likely only on Sunday, few youth hunters should be inconvenienced. Even if they plan to hunt late on Saturday and arrive to find the field trial ongoing, they could still access the other parts of the pond or hunt in other nearby wetlands. In the 4 years that the use has been allowed by SUP, it only occurred on the same weekend as the Youth Waterfowl Hunt once.

We currently have no data on the number of youth hunters that may use Carlton Pond. In the 4 years of interim compatibility, refuge staff have never actually observed the event. This will be corrected during the coming 5 year compatibility period, as mandatory prior notification and staff attendance will be required. The refuge personnel who will monitor the event will count the number of youth hunters they finds using the pond on this day as well as the number of dogs and handlers, and will document any user conflicts or other impacts observed.

Indirect Impacts:
Indirect impacts will include effects from pollution, litter, introduction of lead shot or non-indigenous birds, or diseased birds, or erosion caused by the activity. The stipulations of the SUP make these impacts unlikely to occur.

Cumulative Impacts:
Since this activity occurs but twice a year, in a relatively small area and the direct impacts to vegetation and wildlife are not large, we do not anticipate any significant cumulative impacts.

PUBLIC REVIEW AND COMMENT:
As part of the comprehensive conservation plan (CCP) process for Sunkhaze Meadows National Wildlife Refuge and Carlton Pond WPA, this compatibility determination was available for public review and comment for 39 days concurrent with the release of our draft CCP and environmental assessment.

DETERMINATION (check one below):
This use is compatible __X__

This use is not compatible _____

STIPULATIONS NECESSARY TO ENSURE COMPATIBILITY:

- The group sponsoring a field trial is required to obtain a SUP from the refuge (per 50 CFR 27.91) which must be re-issued annually. There will be a nominal fee to cover the cost of processing the SUP, currently around $50.00

- Notification of the date and time Carlton Pond will be used as part of a test or trial is required to be given to the refuge staff one week prior to the use and a staff member of the refuge is required to be present to enforce the stipulations of the permit and evaluate the impacts of the activity each time Carlton Pond WPA is used.

- All birds utilized in the trial must be pen-reared game farm stock.

- Only indigenous species or established exotic species of birds may be used as target animals for the field trials.

- Target animals used must have a health certificate, issued by a veterinarian, that provides reasonable assurance of the absence of Type C botulism, avian cholera, duck plague (duck viral enteritis), and aspergillosis.

- A written certification from the game farm operator that he has not had any disease diagnosed or any undiagnosed die-off occurring on his premises within the previous 6-month period must be provided to the refuge manager prior to the trial.

- Target animals should be brought to the site in disposable crates (e.g. cardboard boxes) that have not been used before. Such crates must be properly disposed of after use.

- Only federally approved non-toxic shot may be used in taking the birds.

- Dog feces deposited during the event must be immediately picked up and properly disposed of.

- The trial must be conducted in an orderly manner.
- No alcoholic beverages are allowed at the event.
- The permittee is responsible for collecting and clearing debris and litter during and following the trial.
- Necessary State permits must be obtained prior to the start of the trial.
- An adequate number of portable toilets must be placed nearby and promptly removed after the event.
- Parking must be managed so as not to impede access by emergency vehicles and normal traffic on the road, and so as not to annoy neighbors or impede access to their driveways.
- The number of dogs involved in activities at Carlton Pond WPA must not exceed 70 and the number of handlers must not exceed 50.
- There is no room for concessions at this site; therefore, no concessions will be allowed.

At the refuge manager's discretion, applicants that receive a SUP for this use that fail to comply with one or more of these stipulations may not receive a permit in future years.

JUSTIFICATION:
The objective of permitting these hunt tests and field trials on Service lands is to encourage practices and techniques that enhance the tradition and quality of the hunting experience and reduce the incidence of downed but unretrieved game. These particular retriever tests and field trials, due to their seasonal timing and limited duration, can be managed within existing refuge resources. The refuge SUP conditions limit the scope of the field trial activities to specific dates and areas and assure that the activity is carried out in a manner that minimizes impacts on wildlife and habitat.

At this time, we believe that the retriever hunt tests and retriever trials as proposed do not materially interfere with or detract from purposes for which the WPA was established or the mission of the National Wildlife Refuge System. We will carefully monitor potential impacts to refuge resources and potential conflicts with other visitors over the next 5 years. We will reevaluate this activity in 5 years, or sooner if deemed necessary. Should conflicts or impacts be observed, stipulations in the SUP may be modified or added to minimize these conflicts, or the activity may be terminated.

SIGNATURE:

Refuge Manager: Beth Goettel (Signature) 8/30/2013 (Date)

CONCURRENCE:

Regional Chief: Scott B. Kahn (Signature) 9/17/2013 (Date)

SERVICE REQUESTED 5 YEAR RE-EVALUATION DATE: 9/17/2018

BIBLIOGRAPHY:

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Reed, S.E., and A.M. Merenlender. 2008. Quiet nonconsumptive recreation reduces protected area effectiveness. Conservation Letters 1(3):146-154.

Sime, C.A. 1999. Domestic Dogs in Wildlife Habitats. Pp. 8.1-8.17 in G. Joslin and H. Youmans, coordinators. Effects of recreation on Rocky Mountain wildlife: A Review for Montana. Committee on Effects of Recreation on Wildlife, Montana Chapter of The Wildlife Society.

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U.S. Fish and Wildlife Service (USFWS). Service Manual Chapter 631 FW 5, Field Trials.

FWS Form 3-2319
02/06

Finding of Appropriateness of a Refuge Use

Refuge Name: Carlton Pond Waterfowl Production Area

Use: Boating

This exhibit is not required for wildlife-dependent recreational uses, forms of take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision criteria:	YES	NO
(a) Do we have jurisdiction over the use?	X	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	X	
(c) Is the use consistent with applicable Executive orders and Department and Service policies?	X	
(d) Is the use consistent with public safety?	X	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?	X	
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	X	
(g) Is the use manageable within available budget and staff?	X	
(h) Will this be manageable in the future within existing resources?	X	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	X	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D. for description), compatible, wildlife-dependent recreation into the future?	X	

Where we do not have jurisdiction over the use ("no" to (a)), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to (b), (c), or (d)) may not be found appropriate. If the answer is "no" to any of the other questions above, we will **generally** not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes X No ___

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate: ____ **Appropriate:** X

Refuge Manager: Beth Goettel Date: 8/30/2013

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use.

If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence.

If found to be **Appropriate**, the refuge supervisor must sign concurrence:

Refuge Supervisor: [illegible] Date: 9/11/13

A compatibility determination is required before the use may be allowed.

Justification for a Finding of Appropriateness of a Refuge Use

Refuge Name: Carlton Pond Waterfowl Production Area

Use: Boating

Narrative:
Boating is an historic use of Carlton Pond Waterfowl Production Area (WPA) that occurred before the WPA was created. Hunting, fishing, wildlife observation and photography, and environmental education and interpretation are the six priority public uses of the National Wildlife Refuge System (Refuge System). The Refuge System Improvement Act of 1997 instructs refuge managers to seek ways to accommodate those six uses. Motorized and non-motorized boating is an appropriate means of facilitating these priority public uses on the WPA since much of the WPA is only accessible by water. Jet skis will not be permitted on WPA waters due to their environmental impact, noise, speed, and excessive wildlife disturbance. There are currently no motor or speed limitations since boats access is limited to hand-carry sites. The use has been allowed on the WPA since it was established with no significant adverse effects observed. U.S. Fish and Wildlife Service staff will continue to monitor the use and could implement both motor and speed limitations if wake or speeds become harmful to wildlife or habitat, or in the interest of public safety.

By allowing this use, we are providing opportunities and facilitating WPA programs in a manner and location that offer wildlife-dependent recreation and maintains the level of current fish and wildlife values. For these reasons, we have determined that allowing this use is consistent with the U.S. Fish and Wildlife Service policy on the appropriateness of refuge uses.

COMPATIBILITY DETERMINATION

USE: Boating

REFUGE NAME: Carlton Pond Waterfowl Production Area

DATE ESTABLISHED: November 24, 1965

ESTABLISHING AUTHORITIES:
Carlton Pond Waterfowl Production Area (WPA) was authorized by administrative action on July 15, 1964. The WPA was officially established when the first parcel was acquired on November 24, 1965. It was established under the following legislative authorities:

1. Migratory Bird Hunting and Conservation Stamp Act of 1934 (16 U.S.C. 718c)

2. Migratory Bird Conservation Act of 1929 (16 U.S.C. 715d)

PURPOSE(S) FOR WHICH ESTABLISHED:

1. "…as Waterfowl Production Areas" subject to "…all the provisions of such Act [Migratory Bird Conservation Act] …except the inviolate sanctuary provisions…" ((16 U.S.C. 718c) (Migratory Bird Hunting and Conservation Stamp Act)).

2. "…for any other management purpose, for migratory birds." ((16 U.S.C. 715d) (Migratory Bird Conservation Act)).

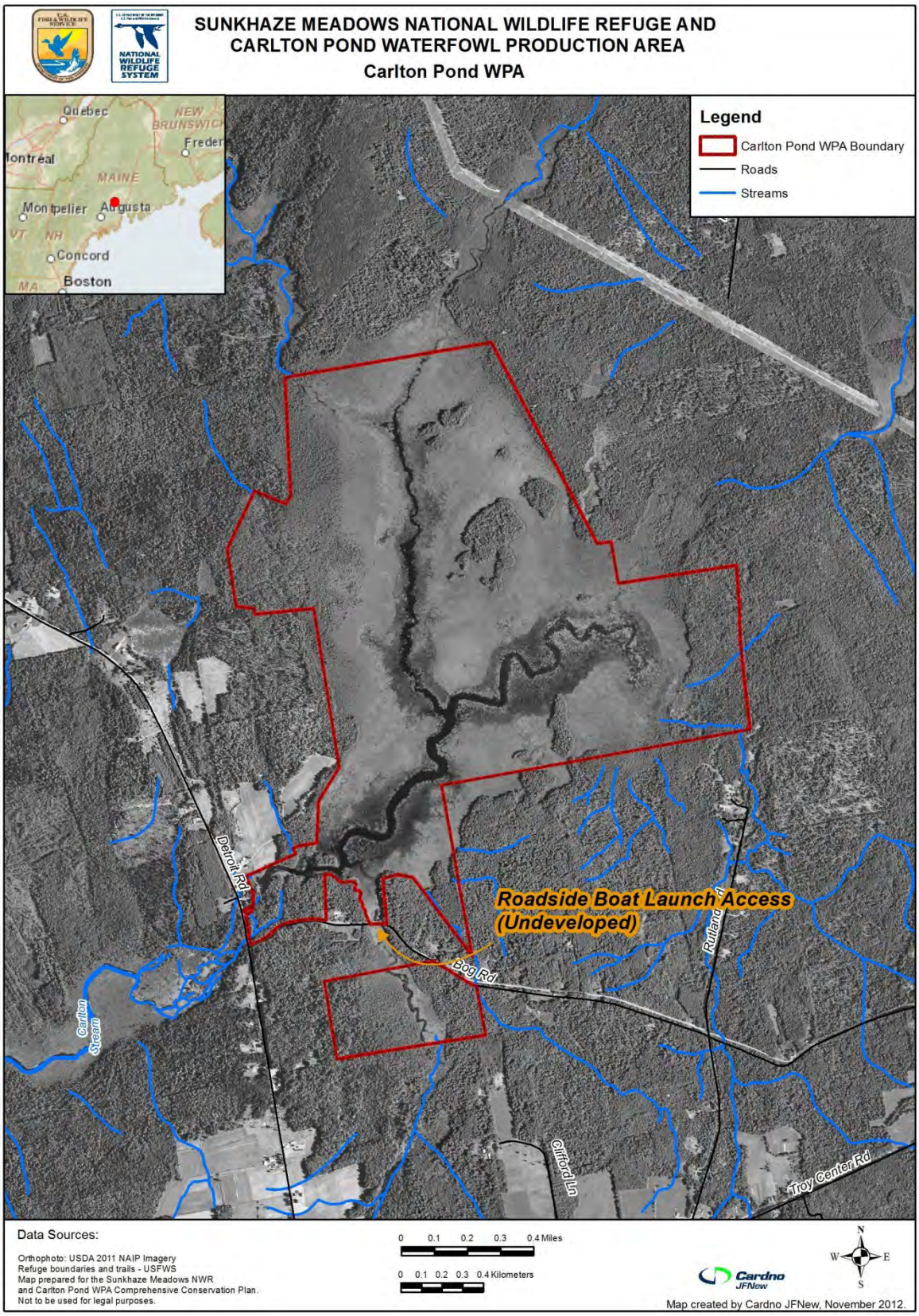
MISSION OF THE NATIONAL WILDLIFE REFUGE SYSTEM:
"To administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans." (16 U.S.C. 668(dd) and (ee)) (National Wildlife Refuge System Administration Act of 1966)

DESCRIPTION OF USE:
(a) What is the use? Is the use a priority public use?
The use is motorized and non-motorized boating. Motorized and non-motorized boating are not a priority public use of the National Wildlife Refuge System under the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd-668ee) as amended by the National Wildlife Refuge System Improvement Act of 1997, however, they facilitate priority public uses.

Refuge visitors use non-motorized canoes, motorized canoes, and other small boats on Carlton Pond WPA waterways to access otherwise inaccessible portions of the waterfowl management area. Some visitors use these activities to support participation in fishing, hunting, environmental education, wildlife photography, and wildlife observation.

(b) Where will the use be conducted?
Motorized and non-motorized boating will be allowed on all open waters of Carlton Pond WPA (map B.31).

Map B.31. Location of undeveloped boat launch at Carlton Pond WPA (see text for details).



(c) When will the use be conducted?
Motorized and non-motorized boating will be allowed year round, when waters are ice-free, from sunrise to sunset, and one hour before and after sunset in support of hunting.

(d) How will the use be conducted?
Motorized and non-motorized boating will be conducted consistent with refuge and State regulations, with some additional restrictions to protect fish, wildlife, and habitat, and to reduce potential conflicts among public uses.

Hand-carry boat access is available at a number of locations both on and off Service-owned lands around Carlton Pond WPA. A car-top boat launch is located on Bog Road where it crosses a finger of Carlton Pond (see map B.30). All boats launched or landed on refuge lands must follow State boating regulations and, if applicable, show registration.

Maine Statute Title 38: 419B-420 prohibits the transport of any aquatic plant or parts of any aquatic plant, including roots, rhizomes, stems, leaves or seeds, on the outside of a vehicle, boat, personal watercraft, boat trailer or other equipment on a public road. Boaters should inspect all watercraft and clean off any aquatic invasive species before and after launching at WPA sites. That cleaning should take place on dry ground well away from the water. Nonnative, invasive plants or animals on boats, trailers, diving equipment, or in bait buckets can disrupt aquatic ecosystems and negatively affect native fish and plant species. Carlton Pond and its associated brooks and streams appear to be relatively free of aquatic invasive plants, and cleaning boats, trailers, and other equipment will help to keep them that way. Small areas of purple loosestrife have been found on Carlton Pond WPA and cleaning of boats will help reduce the chance of spreading loosestrife to new wetlands. Signs, public outreach, and periodic enforcement will help educate and remind the public of the importance of inspecting and cleaning watercraft and Maine State laws prohibiting transport of aquatic plants.

(e) Why is the use being proposed?
Motorized and non-motorized boating are existing uses at Carlton Pond WPA. These uses have been ongoing for many years with little or no observed adverse impacts to refuge habitats or wildlife. In addition, these uses also help facilitate the six priority public uses of the Refuge System: hunting, fishing, wildlife observation and photography, and environmental education and interpretation. By allowing this use, we are providing opportunities and facilitating Service programs in a manner and location that offer wildlife-dependent recreation and maintain the level of current fish and wildlife values. Most of Carlton Pond will be inaccessible to the public without using a boat.

AVAILABLITY OF RESOURCES:
Facilities or materials needed to support boating include periodic law enforcement patrol, biological monitoring, and educational outreach signage.

Estimated costs are as follows:

Law Enforcement Patrol	$3,000.00
Biological Monitoring/resource impact monitoring	$2,000.00
Educational Signage	$ 600.00
Total Estimated Program Cost:	**$5,600.00**

ANTICIPATED IMPACTS OF THE USE:
Because Carlton Pond and its tributaries have limited access for motorized and non-motorized boats, we do not expect a dramatic change from existing conditions. Currently boat and motor size is limited because no launch ramp is available for larger boats; therefore, all boats must be hand-carried to the water. The use is further restricted by seasonal low water levels and dense emergent vegetation around the edges of the pond and bank of its tributaries. In the past 2 years, Service law enforcement patrols have observed consistent low levels of use. Potential impacts of motorized and non-motorized boating include the following:

Accidental introduction of invasive plants, pathogens, or nonnative invertebrates, attached to fishing boats: With the exception of a few isolated occurrences of purple loosestrife, Carlton Pond appears to be relatively free of invasive aquatic plants and mollusks. However, we have not carried out extensive surveys for aquatic invasives. We can mitigate the potential for introductions by educating and encouraging boaters to clean their boats before launching and after retrieving. We will also post launch sites with educational materials and have law enforcement officers make courtesy spot checks of vessels and to educate boaters on proper methods for checking for aquatic hitchhikers.

Disturbance of wildlife (particularly breeding and brood-rearing black terns, waterfowl, and wading birds): Boating seasons in Maine coincide in part with spring and early summer nesting and brood-rearing periods for many species of aquatic birds. Anglers and other boaters may disturb nesting birds by approaching too closely to nests, causing nesting birds to flush. Flushing may expose eggs to predation or cooling, resulting in egg mortality. If this becomes a problem we will close refuge areas seasonally to boating around sensitive nest sites, in conjunction with the State of Maine if necessary. Though motorized boats generally have a greater impact on wildlife, even non-motorized boats can alter distribution, reduce use of particular habitats by waterfowl and other birds, alter feeding behavior and nutritional status, and cause premature departure from areas (Knight and Cole 1995). However, compared to motorboats, canoes and kayaks appear to cause fewer disturbances to most wildlife species (Delong 2002). Most boating at Carlton Pond WPA is non-motorized, and based on 2 years of weekly law enforcement patrols, this use occurs at very low numbers which minimizes potential impacts.

Negative impacts on water quality from motorboat and other pollutants, human waste, and litter: Extensive water quality testing at Carlton Pond and its tributaries has not been carried out. The actual levels of pollutants from boat fuel and impacts on local aquatic systems are unknown. Hydrocarbon contamination can be harmful to fish. Currently most boating is non-motorized so we believe there is little contamination coming from this source. We will initiate public outreach and education on littering, pollutants, and proper waste disposal if the use increases substantially above current use levels to help mitigate potential adverse impacts to water quality. Water quality testing will be carried out, dependent on staff and funding.

Bank erosion from human activity (boat landings, boat wakes) may increase aquatic sediment loads of streams and rivers, or alter riparian or streamside habitat and vegetation in ways harmful to fish or other wildlife. Boat access will be restricted to designated areas only. Access sites will be located near existing roads and access points, away from sensitive areas. The majority of boat use that occurs on Carlton Pond is non-motorized, primarily canoes and kayaks. When motorboats are used, they are either low horsepower or electric trolling motors; therefore, we do not anticipate any bank erosion due to boat wakes.

Negative impacts from fishing boats and foot traffic to sensitive wetlands and rare wetland plants. Boat access sites will be located away from sensitive wetlands and rare plants.

Conflicts between boaters and other user groups: We know that a small number of conflicts among boaters and other users have arisen at Carlton Pond in the past. In addition, local land owners have expressed concerns about trespass and vehicles parking in inappropriate places and the disposal of human waste by boaters. We will continue to monitor for conflicts among users. If we determine conflicts among users are sufficient to cause safety concerns or affect the overall quality of visitor experiences, we will reevaluate the relevant compatibility determinations and may modify them to reduce conflicts or ensure public safety. Actions we may take to minimize conflicts among user include: 1) providing additional education and outreach, or 2) separating user groups spatially (i.e., different parts of the WPA are open to different activities) or temporally (the WPA would be closed to certain activities at certain times of day or during certain seasons).

To summarize, our continued monitoring of invasive species and outreach at launching sites is necessary to minimize impacts on refuge habitats, plant, and wildlife communities. Monitoring will identify any actions needed to respond to new information and correct problems that may arise in the future. Boating will support the mission of the Refuge System by facilitating participation in the six priority public uses.

PUBLIC REVIEW AND COMMENT:
As part of the comprehensive conservation plan (CCP) process for Sunkhaze Meadows National Wildlife Refuge and Carlton Pond WPA, this compatibility determination was available for public review and comment for 39 days concurrent with the release of our draft CCP and environmental assessment.

DETERMINATION (check one below):
This use is compatible __X__

This use is not compatible _____

STIPULATIONS NECESSARY TO ENSURE COMPATIBILITY:

- Boating access areas will be designated and signed.

- Service staff will continue to monitor the refuge for the presence of threatened or endangered species and ensure that boat use has no significant impact on these species. If needed in the future, closure of areas will be coordinated with the State of Maine.

- Motor or speed limitations could be implemented if wake or speeds become harmful to wildlife or habitat, or in the interest of public safety.

- Jet Skis will not be permitted on WPA waters due to their environmental impact, noise, speed, and excessive wildlife disturbance.

- All users will be encouraged to inspect and clean boats, trailers, motors, and fishing gear for plant material prior to launching and after retrieval.

- Compliance with regulations and these stipulations will be achieved through education, signage, and law enforcement which will result in minimizing negative impacts to refuge habitat and wildlife.

- The WPA will be open to boating sunrise to sunset and access to any restricted areas will be enforced.

JUSTIFICATION:
Allowing boating at the WPA will not materially interfere with, or detract from, the mission of the National Wildlife Refuge System of the purposes for which the WPA was established. As listed in the purposes section of this compatibility determination, the WPA was established and subsequently land was acquired for two main purposes. Boating will not materially interfere with or detract from the WPA's purposes for several reasons. First, as discussed under the section on anticipated impacts above, boating is a use that supports wildlife-dependent priority public uses with minimal adverse impacts on refuge resources. Use by boaters, based on 2 years of weekly law enforcement patrols, is low and is expected to remain low. This is due largely to numerous other opportunities in the area. Second, waterfowl tend to congregate in emergent vegetation on the wetland edges away from the main waterway used by boaters, so minimal and temporary disturbance of waterfowl is anticipated from boating activity. Third, erosion of stream banks by wakes from motorized boats has not been observed since most boating is non-motorized and dense vegetation and thickly matted roots protect the wetland banks. Therefore, boating is consistent with the wildlife and habitat aspects of the WPA's purposes, the Service policy on compatible uses, the National Wildlife Refuge System Improvement Act of 1997, and the broad management objectives of the National Wildlife Refuge System.

By supporting priority public uses, allowing this use supports CCP goals and objectives as described in the refuge's and WPA's CCP (USFWS 2013). This activity will not materially interfere with or detract from the mission of the Refuge System because of the limited impacts to WPA resources, it facilitates priority public uses, and the opportunity to attract visitors to the WPA and build support for the Refuge System.

SIGNATURE:

Refuge Manager: Beth Goettel (Signature) 8/19/2013 (Date)

CONCURRENCE:

Regional Chief: Scott B. Kahn (Signature) 9/17/2013 (Date)

MANDATORY 10 YEAR RE-EVALUATION DATE: 9/17/2023

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