

Draft Compatibility Determination

Title

Compatibility Determination for Environmental Education and Interpretation, Fisherman Island National Wildlife Refuge.

Refuge Use Category

Environmental Education and Interpretation

Refuge Use Type(s)

Environmental Education (National Wildlife Refuge System staff and authorized agents), Interpretation (NWRS staff and authorized agents)

Refuge

Fisherman Island National Wildlife Refuge (NWR)

Refuge Purpose(s) and Establishing and Acquisition Authority(ies)

...particular value in carrying out the national migratory bird management program. 16 U.S.C. § 667b (An Act Authorizing the Transfer of Certain Real Property for Wildlife, or other purposes)

... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds... 16 U.S.C. 715d (Migratory Bird Conservation Act)

National Wildlife Refuge System Mission

The mission of the National Wildlife Refuge System, otherwise known as Refuge System, is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans (Pub. L. 105-57; 111 Stat. 1252).

Description of Use

Is this an existing use?

Yes

The uses are environmental education and interpretation which are priority public uses, as identified in the National Wildlife Refuge System Improvement Act (USFWS1997).

What is the use?

The uses under this Compatibility Determination (CD) are Environmental Education and Interpretation conducted by Refuge System staff, interns, and volunteers, and authorized agents which may include state and non-governmental organization partners. These are priority public uses identified by Executive Order 12996 (March 25, 1996) and legislatively mandated by the Refuge System Administration Act of 1966 (16 U.S.C. sections 668dd-668ee), as amended by the Refuge System Improvement Act of 1997 (Public Law 105-57).

Refuge staff and volunteers conduct environmental education programs for small groups, but also for organized groups, including school, scout, youth, and nature-based groups. Programs may include birding field trips, and guided tours about the refuge's management practices. Refuge staff coordinate all on- and off-site environmental education programs with refuge volunteers and partners, and programs are delivered as time and volunteer availability allow.

Refuge staff, volunteers, teachers, and other youth group leaders conduct interpretive programs by way of personal presentations and guided tours; and at special events and displays both on and off the refuge.

Refuge staff provide educational and interpretive information via signage, kiosks, printed information, exhibits, websites, social media, and other methods to reach targeted audiences.

Is the use a priority public use?

Yes

Where would the use be conducted?

Environmental education and interpretation activities are conducted along a 1.5-mile unimproved trail on Fisherman Island NWR that goes from the parking area by the Chesapeake Bay Bridge Tunnel (Bridge-Tunnel) to the Chesapeake Bay and along the beach. Visitors learn about the U.S. Fish and Wildlife Service and the important role Fisherman Island NWR plays in wildlife and critical habitat protection (please visit the refuge website for a map of the refuge: <https://www.fws.gov/refuge/fisherman-island>).

When would the use be conducted?

Guided tours may be offered on Fisherman Island NWR from October 1 to February 28 during select hours and days. Limited programs conducted under direct staff escort or under the provisions of a special use permit may occur on rare occasions other times of the year once annual bird nesting has concluded (generally 45 days after fledging for shorebirds) or if it is determined that no disturbance will occur.

How would the use be conducted?

The staff and volunteers at the Eastern Shore of Virginia NWR conduct educational programs and guided interpretative walks on Fisherman Island NWR. Tours will be guided by refuge staff and/or volunteers. Participants must reserve a tour in advance by calling the refuge office. Due to limited parking and to minimize disturbance, tours will be limited to no more than 30 people at a time. These tours are popular with the local community, schools, and individuals traveling through the area. Dependent on inclement weather and staffing availability, tours are typically booked for every Saturday from October 1 to February 28.

Why is this use being proposed or reevaluated?

Environmental education 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 if compatible, are to receive enhanced consideration over other general public uses. This use is being reevaluated pursuant to policy (603 FW 2.11 H.). This compatibility determination reviews and replaces the 2004 compatibility determination for Environmental Education, Interpretation, Wildlife Observation, and Photography.

These uses will provide experiences for visitors to observe and learn about wildlife and wildlands and to observe wildlife habitats firsthand, enhancing visitors' understanding of natural resource management programs and ecological concepts, fostering a better understanding of the problems facing our wildlife/wildlands resources including the effects the public has on wildlife resources. Environmental education and interpretation opportunities allow visitors to learn about the U.S. Fish and Wildlife Service role in conservation, to better understand the biological facts upon which U.S. Fish and Wildlife Service management programs are based and foster an appreciation for the importance of wildlife and wildlands. We anticipate that participation in these uses will result in a more informed public, with an enhanced stewardship ethic and enhanced support and advocacy for wildlife conservation.

Furthermore, Department of the Interior Secretarial Order 3356 directs the Service to enhance and expand public access to lands and waters on national wildlife refuges for hunting, fishing, recreational shooting, and other forms of outdoor recreation. The proposed action promotes two of the priority public uses of the Refuge System and provides opportunities to promote stewardship of our natural resources and increase public appreciation and support for the refuge.

Availability of Resources

Environmental Education and Interpretation of natural and cultural resources occur through the use of existing staff, resources, and facilities. Existing resources such as

interpretive kiosks/displays, and programs to the public, are made possible through extensive help of staff, volunteers, and partners. The amount of environmental education and interpretive programming provided to the public will be a direct reflection of the refuge's staff and funding levels and/or volunteer and partner capabilities.

The Refuge Manager or Project Leader will use sound professional judgement to determine the staffing needed to perform the functions necessary to ensure compatibility. Refuge staff are needed to administer activities such as visitor programs, maintaining trails and signage, issuing special use permits, and monitoring impacts related to environmental education and interpretation uses. The funding resources needed to provide this use are available under the current refuge budget. However, adequate levels of refuge staffing, funding, and facilities are necessary to administer this use in a manner that ensures continued compatibility (603 FW2 2.11(A.2)). Therefore, if staffing levels or budgets decrease and alternate resources cannot be found to facilitate environmental education and interpretation activities, the Refuge Manager or Project Leader may need to re-evaluate whether these uses are still compatible with refuge purposes and the Service's mission.

Anticipated Impacts of the Use

Potential impacts of a proposed use on the refuge's purpose(s) and the Refuge System mission

The effects and impacts of the proposed use to refuge resources, whether adverse or beneficial, are those that are reasonably foreseeable and have a reasonably close causal relationship to the proposed use of Environmental Education and Interpretation. This CD includes the written analyses of the environmental consequences on a resource only when the impacts on that resource could be more than negligible and therefore considered an "affected resource." Resources that will not be more than negligibly impacted by the action, including geology, hydrology, air and water quality, threatened and endangered species, cultural resources, and socioeconomics have been dismissed from further analyses.

Environmental education and interpretation can result in varying impacts to wildlife resources, both positive and negative. These uses represent two of the six priority public uses designated in the National Wildlife Refuge Improvement Act of 1997 (hunting, fishing, environmental education, interpretation, wildlife observation and photography). These wildlife-dependent uses promote public understanding and appreciation of the National Wildlife Refuge System. Recreational visitation and associated economic contributions made to local and state economies provide a powerful catalyst for conserving public lands (Marion 2019).

Damage to ecosystems is known to occur when informal trails are created and used by the public (Barros and Pickering 2017). Visitors engaging in interpretation and

environmental education activities will be expected to use and stay on designated trails or roads and are not allowed to touch or remove wildlife from the refuge without the appropriate permit or license. Disturbances associated with these two public uses vary with the wildlife species present and the type, level, frequency, duration, and the time of year such activities occur.

There are many recommendations for reducing impacts to wildlife: provide visitor education, require staying on trails, closing areas during sensitive periods such as nesting, require minimum set back distances for approach to areas such as rookeries, etc. (Boyle et al. 1985, Erwin 1989, Haverra et al. 1992, Klein 1993, Miller et al. 2001, Morton et al. 1989, Rodgers et al. 1995, Taylor and Knight 2003).

Short-term impacts

Short-term impacts resulting from anthropogenic disturbance from visitors engaging in environmental education and interpretation activities may include changes in wildlife behavior, distribution, or abundance (Leblond et al. 2013). Trails used to facilitate environmental education and interpretation can disturb wildlife outside the immediate trail corridor (Trails and Wildlife Task Force 1998, Miller et al. 2001). Noise caused by visitors engaging in environmental education and interpretation activities can result in increased levels of disturbance, though noise is not always correlated with visitor group size (Burger 1986, Klein 1993, Burger and Gochfeld 1998).

Extensive research has been conducted on the impacts of human disturbance on birds. Gutzwiller et al. (1994) found that the singing behavior of some species of songbirds was altered by low levels of human intrusion. Pedestrian travel has the potential to impact shorebirds, waterfowl, and other migratory birds feeding and resting near the trails and on beaches, especially during the nesting and migration seasons. Birds may avoid places where people are present and when visitor activity is high (Burger 1981, 1986; Klein et al. 1995). 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. Nest predation was also found to be greater near trails (Miller et al. 1998).

Wildlife interpretation and environmental education programming has the potential to impact fish and other aquatic species if activities generate noise in the water, increase turbidity, or result in other physical disturbance in the aquatic environment. For example, when exposed to noise events, bass and bull head fish spent less time guarding nests and fry exposing eggs and young to potential predators (MacLean et al. 2020, Maxwell et al. 2018, Mickle et al. 2018).

Human disturbance from environmental education and interpretation uses on the refuge also has potential short-term impacts on mammals. There is evidence to suggest that the mammal species most likely to be adversely affected by human disturbance are those for which 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). For example, disturbances causing mammals to flee during winter months could consume stored fat reserves that are necessary to get through the winter. Additionally, George and Crooks (2006) found that bobcats and coyotes were more active at sites with less human use and less active at sites with high levels of human recreation. This study also found that bobcats were detected less frequently in high human use areas, and even temporarily shifted their activity patterns to become more nocturnal.

In addition to direct impacts on wildlife, environmental education and interpretation can also have indirect impacts on wildlife by altering vegetation and habitat on a short-term basis. Immediate effects can include soil compaction from trampling, changes to vegetation structure, and accumulating waste from litter. By altering these habitat characteristics, visitors can modify the food supply or availability of shelter for wildlife (Cole and Landres 1995). Modes of transportation along roads and foot traffic on trails and at established environmental education and interpretation sites can compact soil leading to increased erosion and sedimentation (Cooke and Xia 2020), resulting in degraded habitat for wildlife.

Quantitative research documenting the impacts of environmental education and wildlife interpretation uses on other user groups such as hunters and anglers is scant. Crowding from these uses may deter some recreationists; these individuals may alter their time or location of visitation or develop other coping mechanisms, such as rationalization or shifting their understanding of the activity or place (Manning and Valliere 2001, Marcouiller 2008). Potential positive impacts of environmental education and interpretation include a deepened sense of place, heightened appreciation for the refuge's habitat and wildlife, and inspired engagement in conservation efforts (Ardoin 2006, Kudryavtsev et al. 2012).

Many shorebirds that nest, migrate, or overwinter in the United States are in decline and are of conservation concern due to threats and pressures they experience throughout their annual cycle. Since 1970, shorebird abundance across North America has declined by 37% (Rosenberg et al. 2019) and those declines are accelerating over time (Smith et al. 2023). Human disturbance has been identified as a major threat and a key mortality source for shorebirds, especially in the Northeastern U.S. (AFSI 2015, NABCI 2022). Disturbance can be defined as “a human activity that causes an individual or group of shorebirds to alter their normal behavior, leading to an additional energy expenditure by the birds. It disrupts or prevents shorebirds from effectively using important habitats and from conducting the activities of their annual cycle that would occur in the absence of humans. Productivity and survival rates may also be reduced” (Mengak and Dayer 2020). Human disturbance can be caused by both intentional and unintentional actions, including environmental education and interpretation activities. Unfortunately, the impacts of disturbance will likely increase in the future as the human population in coastal areas is projected to grow (NOAA 2013) and as shorebird habitats decrease due to coastal development and sea-level rise driven by climate change (Galbraith et al. 2002).

Disturbance can impact shorebirds throughout the entire annual cycle. During the breeding season, disturbance can affect how shorebirds use habitat, as well as their reproductive success and survival. Human disturbance has been found to exclude shorebirds from habitat they would otherwise use for nesting and to cause adults to incubate or attend their nests less frequently, which can result in reproductive failure when nests are left unprotected from temperature fluctuations or predators (Lafferty et al. 2006, Sabine et al. 2008). Additionally, human activity can cause direct mortality of adults, chicks and eggs, such as trampling (Melvin et al. 1994, Ruhlen et al. 2003, Schulte and Simons 2015).

Disturbance during the non-breeding season, which involves a period of migration, can also have significant impacts on the survival and fitness of shorebirds. Migration is an energetically demanding activity that requires sufficient food resources and stopover sites where birds can rest and forage, and many such stopover sites occur in the Northeastern U.S. (Colwell 2010, Linscott and Senner 2021). Disturbance can cause shorebirds to fly away, displace them from important habitats, and reduce their foraging time and feeding rates (Burger and Gochfeld 1991, Burger and Niles 2014, Burger et al. 2004, Navedo et al. 2019, Pfister et al. 1992). The cumulative result of these impacts can be a severe energetic cost for individual birds, such as reduced body mass, and can lead to lower annual survival rates of individuals at disturbed sites (Gibson et al. 2018, Rogers et al. 2006). When extrinsic factors, such as disturbance, are experienced by shorebirds during the non-breeding season, their ability to reproduce during the breeding season can be influenced (Weithman et al. 2017).

Long-term impacts

Located on the Delmarva Peninsula, Fisherman Island NWR hosts a wide diversity of both resident and migratory wildlife. The refuge is an important stopover site in the Atlantic flyway and provides important habitat for resident species in an area with rising development trends. Avian Priority Refuge Resources of Concern identified in the Habitat Management Plan (HMP) occurring on Fisherman Island NWR during the breeding, migration, and/or winter seasons include fall migratory landbirds, American woodcock, Prairie warbler, Piping plover, staging terns, American oystercatcher, migrating shorebirds, Seaside sparrow, Saltmarsh sparrow, American black duck, Clapper rail, and Eastern meadowlark. Many of these species are not in the area during the timeframe that tours will be offered or occupy habitat that would not be directly impacted by the tour route, such as tidal saltmarsh. Guided tours, which provide wildlife - environmental education and interpretation, are scheduled for October to the end of February to limit or avoid disturbance to these and other species. Following is an overview of potential impacts on wildlife species that are present.

The long-term effects of environmental education and interpretation activities on species will vary depending on their biology and life history. For example, the same education programming offered during different seasons—for example, during

breeding, migration, or wintering for migratory birds—may differ greatly in its impact. Examples include education and interpretation programs causing birds to flush during nesting (Carney and Sydeman 1999) or causing mammals to flee during winter months, thereby consuming large amounts of stored fat reserves necessary for survival (Lovegrove 2005).

The presence of humans participating in environmental education and interpretation could also lead to human-induced avoidance by wildlife, which can prevent animals from using otherwise suitable habitat. Frequent disturbance may cause shifts in habitat use, abandonment of habitat, and increased energy demands on affected wildlife as reviewed in Kerlinger et al. 2013. 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” such as wildlife becoming habituated to humans.

Additional potential long-term impacts from environmental education and interpretation uses include changes at the community and ecosystem scale. Frequent use of areas or trails for environmental education and interpretation activities could alter species composition in the immediate areas utilized for these activities. For example, generalist bird species are typically more abundant near trails, whereas specialist species are less common (Miller et al. 1998).

There is a large amount of research available for the long-term impacts of human disturbance on bird species. Environmental education and interpretation programs that incorporate activities such as bird watching should consider and monitor the duration and proximity of the encounters. Some birds will tolerate the presence of people, but there is a distance beyond which closer interactions will cause disturbance or disruption, and may lower reproductive success, decrease foraging efficiency, or force birds to abandon suitable habitats (Burger et al. 1995). Each situation requires observation, continued monitoring and mitigation by refuge staff to avoid undue stress and long-term impacts. In many refuges, paths or boardwalks are used to direct the flow of birdwatchers or others observing wildlife. In others, some of the habitats may need to be closed during a sensitive part of the year (e.g., beach closure for piping plovers or closed areas around bald eagle nests), with sensitive areas fenced to prevent human access. Negative impacts of environmental education and interpretation activities and other ecotourism can be curtailed with careful management and consideration of the needs of both the wildlife and the visitors (Burger et al. 1995).

Long-term impacts from environmental education and interpretation could also have impacts on mammals present on the refuge. With respect to mammalian carnivores, Baker and Leberg (2018) found that coyotes and bobcats had higher occupancy in protected areas with more human disturbance (i.e., trails) but overall, protected areas with less human disturbance had greater carnivore community diversity. Their results varied among species, however, the general trend showed that human activity can have long-term impacts on carnivores. Reed and Merenlender (2008) found that

human activity decreased carnivore density and shifted community composition significantly from native species to non-native species.

In addition to direct long-term wildlife impacts, environmental education and interpretation can also have long-term indirect impacts by altering wildlife habitats. Habitat fragmentation caused by physical barriers necessary to facilitate environmental education and interpretation, such as roads or trails, may reduce potential habitat for dispersal, as well as decrease the availability of water and food, and ultimately reduce biodiversity (Haddad et al. 2015). Fragmentation may ultimately lead to smaller population sizes within each fragment, and increased vulnerability to population decline and extinction (Fahrig and Merriam 1994). Reducing the survival of vegetation could have cascading impacts for herbivores and possibly higher trophic levels (Haddad et al. 2015).

Visitors can unintentionally introduce invasive plants, animals, and pathogens to habitats (Anderson et al. 2015, Brock and Green 2003, Davies and Sheley 2007, Marion et al. 2006). Once present, invasive species can outcompete native plants and animals, thereby altering habitats (Anderson et al. 2015, Marion et al. 2006). Invasive species can alter native animal and plant species composition, diversity, and abundance (Davies and Sheley 2007, Eiswerth et al. 2005). These changes may reduce native forage, cover, and water sources (Brock and Green 2003, Eiswerth et al. 2005). Certain invasive species may even impede access to interpretation and environmental education sites such as hydrilla blocking waterways.

Fisherman Island NWR is closed to the public for the majority of the year to maintain a sanctuary for breeding and migrating shorebirds. Offering guided tours of the refuge predominately from October to the end of February eliminates overlap during the breeding season and the majority of the migration season. Tours take place on the unimproved trail and the beach to the Bridge – Tunnel which limits disturbance to wintering shorebirds as this small section of beach is not a preferred roost site.

Impacts to vegetation are expected to be minimal as the use will only take place along the unimproved trail/access road, which is sand and loose stone, and below the high tide line on the beach. Species that may be found on the refuge include piping plover, red knot, roseate tern, black rail, and five species of sea turtles. While not federally listed as a threatened or endangered species, bald eagles (*Haliaeetus leucocephalus*) can be found nesting on or near the refuge and are protected by the Bald and Golden Eagle Protection Act. The Service's Virginia Field Office has designated Bald Eagle focal areas for the State, but none fall within refuge lands. There is a Bald Eagle nest approximately 50ft off the unimproved trail that serves as the access route to the beach for tours. This nest has only been active since approximately 2019.

Environmental education and interpretation are not likely to adversely affect Federally listed species given the time of year the uses will take place (October 1 to February 28) does not overlap with the breeding and migration season of these

species. In addition, these uses will take place on a very small portion of the island and will not overlap significantly with habitat where these species are typically found at the time of year that guided tours will be offered.

However, because bald eagle nesting does overlap when and near where the use will occur, allowing only limited guided tours and programs will ensure that disturbance can be monitored and that the nesting bald eagles will not be unduly disturbed. If disturbance to the existing eagle nest becomes evident, the tours will be rerouted or cancelled and the beach to the Bridge – Tunnel which limits disturbance to wintering shorebirds as this small section of beach is not a preferred roost site.

Public Review and Comment

The draft compatibility determination will be available for public review and comment for 14 days. The public will be made aware of this comment opportunity through posting at refuge headquarters, posting on the refuge website, and social media. State and Tribes have been asked to review and comment on the compatibility determination. A hard copy of this document was posted at the Refuge Headquarters or Visitor Center located at 5003 Hallett Circle Cape Charles, VA 23310. It was also made available electronically on the refuge website https://www.fws.gov/refuge/eastern_shore_of_virginia/. Please contact the Refuge Manager if you need the documents made available in an alternative format. Concerns expressed during the public comment period will be addressed in the final document.

Determination

Is the use compatible?

Yes

Stipulations Necessary to Ensure Compatibility

1. Some areas of the refuge will be closed to this use during nesting season to minimize disturbance to beach nesting birds. Refuge staff will install symbolic fencing to restrict access and maintain a buffer of space in these areas to minimize disturbance to beach nesting birds.
2. Refuge staff will conduct biological inventories, including physical condition of the beachfront, dunes, and trail system, and routine monitoring, to measure change in use of the habitat by beach nesting or migrating shorebirds. If monitoring, evaluation, or observations indicate a change or negative impact on beach nesting birds, shorebirds resting during migration, or their habitat, the refuge manager will take appropriate action to modify or discontinue the use.

Justification

The stipulations outlined above would help ensure that the use is compatible at Fisherman Island NWR. Environmental education and interpretation, as outlined in this compatibility determination, would not conflict with the national policy to maintain the biological diversity, integrity, and environmental health of the refuge. Based on available science and best professional judgement, the U.S. Fish and Wildlife Service has determined that the Environmental Education and Interpretation at Fisherman Island NWR, in accordance with the stipulations provided here, would not materially interfere with or detract from the fulfillment of the Refuge System mission or the purpose of the Fisherman Island NWR. Rather, appropriate and compatible Environmental Education and Interpretation would be the use of the Fisherman Island NWR through which the public can develop an appreciation for fish, wildlife, and wild lands. These priority public uses identified by Executive Order 12996 (March 25, 1996) and legislatively mandated by the Refuge System Administration Act of 1966 (16 U.S.C. sections 668dd-668ee), as amended by the Refuge System Improvement Act of 1997 (Public Law 105-57), have been found appropriate and compatible, and will provide opportunities through which the American public can develop an appreciation for fish and wildlife and contribute to achieving the mission of the Refuge System.

Signature of Determination

Refuge Manager Signature and Date

Signature of Concurrence

Assistant Regional Director Signature and Date

Mandatory Reevaluation Date

2040

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