

Draft Compatibility Determination

Title

Draft Compatibility Determination for Environmental Education and Interpretation,
Canaan National Wildlife Refuge.

Refuge Use Category

Environmental Education and Interpretation

Refuge Use Type(s)

Environmental education (National Wildlife Refuge System staff and authorized agents), Environmental education (general), Interpretation (National Wildlife Refuge System staff and authorized agents), Interpretation (commercial)

Refuge

Canaan Valley National Wildlife Refuge (NWR)

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

Canaan Valley NWR was established by the U.S. Fish and Wildlife Service (USFWS, the Service) in 1994 to ensure the ecological integrity of Canaan Valley and the continued availability of its wetland, botanical, and wildlife resources to the citizens of West Virginia and the United States. The wetlands at the valley's core encompass over 8,400 acres and represent the largest wetland complex in both West Virginia and the central and southern Appalachians. Canaan Valley is listed as a priority for protection under the Emergency Wetlands Resources Act of 1986, as implemented by the Service's Regional Wetlands Concept Plan, and considered by the state of West Virginia as "the most important wetland in the State." (WVDNR 2006)

The Service established the refuge for the following purposes and under the following authorities:

"... for the development, advancement, management, conservation, and protection of fish and wildlife resources..." (Fish and Wildlife Act of 1956; 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)

"... the conservation of the wetlands of the Nation in order to maintain the public benefits they provide and to help fulfill international obligations contained in various migratory bird treaties and conventions" (Emergency Wetlands Resources Act of 1986;

16 U.S.C. 3901(b));

“... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds” 16 U.S.C. 715d (Migratory Bird Conservation Act of 1929).

National Wildlife Refuge System Mission

The mission of the National Wildlife Refuge System (NWRS), 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

This Compatibility Determination (CD) reviews and replaces the 1994 CD for Environmental Education and Interpretation use on Canaan Valley National Wildlife Refuge.

What is the use?

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.

The Canaan Valley NWR Visitor Services Action Plan 2023-2028 outlines the process by which environmental education programming will be provided.

The refuge hosts environmental education programming such as Wild School to targeted community schools an informative social media presence, volunteer and staff-led programs, community events, and upon request to partner groups on a case-by-case basis. The Friends of the 500th help the refuge deliver these programs.

Educational programming at the refuge is valuable for all ages groups. Thus, we also propose the inclusion of interpretive walks led by volunteer guides that involve environmental education on refuge lands. Scheduled guided interpretive walks are intended to provide education for families and other small groups.

Environmental education (not conducted by NWRS staff or authorized agents). On-refuge activities not conducted by NWRS staff or authorized agents that use a planned

process to foster awareness, knowledge, understanding, and appreciation in students, teachers, or group leaders about fish, wildlife, plants, ecology, natural sciences (such as astronomy) and refuge management.

Environmental education (NWRS staff and authorized agents). On-refuge activities conducted by NWRS staff or authorized agents that use a planned process to foster awareness, knowledge, understanding, and appreciation in students about fish, wildlife, plants, ecology, natural sciences (such as astronomy) and refuge management.

Environmental education (general). Environmental education activities not specifically defined elsewhere in this category.

Interpretation (NWRS staff and authorized agents). On-refuge activities for refuge visitors conducted by NWRS staff or authorized agents that are designed to foster an understanding and appreciation for natural and cultural resources, and associated management.

Interpretation (not conducted by NWRS staff or authorized agents). On-refuge activities for refuge visitors not conducted by NWRS staff or authorized agents that are designed to foster an understanding and appreciation for natural and cultural resources, and associated management.

Interpretation (commercial). Commercially guided interpretive tours (including bus or bicycle tours) of the refuge where fees can be collected.

Is the use a priority public use?

Yes

Where would the use be conducted?

Many visitors use the Freeland Boardwalk located in the southern extent of the refuge; one of over a dozen developed trails on the refuge. Other trails available include Chris Clower Trail, Brown Mtn Overlook Trail, Valley overlook trail, Sand Run Trail, South Glade Run, Wilderness Way, Idleman's Run, Beall Lane, Beall South Trail, Fish Hook Trail, Rivers Edge trail, Blackwater View Trail, Middle Valley Trail, Cabin Mountain Trail.

Environmental education is conducted on refuge, mainly at the refuge Visitor Center and Freeland Boardwalk, and may be conducted off refuge, such as at local school settings. It may be conducted at additional locations in the future depending on budgetary and personnel availability.

Technology is a useful tool to engage emerging audiences and inspire the next generation of conservation stewards. We incorporate apps such as Merlin, iNaturalist, Seek and eBird into our environmental education programming to be conducted across the refuge and throughout the community.

When would the use be conducted?

The refuge is open each day from an hour before sunrise to hour after sunset (i.e., daylight hours only), unless otherwise specified. Refuge staff and/or partners may conduct interpretive programs on topics such as nocturnal wildlife and/or astronomy outside of normal refuge operational hours. These programs occur infrequently and may require the issuance of a Special Use Permit (SUP) by the Refuge Manager.

How would the use be conducted?

Refuge staff allow these priority uses only on designated refuge waters, nature trails and biking trails.

Refuge staff do not limit the total number of visitors at the refuge. Refuge staff accommodate these priority uses on the refuge and ensure their compatibility in accordance with the stipulations below. Organized groups larger than 25 individuals may be required to obtain a Special Use Permit (SUP) from the Refuge Manager prior to their visit to promote efficient administration of this use and to ensure a quality visit for all visitors.

Commercial tours will be authorized and managed by SUP. Participants in commercial tours would pay a fee to a Service conservation partner, concessionaire, or private business to guide, supervise, and provide them with interpretative, educational, and photographic opportunities on the refuge.

Visitors primarily access interpretive content for Canaan Valley NWR through the refuge web site ([Canaan Valley National Wildlife Refuge | U.S. Fish & Wildlife Service](#)) and Facebook page ([Canaan Valley National Wildlife Refuge | Davis WV | Facebook](#)).

The refuge will continue to host programming by the Friends of the 500th as they develop and grow their programming and capacity.

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 since the refuge has hired a Visitor Services park ranger and is working to expand Environmental Education and Interpretation.

Environmental education and interpretation have been conducted on the refuge since the refuge was established in 1994. The use was evaluated in conjunction with the Canaan Valley NWR Comprehensive Conservation Plan (CCP 2011) and found to be compatible.

There are interpretive materials developed and posted at the refuge Visitor Center as

well as at key access points such as Freeland Boardwalk, Beall Lane, Forest Road 80, Camp 70 Road, and A-Frame Road. This use is being proposed as a means to connect people with nature using tested methods that can inspire the next generation of conservation stewards, and gain community support.

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

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, Haverro 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 interpretation and environmental education 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.

For northern long-eared bats and tricolored bats, no known maternity roost trees or hibernaculum are located on lands within the Canaan Valley NWR boundaries. Bats may be disturbed due to the presence of large groups but this is highly unlikely due to their nocturnal behavior.

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).

Long-term impacts

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.

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 social media, posting at refuge headquarters, publication of notice in local newspaper, and sending a letter to the refuge email list. State and Tribes have been asked to review and comment on the draft compatibility determination. A hard copy of this document will be posted at the Refuge Headquarters or Visitor Center located at 6263 Appalachian Hwy, Davis, WV 26260. It will be made available electronically on the refuge website <https://www.fws.gov/refuge/canaan-valley>. 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. If monitoring or observations indicate an adverse impact from Environmental Education and Interpretation activities on wildlife or their habitat, the refuge manager will take appropriate action to modify or discontinue the use in some or all areas of the refuge.
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 Canaan Valley 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 Canaan Valley 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 Canaan Valley NWR. Rather, appropriate and compatible Environmental Education and Interpretation would be the use of the Canaan Valley 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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