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Environmental Assessment

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Vegetation Management Activities
Meadowood Special Recreation Management Area (SRMA)

Date:	June 2016
Type of Action:	Vegetation Management
Location:	Meadowood SRMA, Lorton, Virginia
Project Acreage:	804

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Technical Review.

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1. Purpose and Need for the Proposed Action

1.1. INTRODUCTION AND BACKGROUND

The Bureau of Land Management (BLM) Meadowood Special Recreation Management Area (SRMA) in Lorton, Virginia consists of a mix of woodlands, wetlands, pastures, stream valleys, and developed areas that include offices, equipment storage, and equestrian facilities. The SRMA is used for various types of recreation, environmental education, horse boarding, and wild horse and burro adoptions.

1.2. PURPOSE AND NEED FOR THE PROPOSED ACTION

The purpose of the proposed action is to maintain, enhance, and restore native plant communities and productive pastures throughout the SRMA. The action is needed because, without the use of a variety of vegetation management activities to control invasive species, as well as species that do not conform to the goals of the SRMA, they will proliferate throughout the SRMA and potentially into other lands throughout the Mason Neck Peninsula.

1.3. CONFORMANCE WITH BLM LAND USE PLAN(S)

These actions are in conformance with the Meadowood Farm Proposed Planning Analysis Environmental Assessment (approved March 2003)(BLM, 2002), which states on page 2-4, "Exotic, invasive species will be addressed in accordance with the National Invasive Species Act and the Executive Order on Invasive Species of 1999."

These actions are in conformance with the Meadowood Special Recreation Management Area Integrated Activity Management Plan/Environmental Assessment (BLM, 2004), which states on page 24, "BLM will develop a weed management strategy which includes measures to remove and reduce the spread of exotics and invasive species, and replace them with appropriate native plant species."

These actions are in conformance with the Eastern States Fire Management Plan (BLM, 2014) which states that prescribed fire will be used to control invasive species in up to 150 acres of grasslands over the next ten years.

1.4. RELATIONSHIPS TO STATUTES, REGULATIONS AND OTHER PLANS

1.4.1 Executive Order 13112 – Invasive Species

Executive Order (EO) 13112 directs federal agencies to use their authorities to "(i) prevent the introduction of invasive species; (ii) detect and respond rapidly to and control populations of such species in a cost-effective and environmentally sound manner; (iii) monitor invasive species populations accurately and reliably; (iv) provide for restoration of native species and habitat conditions in ecosystems that have been invaded; (v) conduct research on invasive species and develop technologies to prevent introduction and provide for environmentally sound control of invasive species; and (vi) promote public education on invasive species and the means to address them." The proposed action is entirely consistent with the directives provided in EO 13112.

1.5. SCOPING AND ISSUES

The BLM posted the proposed project on the BLM National NEPA Register at https://eplanning.blm.gov/epl-front-office/eplanning/nepa/nepa_register.do in March 2016. The BLM elected not to conduct external scoping. The BLM made this determination because the proposed action consists of methods and tools that have been tested and found to be safe and effective and that are widely used on public lands surrounding the Meadowood SRMA. The BLM interdisciplinary team identified the following issues to be considered in this EA:

1. The use of prescribed fire may trigger health problems among people who are sensitive to smoke and elevated levels of particulate matter.
2. The use of various land management tools carries risks to the health and safety of workers and visitors to work areas.
3. The use of herbicides may affect the accessibility of recreational trails.

2. Alternatives

2.1. Introduction

The goal of an Integrated Pest Management (IPM) program for the SRMA and other public lands is to control target species so that they do not significantly degrade the quality of the SRMA for the public use, wildlife habitat, and other uses that are specified in the Meadowood Farm Proposed Planning Analysis (approved March 2003)(BLM, 2002). A list of the primary target plant species is in Table 1. There are control methods for each species the BLM would expect to use on the SRMA (Table 1); however, methods would be selected on a site-by-site basis to ensure safe, effective, and economical treatments.

Table 1. Common target invasive plant species and recommended control methods

Common name	Scientific name	Foliar herbicide application	Stump/basal bark herbicide application	Cutting/mowing/ pulling	Smothering	Prescribed fire	Biological control
Trees, shrubs, and woody vines							
Japanese honeysuckle	*Lonicera japonica*		x	x			
Tree-of-heaven	*Ailanthus altissima*		x				
Japanese barberry	*Berberis thunbergii*	x	x	x			
Autumn olive	*Elaeagnus umbellata*	x	x	x			
Broadleaf, perennial herbs							
Mile-a-minute vine	*Polygonum perfoliatum*	x		x			x
English ivy	*Hedera helix*	x		x			

Purple loosestrife	*Lythrum salicaria*	x		x			x
Japanese knotweed	*Polygonum cuspidatum*	x	x	x	x		
Broadleaf, biennial herbs							
Chinese lespedeza	*Lespedeza cuneata*	x		x			
Sweet clovers	*Melilotus alba, M. officinalis*	x		x			
Canada thistle	*Cirsium arvense*	x		x			
Bull thistle	*Cirsium vulgare*	x		x			
Grasses							
Japanese stiltgrass	*Microstegium vimineum*	x					
Chinese silvergrass	*Miscanthus sinensis*	x					
Common reed grass	*Phragmites australis*	x				x	

2.2 Proposed Action

2.2.1 Integrated Pest Management and Basic Vegetation Management

2.2.1.1 Overview

Integrated pest management (IPM) refers to a combination of pest-control methods that provide more successful results than any one method alone. IPM is required under BLM policy for weed control, resulting in reduced costs, effective control, and reduced environmental impact. The proposed IPM methods include the following:

- herbicide application using triclopyr, glyphosate, imazapyr, and 2,4-D;
- manual techniques such as pulling, cutting, and mowing;
- prescribed fire for promoting native grassland communities and disposing of dead, woody debris; and
- biological control.

The BLM expects to treat a maximum of 150 acres per year. Treatments would apply the Standard Operating Procedures (SOPs) outlined in BLM's "Vegetation Treatments on Bureau of Land Management Lands in 17 Western States Programmatic Environmental Report," (PER) (BLM, 2007a) in Table 2-8, beginning on page 2-31. These SOPs include steps to be taken wherever applicable in order to minimize impacts to people, wildlife, water resources, non-target plants, and other resources. Since these SOPs pertain to activities on vast western public lands, SOPs pertaining to heavy equipment use, aerial spraying, arid environments, and fire suppression preparedness are not applicable and are therefore excluded from the context of this EA.

2.2.1.2 Herbicide Use

Herbicide treatments would follow BLM procedures outlined in BLM Handbook H-9011-1 (*Chemical Pest Control*), and Manuals 9011 (*Chemical Pest Control*) and 9015 (*Integrated Weed Management*).

The active ingredients that are proposed for use on the SRMA are **glyphosate**, **imazapyr**, **triclopyr**, and **2,4-D**:

- **Triclopyr** is an herbicide that is expected to be used solely for cut-stump and basal-bark treatment of woody plants. It is available in two formulations: an *amine* formulation and an *ester* formulation. The amine formulation is far less toxic to aquatic life than the ester formulation. Triclopyr is available in formulations that are approved for aquatic use.
- **Glyphosate** is a non-selective (toxic to all kinds of vascular plants), systemic (able to be translocated through plants by their vascular tissues) herbicide that can kill any green plant with which it comes into contact. Glyphosate is available in formulations that are approved for aquatic use. Glyphosate is expected to be used for foliar applications to a wide variety of herbaceous weeds and for cut-stump application to shrubs and trees. It is widely used because of its low cost, versatility, and ease of use.
- **Imazapyr** is a non-selective ingredient and is a member of a group of active ingredients known as acetolactate-synthase inhibitors. Imazapyr is available in formulations that are approved for aquatic use. This chemical's high potency may make it preferable to glyphosate.
- **2,4-D** is an herbicide that will not affect grasses and sedges if used according to label instructions. It is available in formulations that are approved for aquatic use and has been relatively inexpensive.

Herbicides will be applied to plants' leaves (foliar treatment), to the lower few inches of bark on some species of woody plants (basal bark treatment), or to a freshly-cut stump of a woody plant (cut-stump treatment). Applicators will include hand-held spray bottles, backpack sprayers, and power sprayers that are fed by trailer-mounted tanks.

2.2.1.3 Manual Control

Manual control refers to mowing, cutting, girdling, uprooting, or smothering plants to kill or suppress them or to facilitate the growth of other, nearby plants that would then suppress the controlled plant species. Manual control methods are often used in combination with herbicides. For example, Canada thistles may be effectively controlled by mowing and then treating the resprouting plants with an herbicide.

The BLM would expect to conduct manual control on a slightly larger scale than the herbicide treatments. Many uses of manual control – cutting plants – are used in tandem with later herbicide applications, and the BLM uses regular mowing to control Chinese lespedeza with or without herbicide use.

2.2.1.4 Prescribed Fire

Burning may be done in order to kill or suppress live plants or to remove dead plant parts to make an additional control method more successful. Prescribed fire is a reasonable tool to use for controlling patches of invasive plants that are so large that selective control using other methods is economically unfeasible. The primary situation in which the BLM expects prescribed fire to be an effective and efficient tool is in the control of non-native, cool-season grasses in areas where the BLM intends to establish meadows that are dominated by native, warm-season grasses. In this type of situation, prescribed fire may be used to prepare the site – by removing dead vegetation – or to suppress the

grass in order to make another control method more effective. This method also includes burning piles of brush to dispose of woody invasive plants. It is expected that no more than five prescribed fires of two acres or less will be used in a calendar year.

Prescribed fire would be used in accordance to BLM policies, the *Interagency Standards for Fire and Fire Aviation Operations*, and applicable state and municipal laws, regulations, and ordinances. The BLM will conduct site-specific preparation for prescribed burns in burn plans, which identify particular risks to property, human safety, non-target plants, and other resources and provide steps to be taken to minimize these risks, including safe weather conditions that must be verified before any fire is lit. Since the SRMA is in a populated area, the BLM will determine acceptable ranges for temperature, humidity, and wind speed and direction for each fire to minimize the possibility of the fire escaping and to prevent smoke from posing a risk to respiratory health of people in the vicinity or reducing visibility on local roads. This plan would be drafted by a specialist who has the appropriate qualifications for a prescribed burn boss (RXB2) and would be approved by the District Manager.

2.2.1.5 Biological Control

Biological control is the introduction or facilitation of one type of organism that will prey upon, parasitize, or otherwise suppress a pest species. The one biological control method proposed for the SRMA is the propagation of *Galerucella pusilla* and *G. calmariensis* beetles to control purple loosestrife (*Lythrum salicaria*). These beetles would be captured in nearby wetlands, bred and raised in captivity, and released into wetland areas that are infested with purple loosestrife.

2.3 No-Action Alternative

The no-action alternative is considered and analyzed to provide a baseline for comparison of the impacts of the proposed action. Known populations of invasive species, some of which are regulated by invasive species control laws and regulations, would be allowed to propagate at Meadowood.

3. Affected Environment

3.1. Introduction

This chapter presents the potentially affected existing environment (i.e., the physical, biological, social, and economic values and resources) of the SRMA. The SRMA consists of 804 acres (project area) located in Fairfax County, Virginia, approximately 2.5 miles southeast of downtown Lorton, Virginia and approximately 17.5 miles southwest of downtown Washington, DC, east of Interstate 95 on the Mason Neck Peninsula (Appendix A). The project area is in the Coastal Plain province, which is characterized by broad rolling hills and moderate slopes. The project area is in the Kane Creek watershed and drains east and west into two on-site streams that run south and converge into Thompson Creek, flowing eventually to Belmont Bay, the Potomac River, and Chesapeake Bay. This chapter provides the baseline for comparison of impacts/consequences described in Chapter 4.

3.2. Air Quality

Air quality data were obtained from the Virginia Department of Environmental Quality's (DEQ) website (2016). The BLM's primary contaminant of interest is particulate matter ($PM_{2.5}$), since prescribed fire would release particulate matter into the atmosphere, potentially causing or triggering health problems by people nearby or downwind of the site. The nearest DEQ air quality monitor that monitors $PM_{2.5}$ is in Lee District Park, ten miles north-northeast of the SRMA. At Lee District Park, the maximum $PM_{2.5}$ value in 2014 was 55.7 micrograms per cubic meter, and the average value was 7.8 $\mu g/m^3$. Neither of these values is considered unhealthy for sensitive groups.

The project area is within one mile of Interstate 95 and U.S. Highway 1. Gunston Elementary School is adjacent to the project area, and there are many residences within one mile of the project area. The freeways and other roads are potential risk factors for impaired visibility due to smoke, and the school and residential areas are potential risk factors for asthma and other respiratory ailments due to smoke.

3.3. Health and Safety

The proposed activities all incorporate some level of risk to workers. Risks to other people due to air quality impacts are considered in the **Air Quality** section, above. Risks to workers include acute and chronic health problems due to pesticide exposure, injuries from working with power and manual cutting tools, and injuries due to smoke inhalation and exposure to fire.

3.4. Fire and Fuels Management

Most of the forests in the project area are of types that historically experienced stand-replacing fires at extremely long intervals (>1,000 years). The forested portions of the project area are in fire regime condition class I or II, since there has been little change to the natural fire regime. The pastures have been carved out of these forests and most likely have no natural fire history since they were cleared for use as pastures.

3.5. Water Quality

Belmont Bay is listed as an impaired estuary with low levels of dissolved oxygen and elevated levels of PCBs. Causes of these impairments include, but are not limited to, atmospheric deposition of nitrogen and toxics, combined sewer overflows, contaminated sediments, industrial point discharge, and loss of riparian habitat. The tributaries that flow through the SRMA are not listed as impaired.

3.6. Fish and Wildlife

As detailed in **Vegetation**, below, the SRMA includes mature woodlands, meadows, pastures, and wetlands. A thorough inventory of Meadowood's birds (194 species), macroinvertebrates, fishes, lizards, amphibians, snakes, and mammals was conducted throughout the period from 1996 to 2014 and compiled about 400 total wildlife species. The project area is almost entirely wooded and includes similar habitats to those found within the current SRMA boundary, including a creek that drains to Thompson Creek.

3.6.1 Special-Status Species

No species listed under the Endangered Species Act are known to occur within the current SRMA boundary or the project area. The BLM conducted a query on November 12, 2015 (Appendix B), using the U.S. Fish and Wildlife Service's Information for Planning and Conservation Tool (IPaC)(U.S. Fish and Wildlife Service, 2015), an online resource for determining whether Endangered Species Act-listed species may be present within a project area. The search determined that northern long-eared bat (*Myotis septentrionalis*) may be present within the project area. Northern long-eared bats roost under loose or exfoliating tree bark or other natural or man-made crevasses, and they forage at night in wooded areas. They hibernate in caves and other underground structures with steady, cool temperatures, high humidity, and minimal air movement. The northern long-eared bat's primary threat is white-nose syndrome, an aggressive fungal disease that has resulted in the mortality of up to 99% of bats in hibernacula throughout the eastern United States. Other, lesser threats to this species include the destruction of roosting trees and wooded habitat used for foraging for insects or swarming prior to hibernation.

3.7. Vegetation

The SRMA contains a mosaic of upland forest primarily composed of American Beech (*Fagus grandifolia*), open wetlands, pastures consisting of imported forage species, and meadows in some stage of conversion to prairie habitat (Virginia Department of Conservation and Recreation, 2013). The Audubon Society of Northern Virginia has compiled an inexhaustive list of plant species observed on the property (The Audubon Society of Northern Virginia, 2014).

3.7.1 Invasive Species/Noxious Weeds

Noxious and invasive plant species in Fairfax County include, but are not limited to, Japanese honeysuckle (*Lonicera japonica*), Japanese stiltgrass (*Microstegium vimineum)*, tree of heaven (*Ailanthus altissima*), porcelain berry (*Ampelopsis brevipedunculata*), garlic mustard (*Alliaria petiolata*), mimosa or silktree (*Albizia julibrissin)*, mile-a-minute weed (devil's tail) (*Persicaria perfoliata)*, and Norway maple (*Acer platanoides)* (Fairfax County, Virginia, 2005; Virginia Department of Conservation and Recreation,

2015a). Purple loosestrife (*Lythrum salicaria*) and European wand loosestrife (*Lythrum virgatum*) are Virginia state-listed noxious weeds that may potentially be present in Fairfax County (Natural Resources Conservation Service, 2015a). Likely target species, most of which are known to be present within or near the SRMA, are listed in Table 1 on page 7.

3.7.2 Special-Status Species

Previous endangered species consultations for projects at Meadowood have indicated that the small whorled pogonia, a threatened species that lives in mature hardwood stands with open understory, may be present near the SRMA, but this species has not be found within the SRMA.

3.8. Cultural Resources

A cultural resource is a location of human activity, occupation, or use identifiable through field inventory, historical documentation, or oral evidence. Cultural resources include both historic and prehistoric archaeological sites, structures, places of architectural significance, and locations with important public and scientific uses and may include traditional cultural properties, which are definite locations of traditional and or cultural importance to specific social and or cultural groups. Cultural resources include but are not limited to the following types: prehistoric archaeological resource, ethnographic resource, and historic-period archaeological and built environment resources. Cultural resources may be eligible for the National Register of Historic Places (NRHP).

3.8.1 Cultural Context

3.8.1.1 Paleoindian-8000BCE to Earlier

Modern day Virginia first became inhabited by humans sometime before 10,000 BCE, and the earliest identifiable artifacts from this time include Clovis projectile points. The points later became smaller while continuing to have Clovis indicators. The inhabitants of the region are believed to have been foragers focused on hunting, with small bands exploiting defined swathes of territory (Gardner, 1989; Turner, 1989; Levinthal and Frost, 2007).

3.8.1.2 Archaic 8000-1200 BCE

The beginning of the Archaic period came at the end of the Pleistocene epoch, and saw a climatic change from boreal forests to mixed conifer-deciduous forests. Eastern Virginia shifted to a temperate climate and the Chesapeake estuary began to form around this time (Dent, 1995). Band level organizations moved to exploit seasonal resources and more specialized craft production became common; this is believed to have reflected an increase in population. New tools for food procurement such as ground stones, atlatls, and axes, among others, became more common. The Archaic also saw the development of corner and side notched projectile points, with a shift to stemmed points as time progressed. Increases in population density and decreased mobility occurred throughout the Middle Atlantic more permanent settlements being formed around waterways.

3.8.1.3 Woodland Era (1200 BCE-1600 CE)

The Woodland period saw an increased dependence on horticulture and increased sedentism, as well as the appearance of ceramics. Early Woodland sites often consist of small camps on rivers and smaller

streams, a shift in settlement began during the late Archaic Era. By the Middle Woodland period into the Late Woodland era, intensive farming of river areas had morphed into a reliance on agriculture. Diagnostic artifacts from this period include triangular projectile points, and ceramics tempered with sand, stone, and shell in coastal regions. Villages tended to be inhabited for longer periods of time and some became fortified by wooden palisades. By the Late Woodland period, base camp habitation sites had been supplanted by larger, permanent village sites. Such locations are typically found on bluffs, terraces, or floodplains near rivers or major tributaries, but would still be serviced by smaller, seasonal, satellite camps, often characterized by sparse lithic and ceramic scatters (Turner, 1992).

3.8.1.4 Historic Era (1600-Present)

The Historic Era in modern Fairfax County began in the late 1500s with Spanish exploration of the area. English settlement during the late 1500s and early 1600s focused on areas to the south around Jamestown, and in 1607 Captain John Smith explored the area, although it is unknown if he visited Mason Neck itself. English settlement gradually moved north and by the 1640s most of Mason Neck had been claimed by planters. The project area is within land patented by either John Gosnell in 1651 or John Drayton in 1654 (Moxham, 1975). Continued settlement throughout the 1600s led to conflict with Native inhabitants. Additionally, new land grants issued by King Charles II forced many of the original European settlers off of their lands (Levinthal, et. al. 2007).

Settlement continued into the 1700s, and by 1741 the Virginia Assembly created Fairfax County. George Mason, plantation owner and writer of Virginia's Declaration of Rights, which influenced both the Declaration of Independence and U.S. Constitution, acquired several parcels of land on Mason Neck in the 1750s and moved into his home at Gunston Hall by 1759. It is unknown if Mason owned any part of the Meadowood property (Moxham, 1975).

As with much of the region, Fairfax County and Mason Neck relied on tobacco farming as the primary industry. By the time of the American Revolution almost all of the arable land in Fairfax County had been planted with tobacco at some point, causing soil depletion and the diversification of crops, especially grains, by the 19th century (Kulikoff, 1986). This also caused the subdivision of several large plantations during the late 18th-early 19th century, creating smaller, modest homesteads, and reducing the overall amount of slave ownership.

During the Civil War, Fairfax County experienced no battles but saw significant military activity with both Union and Confederate troops occupying different parts of the region. Maps from the war indicate the presence of Confederate picket lines at several locations throughout Mason Neck, although Union troops also occupied portions of the region at different times during the conflict (Inashima, 2011).

The war economically ruined Fairfax County although it had recovered substantially by the 1870s; however, Mason Neck remained rural in nature. This has continued into the modern era; while Fairfax County has grown in population and, because of its location next to Washington, DC, in government and international industry, Mason Neck has continued to be rural with little development outside of housing developments.

3.8.1.5 History of Meadowood Farm

Several historic roads as seen in maps from the 1700s and 1800s traversed the Meadowood area, many of which are still extant but unused. The BLM has placed interpretive signs at some of these roads. One road of note is the Colchester-Gunston Road; used between 1748 and 1869, it was initially discovered by surveys in 2003 and is believed to have been used by General Rochambeau and his troops while en-route to the Siege of Yorktown in 1781 (Ferone, 2003b). Additionally, a campsite used by General Rochambeau is also located on BLM property. Much of the SRMA has been used for agricultural purposes or open pasture since at least 1937, based on historic aerial photos (Fairfax County 1937, 1953, 1997). More recently, Edwin Lynch acquired the property in 1976 and named it Meadowood Farm. That same year he removed several acres of forest to construct the barn and the rest of the buildings in the current administrative area. The BLM acquired the property in a land exchange in 2001 (Francis, 2010).

3.8.1.6 Cultural Resources at Meadowood SRMA

The Meadowood SRMA has been subjected to at least seven archeological surveys resulting in the creation of six completed reports between 2000 and 2015. These involved various locations throughout the project, but more specifically a series of surveys completed in 2004 and 2005 resulted in the recording of approximately 160 archeological sites within or immediately adjacent to the boundaries of the SRMA. Of these sites, over 80% are purely pre-historic in origin (originating prior to 1606 per Virginia Department of Historic Resources guidelines), the rest consisting of historic and prehistoric components. The prehistoric sites consist mostly of camps and quarries, with the cultural remains consisting almost exclusively of stone tool manufacturing byproducts (commonly referred to as debitage, while the historic elements are primarily refuse scatters and deposits.

3.9. Recreation

The main purpose of the SRMA is to provide and maintain an area for various forms of public recreation and environmental education/interpretation while managing and protecting its natural and cultural resources. The SRMA has a multiple-use trail system that includes seven miles of equestrian trails, 6.8 miles of mountain bike trails, 13.4 miles of hiking trails, and an outdoor riding arena.

4. Environmental Impacts

4.1. Introduction

This section describes the expected direct, indirect and cumulative impacts to the resources that are described in Chapter 3.

4.2. Air Quality

The potential for the proposed action to impact air quality stems from the use of prescribed fire. Prescribed fire may emit particulate matter ($PM_{2.5}$). These emissions are expected to be well within *de minimis* amounts and are not expected to have a measurable impact on air quality within Mason Neck Peninsula. The BLM will address in detail the potential for smoke and other particulate matter to reach

people who may be sensitive to them, and the smoke management plan, which will be part of any prescribed burn plan, will include acceptable weather conditions for minimizing smoke exposure and steps to be taken to warn trail users, other visitors, and neighbors of expected smoke before a burn.

Smoke may reduce visibility, which could pose a hazard to drivers on local roads. The BLM will minimize the risk of dangerous reductions in visibility by using prescribed burn plans and lighting fires only when the weather conditions are within the acceptable range prescribed therein.

4.3. Health and Safety

Health issues that may be caused by ambient smoke from prescribed fire are addressed in the **Air Quality** section. The BLM uses risk analyses to identify and mitigate the potential dangers inherent in various land management tasks.

The primary health and safety issue from herbicide application is worker exposure due to accidental spills or improper use of protective clothing. Spills may result in acute illness in the case of an accidental, high dose, and repeated, low doses, caused by failure to wear protective gloves or other clothing, may result in chronic illness such as cancer. The BLM's required pesticide applicator certification program includes thorough, instructor-led training that applicators must repeat every three years. The training covers, among other topics, proper pesticide handling, mixing, and storage procedures and personal protective equipment use for minimizing exposure to pesticides.

Manual methods for controlling invasive species involve the use of cutting tools, both hand-operated and power-driven. Chainsaw users are required to complete the BLM's basic feller training.

While prescribed fire may produce ambient levels of particulate matter that may trigger health problems in people who are downwind of a prescribe burn, the elevated smoke levels present at the burn site may cause burning and other respiratory symptoms in workers. Likewise, workers are susceptible to being burned by direct contact with fire or burning embers carried by wind. The BLM requires all workers participating on a prescribed burn to have basic firefighter qualifications, and a burn boss holding appropriate qualifications would develop a thorough burn plan and be on site for the duration of the fire. In order to maintain these qualifications, firefighters must annually pass a physical fitness test and take a refresher training course that covers safety procedures.

Through these protocols and certification requirements, the BLM expects its invasive species control activities to result in no incidents to occur that would result in employee lost time.

4.4. Fire and Fuels Management

The proposed action will not change the fire regime condition class of either the forests or the pastures, since prescribed fire will not fundamentally modify the vegetation composition. Forested areas will remain forested, and prescribed fire will most likely not be used to burn large areas of forested ground. The effect of fire in the pastures may be an increase in a site's flammability, since fire would likely be used to promote warm-season grasses, which grow taller and provide more fuel than the dominant pasture species.

4.5. Water Quality

The risk posed to water quality by the proposed action is the potential contamination of surface water or groundwater by pesticides that run off or are blown by wind into surface water, leach into groundwater, or are accidentally spilled into a river or lake. Herbicide application using backpack sprayers or spray bottles poses almost no possibility that enough herbicide could be spilled to produce a measurable contamination of a flowing stream, the Potomac River, or one of its bays. This is likely true also for application that is done with one of the trailer-mounted tank sprayers. The BLM will further reduce the likelihood of a spill to a waterway, when using the trailer-mounted tank sprayer, by parking the tank at least 100 feet from any waterway and conducting all tank mixing on a paved pad. The BLM takes further precaution to minimize spray drift by applying herbicides only when wind speeds are low enough to prevent pesticides from drifting onto non-target plants. This precaution further minimizes the potential for pesticides to reach streams or other surface waters.

4.6. Fish and Wildlife

Two types of potential impacts to fish, other aquatic species, and wildlife are analyzed: direct impacts to individuals caused by the methods being used to control invasive species and indirect impacts to populations caused by changes to the habitat that result from controlling invasive species.

Direct harm to individual fish, other aquatic species, or wild animals may result from these animals coming into contact with herbicides. This could happen when animals are inadvertently sprayed or when they come into contact with contaminated plants, animals, soil, or water. There is a great deal of uncertainty in estimating the toxicity and effects of herbicides on wild animals for several reasons:

- The diversity of animal taxa makes it unrealistic for scientists to study a broad cross-section of the animals that may be exposed to herbicides.
- Herbicide toxicity is possible at amounts, in ways, and over time periods that scientists have not yet tested.
- Herbicides degrade in the environment and turn into chemical compounds that have not yet been tested for toxicity.
- Herbicide formulations contain adjuvants, added chemicals that are designed to enhance the effectiveness of the herbicide active ingredients. These adjuvants may themselves be toxic, and they may change the toxic effects of the active ingredients.

Likewise, available herbicide toxicity studies, coupled with models that estimate how much an animal might be exposed to an herbicide under different treatment scenarios, estimate that fish, aquatic animals, insects, and mammals are not likely to be harmed by herbicide application under the Proposed action. These conclusions take into account the small amounts of herbicide to be applied, the application methods, and the observed and estimated toxicity of the ingredients being applied.

Apart from the minimal exposure that the proposed action presents to animals, the indirect effect expected from the proposed action is increased habitat diversity, which will enable a broader diversity of animals to use the SRMA for shelter, foraging, hunting, and other key functions of wildlife habitat.

4.6.1 Special-Status Species

The proposed action is expected to have no effect or strictly beneficial effects on endangered wildlife species. Removal of small numbers of small trees in suitable foraging habitat for northern long-eared bats will not affect the ability of individuals to find insect prey. The BLM will survey potential roost trees before removing them to determine whether they are being used by northern long-eared bats. If bats are using trees that must be removed, then the BLM will remove them during the season of hibernation, when bats are not present.

If and when other species are listed under the Endangered Species Act or identified on or near the project area, the BLM will incorporate habitat surveys into its vegetation management plans to ensure that endangered species are not harmed.

While the no-action alternative would not result in direct impacts to endangered species and other wildlife, it would lead to the long-term degradation of the various habitats for endangered species that are present throughout the project area.

4.7. Vegetation

4.7.1 Invasive Species/Noxious Weeds

Expected effects to invasive species range from localized, temporary control to long-lasting eradication, depending on the density of the infestation and the intensity and suitability of the control measures. The most important time to control any non-native, invasive species is when it has first been discovered in a habitat and is present in small numbers. This is because at the initial phase of an infestation, the species can be eradicated with a relatively minimal effort and has not yet had a chance to affect a large area. Such early detection and rapid response is difficult, though, since it requires regular surveillance of the entire project area, focusing most intensively on areas most likely to be vectors for seeds and other plant parts, such as roadways, waterways, and high-intensity use areas like pastures and recreational trails.

Chemical treatments, if conducted properly, are highly effective at killing or suppressing the target species. If seeds of the target species are present, or if the target species are continually being brought into a control site by animals, vehicles, or other vectors, then treatments must be repeated or combined with other methods to ensure long-term success. This is why the BLM – and most land-management agencies and professionals – use integrated pest management, which combines various control methods instead of depending solely on chemical treatments to achieve the desired results.

Manual treatments have a range of effects on invasive species. Manually removing woody species by cutting is highly effective at removing individuals. If seeds are present in the soil, then the removal of a portion of the canopy tends to stimulate resurgence of the species, and repeated treatment is

necessary. The same is true of mowing: this type of treatment is effective at preventing seed production in the current season, but it is usually not sufficient as a stand-alone control method.

Prescribed fire is a cost-effective way to treat a large area, but it usually needs to be repeated or combined with another type of treatment. Unlike chemical or manual treatments, prescribed fire may promote some warm-season grasses and forbs through heat-induced germination or by blackening the soil in spring, which causes it to warm up sooner and stimulates growth of warm-season species.

Biological control is the one control measure that has the potential to propagate itself long after the initial release. This brings the potential for long-term control of a species without repeating the treatment. In most cases, biological control is not intended to eradicate a target species, since total eradication would lead to the death of the biological control agent.

The no-action alternative would preclude all of these impacts to invasive species and would allow them to proliferate throughout the project area and beyond into other lands throughout the Mason Neck Peninsula.

4.7.2 Special-Status Species

The small whorled pogonia is not known to occur in the decision area and will not be directly impacted by the proposed action. The indirect impact of the proposed action will be improved habitat conditions for this species, which could foreseeably be established on the SRMA as part of its recovery. The no-action alternative would lead to a reduction in the area of suitable habitat for the small whorled pogonia and other sensitive species.

4.8. Cultural Resources

4.8.1 Alternative 1 – Integrated Pest Management

Activities associated with the proposed action may directly or indirectly affect both known cultural resources and those not previously identified prior to project implementation. Due to the nature of cultural resources it is difficult to state what level of impacts can be expected at any site within a proposed treatment; additionally, each site possesses unique characteristics that may make it eligible for the NRHP. Sites must be evaluated against NRHP criteria to determine eligibility and what effects they could face from project activities. The Virginia Department of Historic Resources (VADHR) will be consulted prior to any vegetation treatment project which has the potential to harm cultural resources.

4.8.2 Prescribed Fire

Uncontrolled wildfire has a high potential to damage surface and subsurface archeological deposits because it has the potential to burn at a high intensity. Prescribed fire generally has a lower intensity burn, minimizing negative effects to cultural remains. The preferred method of protecting archeological sites during and through prescribed fire will be determined in consultation with the archeologist, botanist, and fire staff. If the vegetation is light enough or of a type that would not create a high intensity burn, a fire through the site may be permissible. If the fuel load is of a type or amount which would cause a high intensity burn, pretreatment through manual vegetation removal as described in the

below section will be completed prior to any burning. All cut vegetation will be moved to a location not located within an archeological site for disposal or burning.

Fire will not be used within or immediately adjacent to any archeological site determined by the BLM and or VADHR to be significant enough to warrant full protection. While construction of firelines (removal of vegetation to mineral soil) is often seen as a preferred method for protecting such sites, they will not be permitted because of the density of archeological sites at Meadowood and the increased possibility of damage to subsurface archeological deposits. Alternative methods of protecting such sites will include wetlines (use of water to wet vegetation around the site) and black lines (burning of vegetation around the site).

Archeological monitoring would take place during pretreatment and burning in case either activity uncovers archeological remains. An archeologist will flag all archeological sites prior to treatment to indicate to work crews which areas will need to be pretreated. All burned areas will be surveyed to determine if any archeological materials have been uncovered.

4.8.3 Vegetation Removal-Mechanical

Mechanical removal of vegetation by heavy equipment or other vehicles can have a severe effect on cultural resources. Bulldozers, backhoes, Bobcat style tractors, and cross-country travel by heavy vehicles would cause the most damage to archeological remains because of the high potential to disturb archeological deposits. Areas most likely to be damaged by such equipment include turnaround locations, laydown areas, and construction of new access routes. Dragging or "skidding" routes for timber removal. These activities can not only disturb the context of the archeological sites but also expose artifacts to the elements and make them more visible to potential looting and can also increase the chance of erosion.

Mechanical vegetation removal will be avoided within archeological sites. When possible, vehicles should use current, designated routes to access archeological sites. In consultation with an archeologist, driving across archeological sites with smaller, tracked vehicles and trucks when the ground is frozen may be permitted, although dragging of logs will still be prohibited. Archeological monitoring will be conducted during any mechanical vegetation removal conducted in or adjacent to archeological sites. Removal of stumps will be avoided with archeological sites.

4.8.4 Vegetation Removal-Manual

Manual removal of vegetation includes the cutting of vegetation using chainsaws, saws, and clippers. This is the preferred method of vegetation removal within archeological sites because it is the least damaging to archeological deposits. All cut vegetation would be removed to a location not located on an archeological site either through carrying or non-motorized transport (such as wheelbarrows) to prevent excess ground disturbance. This would not only prevent the undue exposure of archeological artifacts but reduce indirect effects through erosion.

4.8.5 Biological Control Methods

Implementation of this method would not affect cultural resources.

4.8.6 No-Action Alternative

There would be no direct effects to archeological sites because no new management actions would be implemented. However, by not reducing fuel loads and allowing noxious species to proliferate, sites would be more susceptible to damage from an uncontrolled wildfire. Wildfires generally burn at a higher intensity than prescribed fires and are more likely damage surface and shallow, subsurface cultural remains.

4.9 Recreation

4.9.1 Integrated Pest Management Alternatives

The proposed action will temporarily hamper some recreational activities by rendering some areas either off-limits, such as areas that are being burned, or undesirable for recreational use, such as areas that have recently been burned and have messy ashes scattered on the ground. If stumps have been removed, then holes may pose a tripping hazard to hikers and horses. The BLM would mitigate this possibility by marking holes with brightly-colored barriers until they can be filled in with earth.

The proposed action is expected to enhance, after these initial effects have passed, the SRMA's desirability for nature-based recreation by increasing plant diversity and improving habitat for native wildlife.

4.9.2 No-Action Alternative

The no-action alternative would allow non-native, invasive species to continue to proliferate, causing some scenic views and watchable wildlife areas to become degraded by dense vegetation growth. Decreased vegetative diversity throughout the project area would reduce the quality of various nature-based recreational activities, such as hiking, bird-watching, and nature photography.

4.10 Cumulative Impacts

CEQ regulations direct proponents to consider the potential environmental impacts resulting from "the incremental impacts of the action when added to past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions" (40 CFR 1508.7). Recent CEQ guidance in considering cumulative effects involves defining the scope of the other actions and their interrelationship with the proposed action. The scope must consider geographical and temporal overlaps among the proposed actions and other actions. It must also evaluate the nature of interactions among these actions.

Cumulative effects are most likely to arise when a relationship or synergism exists between the proposed action and other actions expected to occur in a similar location or during a similar time period. Actions overlapping with or in proximity to the proposed action would be expected to have more potential for a relationship than those more geographically separated.

To identify cumulative effects, three fundamental questions need to be addressed:

- Does a relationship exist such that affected resource areas of the proposed action might interact with the affected resource areas of past, present, or reasonably foreseeable actions?
- If one or more of the affected resource areas of the proposed action and another action could be expected to interact, would the proposed action affect or be affected by impacts of the other action?
- If such a relationship exists, then does an assessment reveal any potentially significant impacts not identified when the proposed action is considered alone?

The scope of the cumulative effects analysis involves both the geographic extent of the effects and the time frame in which the effects could be expected to occur. For this EA, the affected area includes the boundary of the SRMA and surrounding vicinity.

The proposed action is expected, overall, to have beneficial cumulative impacts to the SRMA as the vegetation management activities take place for a short duration and provide for a healthier and more diverse ecosystem over time.

Cumulatively, the no-action alternative would adversely impact invasive species by allowing them to proliferate throughout the project area and beyond into other lands throughout the Mason Neck Peninsula, and subsequent degradation of the natural environment, plant and animal habitats, and recreational opportunities at the SRMA.

5.0 Persons, Groups, and Agencies Consulted

5.1 Agencies Consulted

U.S. Fish and Wildlife Service
Virginia Department of Historic Resources

5.2 List of Preparers

List of Preparers

Name	Title	Responsible for the Following Section(s) of this Document
Derek Strohl, Bureau of Land Management	Natural Resource Specialist	Primary preparer
Jarrod X Kellogg, Bureau of Land Management	Archeologist	Cultural Resources
Kurt Wadzinski, Bureau of Land Management	Planning and Environmental Coordinator	Editor
Zachary Reichold	Manager, Lower Potomac Field Station	Reviewer
Timothy Hough	Outdoor Recreation Planner	Reviewer
Jonathan Beck	Recreation Technician	Reviewer

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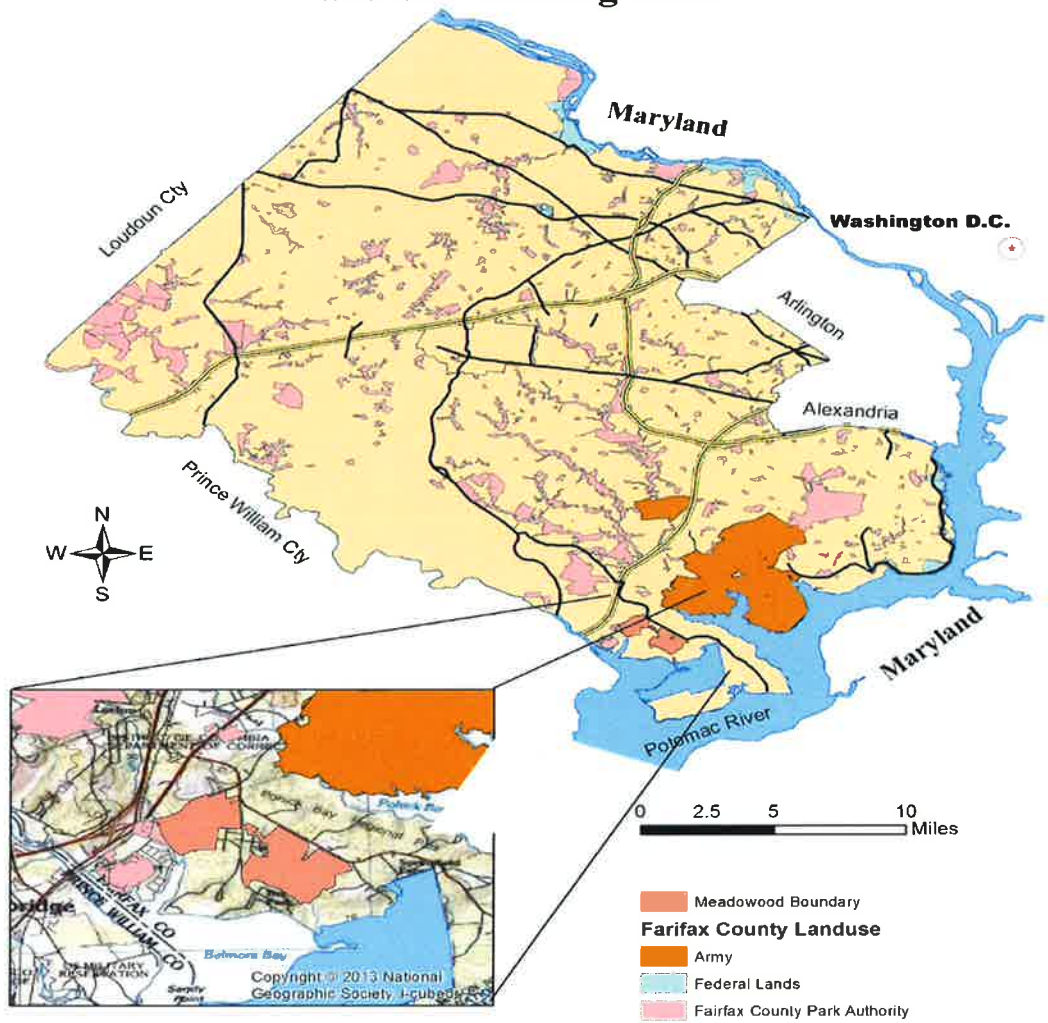
7.0 Appendices

7.1 Appendix A: Map of Meadowood SRMA

General Location Map
Meadowood Special Recreation Management Area
and Surrounding Areas



No warrantee is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of the data layers shown on this map. The official land records of the data providers should be checked for current status on any specific tract of land.

7.2 Appendix B: iPaC Trust Resources Report for Meadowood Vegetation Management EA

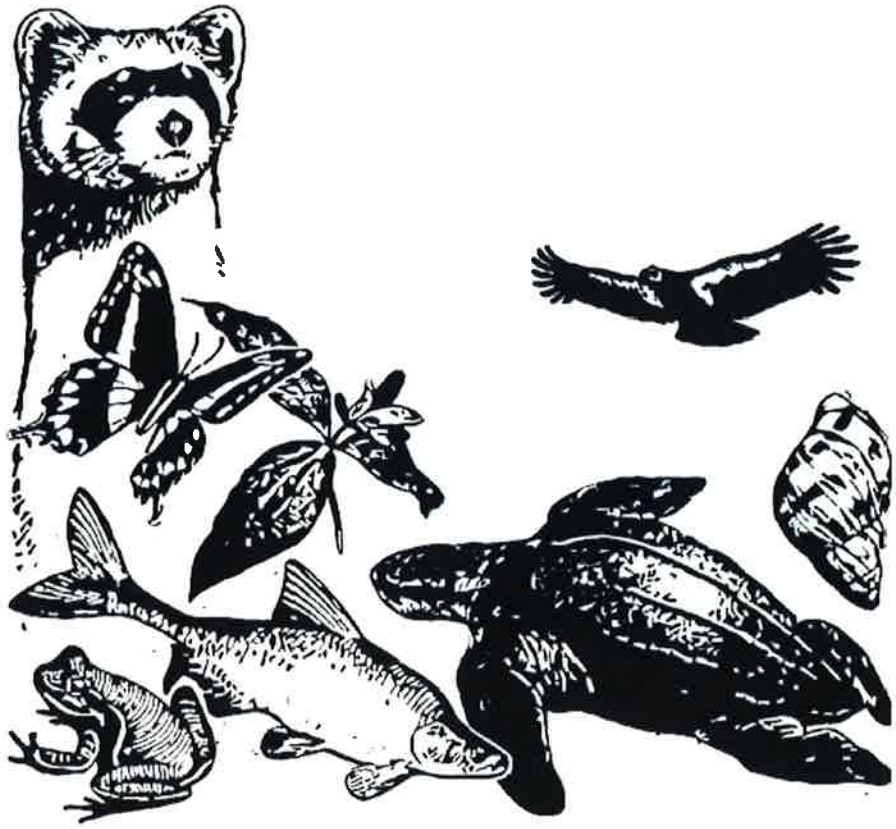
U.S. Fish & Wildlife Service

Meadowood Vegetation Management EA

IPaC Trust Resource Report

Generated November 12, 2015 07:33 AM MST

This report is for informational purposes only and should not be used for planning or analyzing project-level impacts. For projects that require FWS review, please return to this project on the IPaC website and request an official species list from the Regulatory Documents page.



US Fish & Wildlife Service

IPaC Trust Resource Report

Project Description

NAME

Meadowood Vegetation Management EA

PROJECT CODE

PJYCF-T5JKF-EWJI4-4CTVD-3J3Y5Q

LOCATION

Fairfax County, Virginia

DESCRIPTION

Vegetation management, including invasive species control using chemical, manual, and biological treatments and prescribed fire. Project area is approximately 1 square mile near the Potomac River in Virginia and includes forests, ravines, wetlands, and fields in various states of degradation.

U.S. Fish & Wildlife Contact Information

Species in this report are managed by:

Virginia Ecological Services Field Office
6669 Short Lane
Gloucester, VA 23061-4410
(804) 693-6694

Endangered Species

Proposed, candidate, threatened, and endangered species that are managed by the Endangered Species Program and should be considered as part of an effect analysis for this project.

This unofficial species list is for informational purposes only and does not fulfill the requirements under Section 7 of the Endangered Species Act, which states that Federal agencies are required to "request of the Secretary of Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action." This requirement applies to projects which are conducted, permitted or licensed by any Federal agency.

A letter from the local office and a species list which fulfills this requirement can be obtained by returning to this project on the IPaC website and requesting an official species list on the Regulatory Documents page.

Mammals

Northern Long-eared Bat Myotis septentrionalis — Threatened

CRITICAL HABITAT
No critical habitat has been designated for this species.

https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=A0JE

Critical Habitats

Potential effects to critical habitat(s) within the project area must be analyzed along with the endangered species themselves.

There is no critical habitat within this project area

Migratory Birds

Birds are protected by the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act.

Any activity which results in the take of migratory birds or eagles is prohibited unless authorized by the U.S. Fish and Wildlife Service (1). There are no provisions for allowing the take of migratory birds that are unintentionally killed or injured.

You are responsible for complying with the appropriate regulations for the protection of birds as part of this project. This involves analyzing potential impacts and implementing appropriate conservation measures for all project activities.

American Oystercatcher Haematopus palliatus — Bird of conservation concern
Year-round
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0G8

American Bittern Botaurus lentiginosus — Bird of conservation concern
Season: Wintering
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0F3

Bald Eagle Haliaeetus leucocephalus — Bird of conservation concern
Year-round
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B008

Black-billed Cuckoo Coccyzus erythropthalmus — Bird of conservation concern
Season: Breeding
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0HI

Blue-winged Warbler Vermivora pinus — Bird of conservation concern
Season: Breeding

Fox Sparrow Passerella iliaca — Bird of conservation concern
Season: Wintering

Gull-billed Tern Gelochelidon nilotica — Bird of conservation concern
Season: Breeding
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0JV

Kentucky Warbler Oporornis formosus — Bird of conservation concern
Season: Breeding

Least Bittern Ixobrychus exilis — Bird of conservation concern
Season: Breeding

Pied-billed Grebe Podilymbus podiceps — Bird of conservation concern
Season: Breeding

Prairie Warbler Dendroica discolor — Bird of conservation concern
Season: Breeding

Prothonotary Warbler Protonotaria citrea — Bird of conservation concern
Season: Breeding

Purple Sandpiper Calidris maritima — Bird of conservation concern
Season: Wintering

Red-headed Woodpecker Melanerpes erythrocephalus — Bird of conservation concern
Year-round

Rusty Blackbird Euphagus carolinus — Bird of conservation concern
Season: Wintering

Short-billed Dowitcher Limnodromus griseus — Bird of conservation concern
Season: Wintering

Short-eared Owl Asio flammeus — Bird of conservation concern
Season: Wintering
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0HD

Snowy Egret Egretta thula — Bird of conservation concern
Season: Breeding

Wood Thrush Hylocichla mustelina — Bird of conservation concern
Season: Breeding

Worm Eating Warbler Helmitheros vermivorum — Bird of conservation concern
Season: Breeding

Refuges

Any activity proposed on National Wildlife Refuge lands must undergo a 'Compatibility Determination' conducted by the Refuge. If your project overlaps or otherwise impacts a Refuge, please contact that Refuge to discuss the authorization process.

There are no refuges within this project area

Wetlands

Impacts to NWI wetlands and other aquatic habitats from your project may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal Statutes.

Project proponents should discuss the relationship of these requirements to their project with the Regulatory Program of the appropriate U.S. Army Corps of Engineers District.

DATA LIMITATIONS

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

DATA EXCLUSIONS

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

DATA PRECAUTIONS

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

Wetland data is unavailable at this time.