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Bureau of Land Management
Eastern States
Lower Potomac Field Station
LLESM03400

Supplemental Environmental Assessment

NEPA #: DOI-BLM-ES-0920-2015-0011-EA

Barn Improvements Meadowood Special Recreation Management Area

Date: July 2015

Type of Action: Environmental Assessment

Location: Meadowood Special Recreation Management Area (SRMA)
10406 Gunston Road
Lorton, Virginia 22079

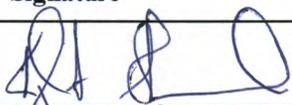
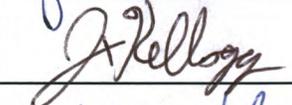
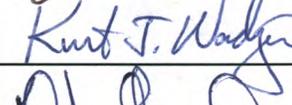
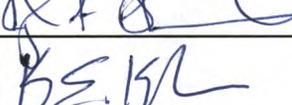
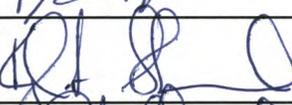
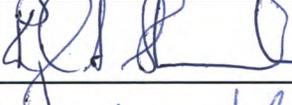
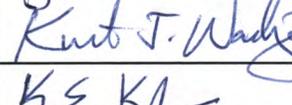
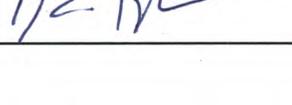
Project Acreage: 12 acres

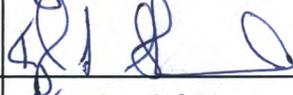
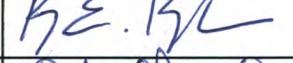
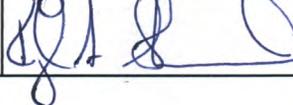
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MISSION STATEMENT

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Technical Review

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ACRONYMS

ABA - Architectural Barriers Act

ADA - Americans with Disability Act

APE - Area of Potential Effects

ARPA - Archaeological Resources Protection Act

BLM - Bureau of Land Management

CAA - Clean Air Act

CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act

CWA - Clean Water Act

DOI - Department of the Interior

DPWES - Department of Public Works and Environmental Services

DRO - Diesel Range Organics

EA - Environmental Assessment

ESO - Eastern States Office

ESA - Endangered Species Act

FLPMA - Federal Land Policy and Management Act

FONSI - Finding of No Significant Impact

IAMP - Integrated Activity Management Plan

NEPA - National Environmental Policy Act

NHPA - National Historic Preservation Act

NOC - National Operations Center

NSD - Northeastern States District

RCRA - Resource Conservation and Recovery Act

SEA - Supplemental Environmental Assessment

SRMA - Special Recreation Management Area

USFWS - U.S. Fish and Wildlife Service

VADHR - Virginia Department of Historic Resources

VDCR - Virginia Department of Conservation and Recreation

VDGIF - Virginia Department of Game and Inland Fisheries

1.0 PURPOSE OF AND NEED FOR THE PROPOSED ACTION

1.1 INTRODUCTION

The Bureau of Land Management (BLM) is preparing this Supplemental Environmental Assessment (SEA) to address minor improvements in and around the existing barn at the Meadowood Special Recreation Management Area (SRMA) in Lorton, Virginia. In April 2014, BLM completed the *Environmental Assessment for Barn Deferred Maintenance at Meadowood SRMA* (EA), Finding of No Significant Impact (FONSI) and Decision Record for several proposed renovations to the existing barn to bring it into conformance with structural, plumbing, electrical, and Architectural Barriers Act (ABA) standards for Federal facilities (BLM, 2014). Since that time, additional proposed improvements have been identified including temporary equestrian shelters and feeding areas onsite to accommodate horses and user groups while the barn repairs occur; minor grading near the barn and indoor and outdoor riding arenas; and installation of temporary lighting at the outdoor arena.

This SEA provides a focused analysis of the potential impacts associated with these proposed improvements and serves as the basis for deciding whether the implementation of the Proposed Action would result in a significant impact on the environment, requiring the preparation of an Environmental Impact Statement, or that no significant impacts would occur and, therefore, a FONSI would be appropriate. The Proposed Action is described in greater detail in Chapter 2, Section 2.1.

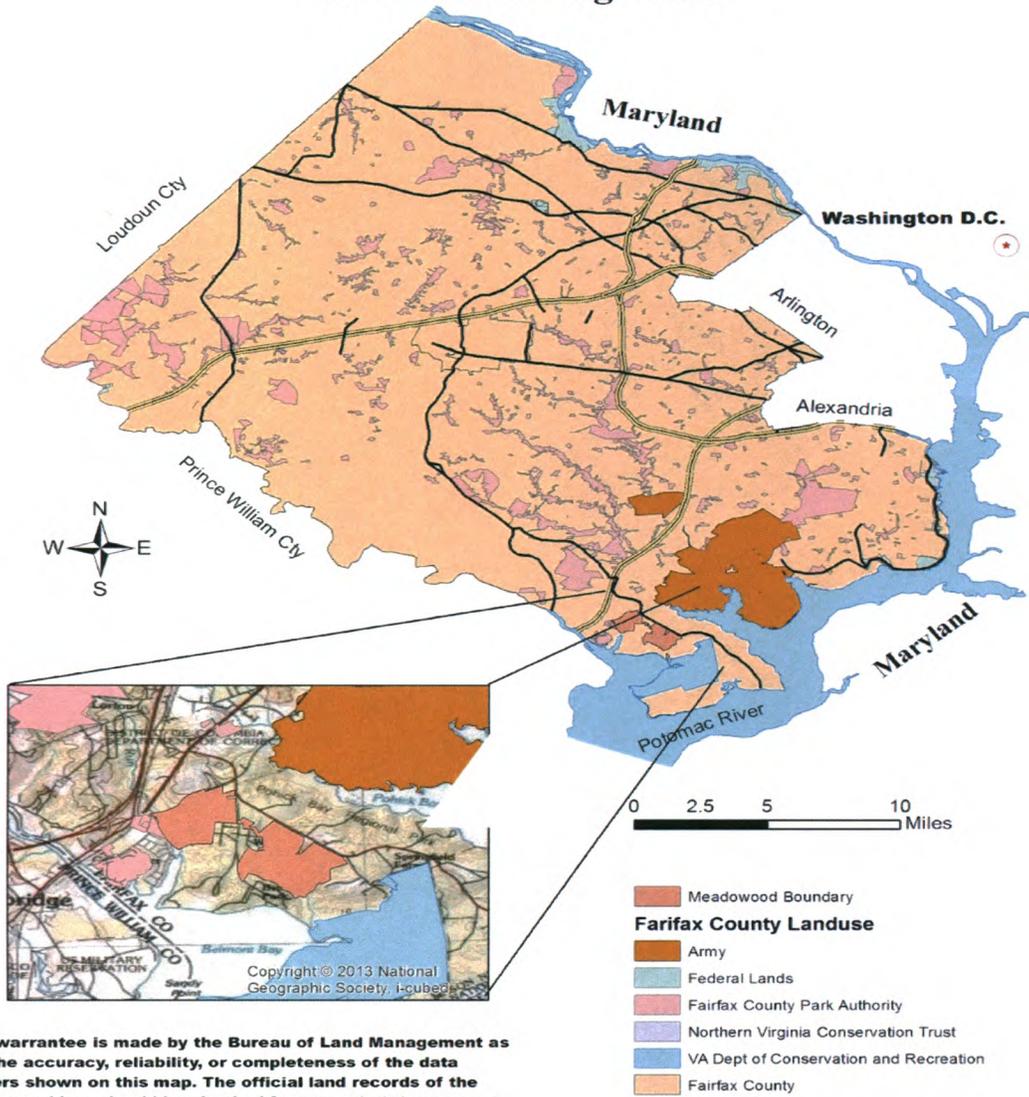
1.2 PROJECT LOCATION

Meadowood SRMA is 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 (Figure 1-1). The Meadowood SRMA is managed for natural and cultural resources, and offers a variety of recreational opportunities including trails for hiking, mountain biking, and horseback riding, fishing ponds, a control-line airplane flying area, environmental education programs, picnicking, geocaching, and bird watching. The existing barn is presently used by a concessionaire (CAS) who manages private horse boarders, and a non-profit operated therapeutic riding center (Simple Changes). CAS manages approximately 35 horses and Simple Changes manages approximately five horses.

The existing barn, erected in 1976, is 104 feet wide and 248 feet long. It consists of an open wood frame pole barn, covered in light gage metal siding (4 foot wide) with opaque, translucent, plastic skylights. It consists of 46 stalls, a 190-foot by 60-foot indoor arena, manager's office, storage rooms, bathroom, mechanical room, two horse wash stalls, and a former hay storage area that functions as a smaller indoor setup/lesson area. The outdoor arena is located west of the barn and is accessible by a dirt pathway leading from the barn.

Figure 1-1. General Location Map

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.

1.3 PURPOSE OF THE PROPOSED ACTION

The purpose of the Proposed Action is to provide for safe and enjoyable public equestrian use of the Meadowood SRMA by implementing minor improvements within the existing barn and immediate vicinity as well as providing for temporary equestrian facilities onsite to ensure user groups and horses have access to safe conditions while construction occurs.

1.4 NEED FOR THE PROPOSED ACTION

As described in the 2014 EA, the Meadowood barn needs renovating to bring it into conformance with structural, plumbing, electrical, and Architectural Barriers Act (ABA) standards for Federal facilities. While the repairs are ongoing, temporary equestrian shelters and feeding areas are needed onsite outside of the barn to minimize and mitigate safety risks to humans and horses during the anticipated six-month construction timeframe. Having full access to the horses outside the barn during the construction period would also minimize disruption to horseback riding operations of CAS, Simple Changes, and the public.

Additionally, temporary lighting needs to be installed at the outdoor arena to allow for riding lessons and other activities to continue while the indoor arena is undergoing repairs. The indoor and outdoor arenas need to be graded to improve overall traction. Minor grading and improvements are also required immediately adjacent to the barn to improve drainage during rain events and to provide for improved storage facilities for manure and bedding materials for the stalls. Two of the pastures need to be brought into rotation in order to allow for rest-rotation of the pastures that would be used to accommodate the horses during construction to maintain long-term ecological conditions.

1.5 CONFORMANCE WITH BLM LAND USE PLAN(S)

The Proposed Action and alternatives described in this SEA are in conformance with the following existing BLM Land Use plans:

Meadowood Farm Planning Analysis/Environmental Assessment: The land use plan (Meadowood Farm Planning Analysis/Environmental Assessment) for the Meadowood SRMA was approved by the BLM Eastern States State Director on March 25, 2003. This plan contains the environmental analyses of activities approved for the Meadowood SRMA to meet broad planning goals and objectives.

Integrated Activity Management Plan/Environmental Assessment (IAMP/EA): An Integrated Activity Management Plan/Environmental Assessment (IAMP/EA) was completed in June 2004. The IAMP/EA identified allowable equestrian uses to include:

- public access to horseback riding trails, trailer parking and related facilities;
- access to equestrian facilities (i.e. indoor and outdoor riding arenas) for scheduled educational events;
- horseback riding lessons and riding and training clinics;
- private horse boarding under a concession lease, permit, contract, or agreement;
- facilities and pastures for Federal and other public service or non-profit organizations' horses; and
- programs and facilities accessible to disabled visitors.

1.6 RELATIONSHIPS TO STATUTES, REGULATIONS AND OTHER PLANS

Several laws, policies, and regulations guide management on the Meadowood SRMA, as summarized below:

- **Americans with Disabilities Act (ADA) of 1990**
The ADA prohibits discrimination and ensures equal opportunity for persons with disabilities in employment, State and local government services, public accommodations, commercial facilities, and transportation.
- **Architectural Barriers Act (ABA) of 1968 (Public Law 90-480)**
The ABA requires that facilities designed, built, altered, or leased with funds supplied by the United States Federal Government be accessible to the public.
- **Federal Land Policy and Management Act (FLPMA) of 1976 (Public Law 94-579)**
The FLPMA provides the BLM legal authority to establish public land policy, guidelines as amended for administering such policy and provides for the management, protection, development, and enhancement of public lands.
- **National Environmental Policy Act (NEPA) of 1969 (Public Law 91-190)**
The NEPA establishes national environmental policy and goals for the protection, maintenance, and enhancement of the environment and provides a process for implementing these goals within the Federal agencies. The Act also established the Council on Environmental Quality.
- **National Historic Preservation Act (NHPA) of 1966 (Public Law 89-665)**
The NHPA requires all Federal agencies to administer federally owned, administered, or controlled prehistoric and historic resources in a spirit of stewardship for the inspiration and benefit of present and future generations. The regulations, 36 CFR 800 Section 106, stipulate that prior to the expenditure of any Federal funds on any project, the agency must take into account the effect of the undertaking on any historic properties.
- **Clean Air Act (CAA)**
The CAA, as amended, is intended “to protect and enhance the quality of the Nation’s air resources so as to promote public health and welfare and the productive capacity of its population...” To achieve this goal, the CAA established two strategies for setting standards: (1) National Ambient Air Quality Standards (NAAQS) for six criteria pollutants; and (2) national emissions standards for individual sources of hazardous air pollutants. In addition, the CAA requires regulation of mobile sources of air emissions and a permit program for stationary sources.
- **Clean Water Act (CWA)**
The Federal Water Pollution Control Act, as amended by the Clean Water Act of 1977 (CWA), is intended to restore and maintain the chemical, physical, and biological integrity of the Nation’s waters. The CWA regulates the discharge of pollutants from point sources into waters of the United States. The CWA, as amended in 1987, requires each state to establish water quality standards for its surface waters derived from the amount of pollutants that can be assimilated by a body of water without deterioration of a designated use.
- **Endangered Species Act (ESA)**
The Endangered Species Act (ESA) provides for the identification and protection of Federally-listed threatened and endangered species of plants and animals and designations of critical habitat for animal species. The ESA prohibits all persons subject

to United States jurisdiction, including Federal agencies, from “taking” endangered species.

- **Chesapeake Bay Preservation Act and Chesapeake Bay Preservation Ordinance**
These two items establish Chesapeake Bay Resource Protection Areas, in which development is restricted to protect water quality in the Chesapeake Bay and associated watersheds.
- **Archaeological Resources Protection Act (ARPA) of 1979 (Public Law 96-95, as amended)**
The ARPA provides protection for archaeological resources on public lands by prohibiting the "excavation, removal, damage or defacing of any archaeological resource located on public lands or Indian lands," and set up criminal penalties for these acts. It also encourages increased cooperation and exchange of information between governmental authorities, the professional archaeological community, and private individuals having archaeological resources and data that were obtained before October 31, 1979.
- **Resource Conservation and Recovery Act (RCRA) of 1976**
The Resource Conservation and Recovery Act (RCRA) is the principal Federal law governing the disposal of solid waste and hazardous waste.
- **Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)**
CERCLA, commonly known as Superfund, authorizes the United States Environmental Protection Agency to respond to releases, or threatened releases, of hazardous substances that may endanger public health, welfare, or the environment.

In addition to these specific laws, BLM will comply with all other applicable Federal laws, regulations, executive orders, and policies.

1.7 SCOPING AND ISSUES

The BLM previously conducted scoping for the 2014 EA including public meetings on November 16, 2010 and June 28, 2011, in Lorton, Virginia, to obtain comments and address concerns from interested stakeholders. The 2014 EA was also available for a 30-day public comment period (which was extended due to complications with the comment functionality on the website). A great majority of the comments requested that the BLM consider:

- keeping the barn open and accessible during the repairs;
- completing the repairs in phases to accommodate current operations;
- scaling back the scope of the project to accomplish necessary and appropriate deferred maintenance repairs.

For this SEA, BLM conducted internal scoping and coordination with the primary user groups that would be affected by the Proposed Action. BLM worked with both groups, Simple Changes and CAS, to identify satisfactory options regarding temporary equestrian shelters and feeding areas that would be feasible and minimize impacts to their daily operations.

Based on an analysis of information gathered through scoping and internal coordination, this SEA will focus on the following resource issues:

- Cultural Resources

- Fish and Wildlife
- Hazardous Materials
- Human Health and Safety
- Recreation
- Soils
- Special-status species
- Vegetation
- Water Resources

Chapter 3, Section 3.1 provides a summary of all of the resources that were considered including the resources that were not carried forward for further analysis in the SEA.

2.0 DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

As discussed in the 2014 EA, the BLM proposes basic repairs to the Meadowood barn to meet structural, plumbing, electrical, and ABA standards for Federal facilities. These upgrades include the following:

- Structural repairs to include replacing columns, structural members including boards along the sidewalls and end walls, flat 2-inches by 4 inches in between roof trusses, stiffening and bracing of the roof structure, truss repair, and other bracing and blocking as needed
- Electrical improvements to include new wiring, conduit, waterproof fixtures, new light fixtures, new electrical service to the barn and removal of old wiring and fixtures
- Installation of a fire detection system including wiring
- An ADA-compliant accessible restroom with new fixtures, sink, and commode
- A new mechanical room for the water heater and storage
- Loose or worn out fasteners on the roof will be replaced and small holes caulked
- Upgrade to the drainage outfall for the horse wash stalls

The decision to implement these repairs is still valid and BLM will conduct these repairs in addition to the Proposed Action analyzed in this SEA. The Proposed Action is described in greater detail in the following sections.

2.1 PROPOSED ACTION (ALTERNATIVE ONE)

The Proposed Action includes a series of minor improvements in and around the Meadowood barn, as discussed below. Under the Proposed Action, all of the horses that are currently housed in the barn would need to be moved outside during the approximately six month construction period from September 2015 to March 2016. Horses managed by CAS (approximately 35 horses) would be accommodated in two of the main pastures located at Meadowood SRMA and horses managed by Simple Changes (approximately five horses) would utilize an existing farrier shed located just east of the barn. Simple Changes horses would continue to use the same pasture as they are currently using, located south of the barn. Figure 2-1 shows the proposed locations for the various projects.

Barn Improvements and Adjacent Vicinity. BLM would grade the interior walkways inside the barn as well as the indoor arena floor to provide for better traction and movement for people and horses. Additionally, grading would be conducted on the exterior east and west sides of the

barn. During heavy rain events, water flows into the barn and causes ponding and flooding. Grading on the east side would improve drainage and may include installation of a storm drain system to improve overall flow. On the west side of the barn, BLM would regrade the gravel area used for storing bedding material and install a new storage system to replace the existing containers to minimize overflow of the materials onto the ground. The actual design of the storage system has not yet been finalized, but the system would be constructed within the footprint of the area adjacent to the barn that is already disturbed.

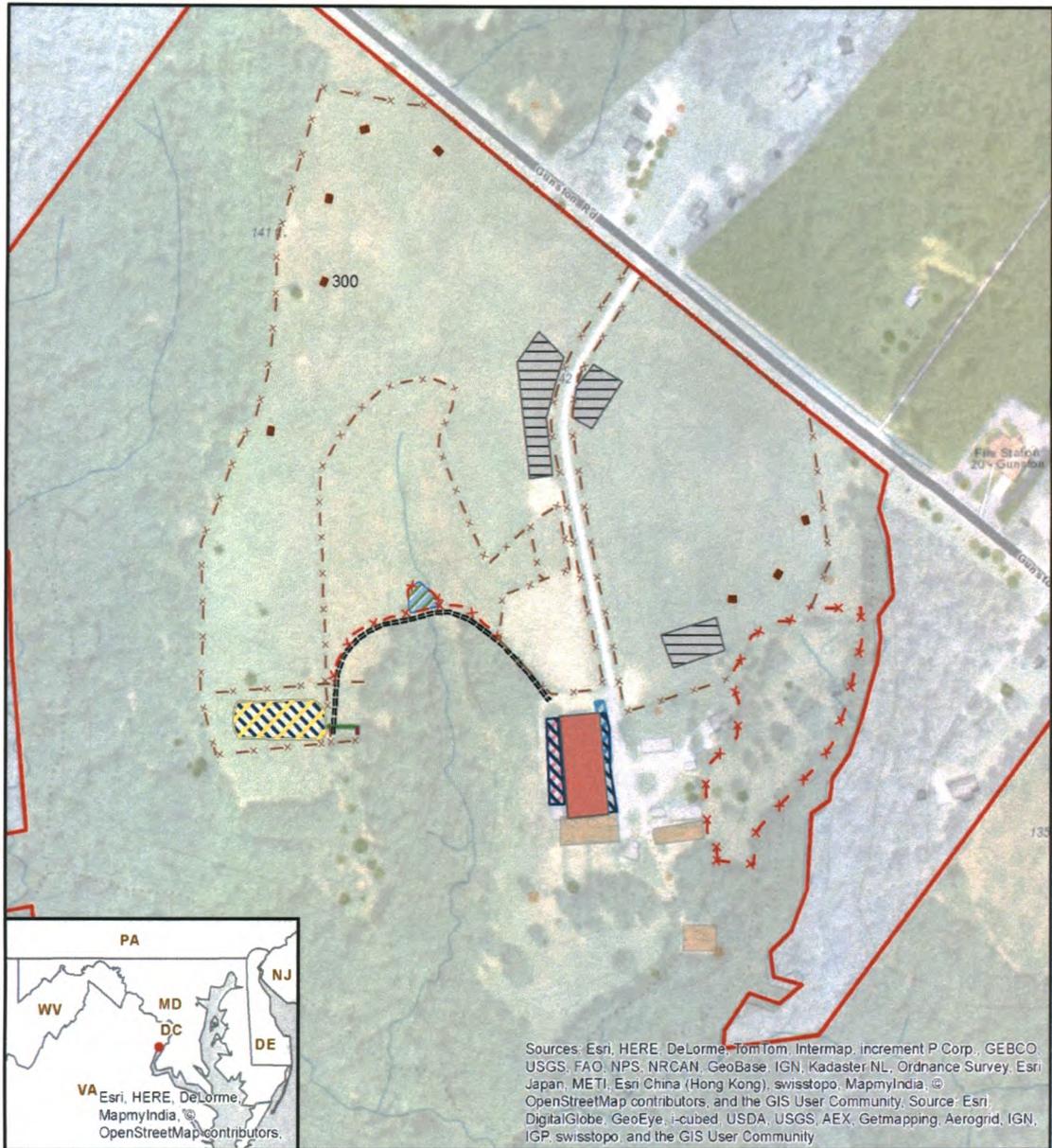
Temporary Equestrian Feeding Areas and Shelters. A temporary feeding area for mares and geldings managed by CAS would be set up within each of the two main pastures located along Gunston Road. The feeding areas would be temporary enclosures, constructed from panels with open railings, with a central corridor, “stall” for each horse, and a circular corral at one end. The feeding area for the geldings would be located on the western main pasture, along the fenceline near the entrance road. There are two options for siting the feeding area for the mares, one on the north side of the pasture and one on the south. Feeding areas need to be located adjacent to the water source and are therefore limited in terms of their placement within the pasture.

In addition to the temporary feeding areas, temporary shelters would be set up at a ratio of one shelter for every three horses. Based on this ratio, approximately 11 shelters would be needed. The shelters would be approximately 16 feet wide by 8 feet deep by 8 feet high to keep horses out of the elements. Shelters would be placed in the pastures along the high points and would be designed such that horses could enter and leave them as needed. The temporary shelters would rest on top of the ground. Both the shelters and feeding areas would be removed after construction is completed.

Pasture Rotation. Once construction is complete, two pasture areas would be rotated into use to allow for rest-rotation of the pastures that accommodated the horses during the construction period. One of the pasture areas is located to the west of the barn and the other is located to the east. These pastures are not currently being used to accommodate horses. Additional fencing would be constructed as needed, including surrounding a small pond and depression located on the pastures. Additionally, the unpaved recreational trail located within the east pasture would be rerouted along the existing tree line to ensure safe conditions are maintained for the public while horses are utilizing the pasture.

Outdoor Arena. Approximately eight pole-mounted lights would be installed at the outdoor arena and the outdoor arena floor would be graded and resurfaced to improve traction. A new, 35 kilowatt (kW) generator would be needed to provide power for the lights. The generator would be contained within a relocatable, temporary structure near the outdoor arena. The existing trail leading up to the outdoor arena would also be improved by grading and installing solar-powered lights along the trail.

Figure 2-1: Proposed Project Activities at Meadowood SRMA



Meadowood Supplemental Barn EA

Fence	Grading
Description	Wetlands
× - × Existing Fence	Staging Area
× - × Repair/Construct Fence	Run In Shelter
==== Access Road	Temporary Stalls
Barn	Meadowood Property
Generator	ManuerBeddingStorage
Electrical Conduit	Wetlands
Lighting	Drains



* No warranty is made by the Bureau of Land Management for use of map data for purposes otherwise intended by the BLM.

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Bureau of Land Management
Northeastern States District
626 E. Wisconsin Ave, Suite 200
Milwaukee, WI 53202

July 27, 2015
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Construction Staging. Up to three construction staging areas would be established on disturbed locations at Meadowood SRMA. Construction equipment, vehicles, and materials may be stored at these sites. Additionally, the indoor arena may be used to store materials during certain times within the construction period. Figure 2-1 shows the proposed locations for the construction staging areas.

A summary of the Proposed Action is provided in Table 2-1, including estimates of the proposed ground disturbance.

Table 2-1: Summary of Proposed Action

Proposed Improvement/Activity	Location	Ground Disturbance (Approximate)
<i>Barn Improvements</i>		
Grading inside the indoor arena and walkways within the barn	Barn	0.3 acre in areas already disturbed
<i>Temporary Equestrian Feeding Areas and Shelters</i>		
Installation of two temporary feeding areas for horses; one in each of the main pastures (i.e., one feeding area for geldings and one for mares) adjacent to the entrance to Meadowood SRMA. There are two possible locations for the mare feeding areas.	Main Pastures	0.6 acre
Installation of approximately 11 temporary equestrian shelters (2-3 shelters for mares; approximately 8 shelters for geldings) in the main pastures. Ratio is one shelter for every three horses.	Pastures	0.04 acre
<i>Pasture Rotation</i>		
After construction, two pastures would be rotated into use to provide for rest-rotation of the main pastures used to accommodate horses during construction and to maintain desired ecological conditions. Additional fencing would be constructed as needed, including surrounding a small pond and depression located on the pastures. On the east side of the southeast pasture, the existing recreational trail would be re-routed closer to the tree line to continue to provide public access and to maintain safety of visitors when horses are using the pasture.	Pastures	9.1 acres
<i>Outdoor Arena</i>		
Grade and incorporate new substrate into outdoor arena	Outdoor arena	0.5 acre primarily in areas already disturbed
Installation of temporary lighting at the outdoor arena, solar lights along the pathway leading up to the arena, and temporary storage of a generator to power the lights.	Outdoor arena	0.04 acre
<i>Grading Adjacent to Barn</i>		
Grading would be conducted on the east side of the barn to improve storm water drainage and prevent flooding into the barn during rain events.	Adjacent to Barn	0.08 acre
Grading would be conducted on the west side of the barn and new storage areas would be constructed for bedding materials.	Adjacent to Barn	0.2 acre in areas already disturbed

Proposed Improvement/Activity	Location	Ground Disturbance (Approximate)
<i>Construction Staging</i>		
Up to three staging areas for construction equipment.	Adjacent to barn, farrier shed, and hay storage areas	0.8 – 1 acre in areas already disturbed
<i>Use of Farrier Shed to House Therapeutic Riding Horses</i>		
The existing farrier shed to the southeast of the barn would be used to accommodate the horses belonging to Simple Changes, the non-profit therapeutic riding center located at Meadowood SRMA.	Farrier shed	None
APPROXIMATE TOTAL PROJECT SIZE: 12 ACRES		
APPROXIMATE TOTAL NEW GROUND DISTURBANCE: 10.1 ACRES		

2.2 ALTERNATIVE TWO

Under Alternative Two, BLM would implement the improvements described under the Proposed Action, with the following exception:

- Horses would not be accommodated in the main pastures overnight and therefore temporary shelters and feeding areas would not be needed. BLM would work with the contractor on the construction schedule such that construction would end in the early afternoon and horses would utilize the pastures only during the daytime.

Since construction materials may be stored within the indoor arena during certain times, lighting would still be needed at the outdoor arena to accommodate user groups while the indoor arena is inaccessible. Additionally, pasture rotation as described under the Proposed Action would also still be needed since the main pastures would experience heavier use than current conditions. Lighting at the outdoor arena would still be required since the indoor arena would not be available due to construction materials being stored inside and the regrading of the ground surface. The other projects are still needed for the reasons described in Chapter 1, Section 1.4, Need for the Proposed Action.

2.3 NO ACTION ALTERNATIVE

Under the No Action Alternative, BLM would conduct the Meadowood barn repairs that were identified in the 2014 EA but the additional improvements identified in the Proposed Action in this SEA, including grading around the vicinity of the barn to improve storm water drainage and storage of manure and wood chips, would not occur. Under the No Action Alternative, the outdoor lighting would not be installed at the outdoor arena, grading would not occur within the barn, indoor or outdoor arena, and horses would most likely remain in the barn during construction (horses would likely be moved around inside the barn to accommodate construction in a phased approach). This could result in minor disruptions to public use of the barn to ensure safety of the user groups during the construction period. The No Action Alternative is not considered a reasonable alternative because it does not fully address the needed improvements in and around the Meadowood barn; however, Council on Environmental Quality guidelines stipulate that

the No Action Alternative be analyzed to assess any environmental consequences that may occur if the Proposed Action is not implemented and to serve as a baseline for which to compare potential impacts. Therefore, this alternative is carried forward for analysis in this EA.

2.4 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM FURTHER ANALYSIS

In addition to the alternatives above, one alternative was considered but eliminated from further analysis, as summarized below:

- **An alternative in which another nearby stable would be temporarily utilized during the construction time period.** BLM conducted an inventory of available stables within a reasonable distance from Meadowood SRMA and none were found to be suitable or available. One facility, Woodlawn Stables, a recently decommissioned facility, was found to be unsuitable due to the condition of the property and was therefore not further considered as a possible location. Other stables were too far away or did not have enough facility space.

3.0 AFFECTED ENVIRONMENT

This chapter describes the resources considered and dismissed from detailed analysis in the SEA and existing environmental conditions within the boundaries of the Proposed Action and vicinity.

3.1 RESOURCE ANALYSIS

Twenty-four elements of the human environment (Table 3.1) were considered in evaluating the impacts associated with the Proposed Action and alternatives. Several resources were eliminated from further analysis in the SEA, because there would either be no impacts or negligible impacts to those resources. The rationale for dismissing those resources from further analysis is summarized in Table 3-1 below. Resources that can potentially be affected by the Proposed Action and alternatives are carried forward for further analysis and described in more detail in Chapters 3 and 4.

Table 3.1 - Affected Human Environment

Element	Carried forward for analysis	No further analysis needed	Rationale for dismissal
Air Quality/Visibility		X	Fairfax County is within an eight-hour non-attainment area for both ozone and small particulate matter (PM _{2.5}). The only potential for an increase in mobile sources of air emissions would be from operation of construction vehicles, but because of the intermittent and infrequent operation of construction vehicles onsite, impacts would be negligible and would not affect the status of the non-attainment zone for any air quality parameter. Construction activities may result in a temporary increase in fugitive dust in the air, but impacts would be minimized by dust suppression measures such as wetting the ground and avoiding construction on overly windy days; therefore impacts would be negligible. Gas/diesel generator(s) used to power the temporary outdoor arena lights would not produce notable emissions.

Element	Carried forward for analysis	No further analysis needed	Rationale for dismissal
Climate Change/Greenhouse Gases		X	The Proposed Action would result in a negligible increase in greenhouse gas emissions. Because of the intermittent use of mobile sources of emissions (construction vehicles), the Proposed Action would not have an appreciable effect on global climate change. Additionally, the Proposed Action is not anticipated to be measurably affected by future climate change conditions.
Noise		X	Additional vehicles and machinery coming onto the property are not likely to increase noise levels above the current use. Construction would be within the barn and grading would be similar in decibel levels and location to trucks bringing in feed, hay, and bedding materials as well as removing waste. Generators would be inclosed reducing decibel levels significantly.
Cultural Resources	X		
Environmental Justice		X	No impacts to low-income populations, minorities, or children. All impacts from the Proposed Action are located entirely on Meadowood SRMA and would not result in any environmental justice concerns.
Farmlands (Prime or Unique)		X	No impacts because the soil series comprising the project area do not contain prime or unique farmland.
Fish and Wildlife	X		
Floodplains		X	No impact because the project area is located in upland areas and is not located within a floodplain.
Geology/Mineral Resources/Energy		X	No impact on geological features or mineral resources because the Proposed Action would require minimal subsurface ground disturbance.
Groundwater		X	No impact because none of the proposed projects would require subsurface disturbance to a depth that would affect groundwater.
Hazardous Wastes	X		Removal of the existing indoor arena substrate poses a potential hazard as does the generators that will be placed in the pastures.

Element	Carried forward for analysis	No further analysis needed	Rationale for dismissal
Health and Human Safety	X		
Noxious and Invasive Plant Species	X		
Land Use		X	The Proposed Action would not change the overall land use at Meadowood SRMA.
Recreation	X		
Socioeconomics		X	No impact because the Proposed Action would not affect demographics, employment, income, or housing within the local community.
Soils	X		
Special-Status Species	X		
Traffic and Transportation		X	Construction vehicles would enter and exit Meadowood SRMA but no impacts to overall traffic flow are anticipated.
Vegetation	X		
Visual Resources		X	There would be temporary impacts to the visual environment within the immediate vicinity of the barn due to the presence of construction equipment and materials, but the impacts would only occur during the six month construction timeframe. Once construction is completed, all materials would be removed and the visual environment would be nearly the same.
Water Resources (Surface Water, Wetlands)	X		
Wild and Scenic Rivers		X	No impact because there are no Wild and Scenic Rivers present within the proposed project area.
Wilderness		X	No impact because there are no designated Wilderness areas located within or near the proposed project area.

3.2 CULTURAL RESOURCES

An archeological records search conducted through the Virginia Department of Historic Resources (VADHR) and a review of cultural resource survey reports and historic literature found at the NSD and

other locations revealed at least six cultural resources surveys had been completed between 2000 and 2014 at various locations throughout the Meadowood property. The most relevant to the current project are a survey conducted in 2003 for a proposed waterline paralleling both sides of the entrance road to the management facilities, and a full scale Section 110 survey of most, if not all, of the Meadowood property completed in 2004-2005. The former survey, conducted in land previously disturbed by plowing and road construction, discovered a moderate scatter of quartz flakes, a site type endemic to the region, and at least three historic artifacts (Ferone, *Waterline Survey Report*, 2003). The survey coverage is also near the proposed temporary feeding locations in both of the northern pastures. The artifact density did not constitute an “archaeological site” by VADHR standards during that time; combined with the possibility that some of the quartz debitage resulted from mechanical activities, the BLM determined that the proposed pipeline would result in “no adverse effect to historic properties.”

The 2004-2005 survey covered most of the Meadowood property and recorded at least 130 archeological sites, although no survey report accompanied these findings as the site records were submitted directly to VADHR. Of these sites, seven are located within the Area of Potential Effects (APE) of the proposed project and connected activities. All are located within the western pasture, except for one which extends across the access road into the eastern pasture. Five of these sites are prehistoric, the remainder being what are called “dual component” sites, which contain both historic and prehistoric elements; the sites in question contain historic artifacts from the early to mid-1800s. The riding arena, the adjacent parking area to the east, and a portion of the access road are in the middle of a dual component site recorded during the 2004-2005 survey.

A review of the Fairfax County Historic Imagery viewer determined that the pasture has been in existence since at least the 1930s, the only major change since that time being the construction of the existing administrative area and barns, as well as some minor changes to the boundary between the woodland and pasture. A house and associated outbuildings were also removed from the northern end of the pasture sometime between the 1950s and 1990s. Additionally, aerial photos from both the 1930s and 1950s indicated that the entire pasture had been plowed with visible furrows; a orchard also existed atop the current riding arena during the 1930s.

In consultation with VADHR at various points during the planning of this project, it was determined that only certain areas would require an archeological survey because of previous ground disturbance (see Section 4.1 for justifications). Consequently, on June 16-18, 2015, the NSD archaeologist conducted a BLM Class III/Phase I survey of the perimeter of the riding arena, adjacent parking area, and access road, confirming the existence of this site and its dual-component nature. Of the 73 archaeological shovel test pits performed in connection with this proposed project, 15 were positive with a total of 32 artifacts, 22 were prehistoric (all lithic debitage or tool making debris) and the remainder consisting of metal fragments, glass, and ceramics of unknown age. No more than two artifacts were found in any single pit, with one exception. This confirmed the presence of the known archaeological site and expanded its boundaries to the northeast for a short distance along the access road. Only two pits revealed anything of significance, including a chain with latch, a buckle, and several layers of thin tar at about 25 centimeters below the surface. These pits were located alongside the access road just outside of the site boundaries as currently defined. None of the sites recorded within the APE during the survey are considered eligible for listing on the National Register of Historic Places (NRHP).

The 2015 survey also revealed that the outdoor riding arena has been heavily disturbed because of a combination of cut and fill for its construction. The adjacent parking lot has also been significantly graded, and it appears that some of the material was taken off-site; it is speculated that some of this soil

was used as fill during the construction of the arena. Surveys conducted along the access road also revealed a high level of disturbance, most likely through plowing. In general, the survey confirmed the results of the pre-survey records search that the APE had been previously disturbed through construction or agricultural activities.

The Meadowood Barn was constructed in 1976 and has not yet met the 50-year threshold for listing in the NRHP. The NSD archaeologist conducted a walkthrough of the barn and surrounding areas proposed for grading and, in consultation with the BLM Eastern States Deputy Preservation Officer and VADHR, confirmed that the footprint of the barn and immediately adjacent areas have been heavily disturbed from previous construction and ongoing horse boarding activities.

3.3 HEALTH AND HUMAN SAFETY

The barn poses risks to the health and safety of both horses and people (Fairfax County Department of Public Works and Environmental Services, 2010; POZ Environmental, 2011). The barn has structural deficiencies arising from improper construction and decades of wear. Some of the barn's trusses are bowing, while others are decomposing, indicating that their load has exceeded their designed capacity. Some of the barn beams are notched at their points of highest load. Some of the roof purlins are oriented in the wrong direction, causing them to be weaker than they were designed to be. Portions of the roof have become detached from the supporting structure. Two-by-fours have been used to extend beams that were not long enough for their intended use. The leaky roof is allowing water to rot structural wood and to penetrate electrical fixtures, making them unsafe to use. Improper grading around the east and west sides of the barn has caused poor storm water drainage and pooling of water within the barn during rain events.

3.4 RECREATION

The main purpose of the Meadowood 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. Meadowood SRMA has a multiple use trail system that includes seven miles of equestrian trails and an outdoor riding arena. The existing barn structure and associated pastures provides equestrian recreational opportunities in the form of boarding, indoor/outdoor arena, grazing/loafing, and riding. Private boarding is available on a fee basis and conforms to the current lease structure for the facility.

3.5 SOILS

Soils in the decision area are primarily composed of fine silt loams and sandy loams (Natural Resources Conservation Service, 2015). There are some soils that contain iron sulfate found beneath topsoil in certain areas. A majority of the property has a T Erosion Factor of 5 and is well- to moderately-well drained. The T factor, also known as the soil loss tolerance, is the maximum amount of wind and water erosion that soil can withstand while supporting plant life. With a T factor of 5, soils can withstand a substantial amount of erosion and not be displaced. Although the substrates are well drained they have a high vulnerability for runoff. There is a slope that is greater than 10% near the southwest portion of the barn which directs water towards a finger drainage of Thompson Creek. Marine Clays have been known to be problematic in Fairfax County (Fairfax County Virginia, 2013) because of their cyclical ability to absorb water quickly and swell and therefore dry rapidly and shrink; however, on the Meadowood SRMA, these soils are not known to be found in a substantial quantity and are therefore not likely to impact the barn structure.

3.6 VEGETATION

The decision area contains two acres of upland forest primarily composed of American Beech (*Fagus grandifolia*) and ten acres of non-native grass including cold turf and forage species (Virginia Department of Conservation and Recreation, 2013). The remainder of the decision area contains gravel or dirt substrate and is not vegetated.

3.6.1 VEGETATION SPECIAL-STATUS SPECIES

Table 3.2 below lists special-status species that are known to occur or have potential to occur in Fairfax County, Virginia.

Table 3.2 - Vegetation Special-Status Species Known to, or Having Potential to, Occur in Fairfax County, Virginia

Species	Federal Status	State Status	Habitat	Reason for listing
*Small Whorled Pogonia	Listed Threatened	Listed Endangered	This orchid grows in older hardwood stands of beech, birch, maple, oak, and hickory that have an open understory. Sometimes it grows in stands of softwoods such as hemlock. It prefers acidic soils with a thick layer of dead leaves, often on slopes near small streams.	The primary threat to the small whorled pogonia is the past and continuing loss of populations when their habitat is developed for urban expansion. Some forestry practices eliminate habitat. Also, habitat may be degraded or individual plants lost because of recreational activities and trampling.
Torrey's Mountain-mint	Not Listed (Species of Concern)	Not Listed	Dry, rocky, deciduous woods, along roadsides, and in thickets near streams. One occurrence has been found on the western slope of an exposed ledge with the following associate plant species: <i>Cheilanthes lanosa</i> , <i>Danthonia spicata</i> , <i>Triosteum angustifolium</i> , and other herbaceous xerophytes. At another occurrence in an open right-of-way through an extensive oak-hickory forest, plants were found on the southwest slope of a small diabase knob in dry, rocky silt loam with plant associates such as <i>Helianthus divaricatus</i> , <i>Phaseolus polystachios</i> , <i>P. tenuifolium</i> , and woody invading species such as <i>Cercis canadensis</i> and <i>Rubus</i> spp. Occurrences within this state have been found at elevations ranging from 35-1400 feet. (VA DNH 1992b).	Primary threats include succession and invasion of habitat by exotic, weedy plants, such as Japanese honeysuckle (<i>Lonicera japonica</i>). Spraying of herbicides by railroad, highway, or utility crews for right-of-way maintenance threatens populations near these corridors. Other threats to populations include habitat destruction due to general development, road construction, timber harvest, soil disturbance, refuse dumping, trampling by humans, horses, and tractors, and recreational pressures.

Species of Concern is not a regulatory category. Sources: Federally-listed species (United States Fish & Wildlife Service, 2015); State-listed species and species of concern (NatureServe, 2015).

* indicates that the species was only found at the county level not the decision area for the federal T&E search

3.7 NOXIOUS AND INVASIVE PLANT SPECIES

There are known noxious and invasive plant species in Fairfax County, including Japanese honeysuckle (*Lonicera japonica*), Japanese stiltgrass (*Microstegium vimineum*), tree of heaven (*Ailanthus altissima*), porcelain berry (*Ampelopsis brevipedunculata*), garlic mustard (*Alliaria petiolata*), mimosa or silk tree (*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). Chinese lespedeza (*Lespedeza cuneata*) is the only identified invasive plant species within the decision area.

3.8 WATER RESOURCES (SURFACE WATER, WETLANDS)

The perennial streams on the Meadowood SRMA fall within the Mill Branch watershed and the Kane Creek watershed. These watersheds are two of only three watersheds in Fairfax County that are designated for “Watershed Protection,” a designation given to only the healthiest watersheds which are found in areas with low development density and contain streams with healthy biological communities.

The surface water on the Meadowood property is limited to a small man made wetland (0.1 acre) and Thompson Creek, approximately 780 feet long. The small wetland is located within one of the pastures that is proposed for rotation, but it would be fenced. Thompson Creek is not located within the decision area.

Pooling water within the barn has been an ongoing issue, resulting from poor drainage and improper grading surrounding the barn. The grading around the barn is flat and slightly angled downward toward the barn allowing water to accumulate and not drain.

3.9 WILDLIFE

The decision area contains a mature beech forest with a portion of Thompson Creek that drains to Belmont Bay. The forest provides habitat for a wide variety of wildlife, such as birds, mammals and amphibians, and the stream contains small fish, aquatic macroinvertebrates, reptiles, and amphibians. The Meadowood barn structure likely provides habitat for a few bird species, small rodents, and other small animals that are well-adapted to human environments.

3.9.1 WILDLIFE SPECIAL-STATUS SPECIES, MIGRATORY BIRDS, INVASIVES

Table 3.3 below lists special-status species that are known to occur or have the potential to occur in Fairfax County, Virginia in habitat types that are present at Meadowood SRMA.

Table 3.3 - Wildlife Special-Status Species Known to, or Having Potential to, Occur in Fairfax County, Virginia

Species	Federal Status	State Status	Habitat	Reason for listing
*Bald eagle	Recovery	Not Listed	Bald Eagles live near rivers, lakes, and marshes where they can find fish, their staple food. Bald Eagles will also feed on waterfowl, turtles, rabbits, snakes, and other small animals and carrion. Bald Eagles require	Forty years ago, our national symbol was in danger of extinction throughout most of its range. Habitat destruction and degradation, illegal shooting, and the contamination of its food source, largely as a consequence of DDT decimated the eagle population.

Species	Federal Status	State Status	Habitat	Reason for listing
*Bald eagle, continued			a good food base, perching areas, and nesting sites. Their habitat includes estuaries, large lakes, reservoirs, rivers, and some seacoasts. In winter, the birds congregate near open water in tall trees for spotting prey and night roosts for sheltering.	Habitat protection afforded by the Endangered Species Act, the federal government's banning of DDT, and conservation actions taken by the American public have helped Bald Eagles make a remarkable recovery. Bald Eagles were removed from the endangered species list in August 2007 because their populations recovered sufficiently. Bald and Golden eagles are protected under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Act (Eagle Act)
Northern Long-eared Bat	Threatened	Not Listed	During summer, northern long-eared bats roost singly or in colonies underneath bark, in cavities, or in crevices of both live and dead trees. Males and non-reproductive females may also roost in cooler places, like caves and mines. This bat seems opportunistic in selecting roosts, using tree species based on suitability to retain bark or provide cavities or crevices. It has also been found, rarely, roosting in structures like barns and sheds. Northern long-eared bats spend winter hibernating in caves and mines, called hibernacula. They typically use large caves or mines with large passages and entrances; constant temperatures; and high humidity with no air currents. Specific areas where they hibernate have very high humidity, so much so that droplets of water are often seen on their fur. Within hibernacula, surveyors find them in small crevices or cracks, often with only the nose and ears visible.	White-nose syndrome, a fungal disease known to affect bats, is currently the predominant threat to this bat, especially throughout the Northeast where the species has declined by up to 99 percent from pre-white-nose syndrome levels at many hibernation sites. Although the disease has not yet spread throughout the northern long-eared bat's entire range (white-nose syndrome is currently found in at least 25 of 37 states where the northern long-eared bat occurs), it continues to spread. Experts expect that where it spreads, it will have the same impact as seen in the Northeast.
Wood Turtle	Not Listed (under review)	Listed Threatened	Wood turtles live along permanent streams during much of each year but in summer may roam widely overland and can be found in a variety of terrestrial habitats adjacent to streams, including deciduous woods, cultivated fields, and woodland bogs, marshy pastures. Use of woodland bogs and marshy	The species has been seriously impacted by illegal collection. Entire populations along some streams have been eliminated. As a result, the distribution is now more discontinuous than it once was, and gene flow has certainly been reduced in some areas. Collection for pet trade (now illegal in most of the range) is wood turtles. In the north, where

Species	Federal Status	State Status	Habitat	Reason for listing
Wood Turtle, continued			fields is most common in the northern part of the range.	the major threat to the survival of development pressure is not great, collection may be the only serious threat. Collectors can easily clean out an entire population along many miles of stream in only one or two seasons of collecting, by timing collection to coincide with the turtles' emergence from hibernation. Although the level of illegal collecting is undocumented, experts in most states surveyed mentioned collecting as a major threat in their state.
*Dwarf Wedgemussel	Endangered	Not Listed	The dwarf wedge mussel lives on muddy sand, sand, and gravel bottoms in creeks and rivers of various sizes. It requires areas of slow to moderate current, good water quality, and little silt deposition. The species' recent dramatic decline, as well as the small size and extent of most of its remaining populations, indicate that individual populations remain highly vulnerable to extirpation.	Always a rare species confined to Atlantic slope drainages from North Carolina to New Brunswick, the dwarf wedge mussel has been recorded in approximately 70 localities in 15 major drainages since the species' discovery in the early 1800s. It is now thought to have been extirpated from all but 20 localities. The 20 known remaining populations, with one exception, are thought to be relatively small and to be declining as a result of continued environmental assaults in the form of agricultural, industrial, commercial, and domestic pollution/runoff. Channelization, removal of shoreline vegetation, development, and road and dam construction also threaten some populations.
Brook Floater	Not Listed (under review)	Listed Endangered	No data on natureserve.org	No data on natureserve.org
Appalachian Springsnail	Not Listed (Species of Concern)	Listed Endangered	(100-250 square km (about 40-100 square miles) This species is known from a few localities in the Potomac River basin of the District of Columbia and Maryland and Shenandoah River basin of northwestern Virginia in caves and small springs (Hershler et al., 1990).	No data on natureserve.org
Holsinger's Groundwater Planarian	Not Listed (Species of Concern)	Not Listed	No data on natureserve.org	No data on natureserve.org

Species	Federal Status	State Status	Habitat	Reason for listing
Bigger's Groundwater Planarian	Not Listed (Species of Concern)	Not Listed	No data on natureserve.org	No data on natureserve.org

Note: Species of Concern is not a regulatory category. Sources: Federally-listed species (United States Fish & Wildlife Service, 2015); State-listed species and species of concern (NatureServe, 2015).

* indicates that the species was only found at the county level not the decision area for the federal T&E search

Table 3.4 lists migratory bird species protected under the Migratory Bird Species Treaty Act that could occur within the decision area or within Fairfax County, Virginia. The warblers, sparrows, owl, eagle, cuckoo and blackbird are probably more likely to be seen in the decision area. Bitterns are usually found in swampy wetland areas and are not likely to be seen within the decision area. Sandpipers, dowitchers, egrets, and oystercatchers are all shorebirds and are not likely to be seen within the decision area.

Table 3.4 - Migratory Bird Species with Potential to Occur Within Decision Area or Fairfax County, Virginia

Species Name	Bird of Conservation Concern	Seasonal Occurrence
American oystercatcher	Yes	Year-round
American Bittern	Yes	Wintering
Bald eagle	Yes	Year-round
Black-billed Cuckoo	Yes	Breeding
Blue-winged Warbler	Yes	Breeding
Fox Sparrow	Yes	Wintering
*Golden-winged Warbler	Yes	Breeding
Gull-billed Tern	Yes	Breeding
*Horned Grebe	Yes	Wintering
Kentucky Warbler	Yes	Breeding
Least Bittern	Yes	Breeding
Pied-billed Grebe	Yes	Breeding
Prairie Warbler	Yes	Breeding
Prothonotary Warbler	Yes	Breeding
Purple Sandpiper	Yes	Wintering
*Red Knot	Yes	Wintering

Species Name	Bird of Conservation Concern	Seasonal Occurrence
Red-headed Warbler	Yes	Year-round
Rusty Blackbird	Yes	Wintering
Short-billed Dowitcher	Yes	Wintering
Short-eared Owl	Yes	Wintering
Snowy Egret	Yes	Breeding
Wood Thrush	Yes	Breeding
Worm eating Warbler	Yes	Breeding

* indicates species were found at the county level but not the decision area.

Source: United States Fish & Wildlife Service, 2015

There are no known invasive wildlife or insect species that occur within the decision area.

3.10 HAZARDOUS MATERIALS

It was recently discovered that the substrate within the indoor riding arena consists of dirt and old ground up tires. As the rubber from the tires degrades, the ground below the riding arena could become contaminated. Upon discovery of this issue, the soils below the substrate were sampled on December 19, 2014, for Diesel Range Organics (DRO). Results show an elevated level at 75.1 mg/kg, which is above the residential rate of 50 mg/kg, but below the industrial standard of 500 mg/kg. The barn would fall under the industrial limit (B. Kennedy, personal communication, January 22, 2015).

No other areas of hazardous materials are known to exist within the decision area.

4.0 ENVIRONMENTAL IMPACTS OF ALTERNATIVES

This chapter describes the process used to identify potential direct, indirect, and cumulative impacts related to the Proposed Action at Meadowood SRMA and discusses the impacts to the resources analyzed in this SEA.

Direct impacts are caused by the action and occur at the same time and place; **indirect impacts** are caused by the action and are later in time or further removed in distance, but are still reasonably foreseeable (40 CFR 1508.8).

In addition to identifying the direct and indirect environmental impacts of their actions, the CEQ's NEPA regulations require Federal agencies to address cumulative impacts related to their proposals. A **cumulative impact** is defined in the CEQ regulations (40 CFR Part 1508.7) as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time."

The process outlined by CEQ includes identifying significant cumulative impacts issues, establishing relevant geographic and temporal (time frame) extent of the cumulative effects analysis, identifying other actions affecting the resources of concern, establishing the cause-and-effect relationship between the Proposed Action and the cumulative impacts, determining the magnitude and significance of the cumulative impacts, and identifying ways in which the agency's proposal might be modified to avoid, minimize, or mitigate significant cumulative impacts.

4.1 CULTURAL RESOURCES

4.1.1 No Action Alternative

The No Action Alternative would not result in any effects to cultural resources aside from those currently taking place from grazing and the use of the outdoor riding arena and associated access road.

4.1.2 Proposed Action

The Proposed Action would result in effects to the archaeological site located around the outdoor riding arena, as described in Section 3.2. The NSD submitted a report of the findings for the June 2015 survey to VADHR on July 16th, 2015, via ePIX, the VADHR online-submission website. The report asked for concurrence by VADHR that there will be no adverse effects to historic properties for all aspects of the proposed project as listed below with the rationale(s):

1. Barn reconstruction and adjacent grading: No adverse effect - barn is less than 50 years old and the area immediately around it has previously been disturbed by construction and ongoing horse boarding activities.
2. Outdoor arena grading and light installation: No adverse effect - the outdoor arena was constructed by a combination of cut and fill; artifacts found in shovel test pits at this location were located in heavily disturbed soil.
3. Parking area adjacent to barn and riding arena: No adverse effect - area has been heavily graded, and some of the soil appears to have been removed and possibly used in the construction of the arena.
4. Outdoor arena access road: No adverse effect - all artifacts found in the shovel test pits are below the proposed level of grading for the access road; additionally, the density of the artifacts located is very low and the installation of any light poles would not result in a loss of integrity to the site.
5. Temporary feeding corrals and horse shelters: No adverse effect - no permanent structures would be constructed and all known cultural resources would be avoided by design.

VADHR concurred with the BLM's findings by letter on June 17th, 2015, that there would be no adverse effects to historic properties for the proposed project. The VADHR also requests that all employees or contractors be trained prior to beginning work on the identification of archaeological resources. Upon finding any archaeological remains, work would be halted at that location and the contractors would contact the BLM or other archaeologist assigned to the project for further evaluation.

4.1.3 Alternative Two

Alternative Two would eliminate the intense disruption of the pasture areas where temporary stalls are placed and immediate surrounding areas. Since the Proposed Action would result in no adverse effects to historic properties, impacts from implementing Alternative Two would be the same as described for the Proposed Action.

4.2 HEALTH AND HUMAN SAFETY

4.2.1 No Action Alternative

The No Action Alternative implements the Proposed Action described in the 2014 EA (see Chapter 2.0 above), that approved basic repairs to the Meadowood barn to meet structural, plumbing, electrical, and ABA standards for Federal facilities. The No Action Alternative would not include the additional minor improvements described in the Proposed Action described in Chapter 2.1. Allowing horses and employees to stay in the barn during phased repairs could result in injuries. Risks to people and animals from poor indoor air quality in the indoor arena and other issues would continue until the repairs were completed. A portion of the barn may fail during repairs, causing a large piece of metal or wood to fall on a person or an animal, potentially resulting in serious injury or death. Regrading around the barn would not take place, causing continued flooding into the barn during current and future rain events, which poses potential safety risks to personnel utilizing the barn.

4.2.2 Proposed Action

Under the Proposed Action, the use of quality new or refurbished materials for repairs and adherence to structural, plumbing, electrical and ABA standards for Federal facilities would result in a barn that is structurally sound with safer functioning ventilation, electrical, and plumbing systems. Grading would be conducted on the east and west sides of the barn to improve storm water drainage and prevent flooding into the barn during rain events. New storage areas would be constructed for bedding materials. New substrate beneath the indoor and outdoor arenas would help alleviate footing problems. The installation of temporary lighting at the outdoor arena and solar lights along the pathway leading up to the arena would safely provide visibility to both users and horses. Standard operating procedures and safety protocols would be implemented in the contract to minimize potential risk of injury. Therefore, implementing the Proposed Action would result in benefits to health and safety at Meadowood SRMA.

4.2.3 Alternative Two

Impacts would be the same as for the Proposed Action, except that there would be a potential injury risk to both users and horses when the horses are moved from inside the barn, where construction activities would take place, to the pastures, and then returned to the barn after construction activities cease for the day.

4.3 RECREATION

4.3.1 No Action Alternative

The No Action Alternative implements the Proposed Action described in the 2014 EA (see Chapter 2.0 above), that approved basic repairs to the Meadowood barn to meet structural, plumbing, electrical, and ABA standards for Federal facilities. The No Action Alternative would not include the additional minor improvements described in the Proposed Action (Chapter 2.1). The No Action Alternative could result in intermittent disruptions to recreation since horses would need to be shifted around inside the barn as construction occurs, but overall there would be no permanent impact on recreation. Public riding lessons, the public therapy program and boarding, day use of the trails, the outdoor arena, and some pasture riding areas would continue to be available during the time of construction. During the winter months, riding lessons taking place in the outdoor arena would need to end in the late afternoon/early evening, before daylight ends, since lighting would not be installed at the outdoor arena.

4.3.2 Proposed Action

Under the Proposed Action, all of the horses that are currently housed in the barn would be moved outside during the six month construction period. Horses managed by CAS would be accommodated in two of the main pastures located at Meadowood SRMA and horses managed by Simple Changes would utilize an existing farrier shed located just east of the barn. Simple Changes horses would continue to use the same pasture as they are currently using, located south of the barn and would be allowed to expand into the southeast pasture. The recreational trail that runs through the southeast pasture would be moved to follow the fenceline, but would not hinder or change recreational opportunities. The Proposed Action would have no permanent impact on recreation, since it would preserve public riding lessons, the public therapy program and boarding; day use of the trails, the outdoor arena, and some pasture riding areas would also continue to be available during the time of construction.

4.3.3 Alternative Two

Under Alternative Two, impacts to recreation would be the same as for the Proposed Action.

4.4 SOILS

4.4.1 No Action Alternative

Under the No Action Alternative, soil conditions would remain the same or continue to worsen as a result of continued grazing. Proposed repairs would be limited to the footprint of the existing barn, resulting in no additional soil disturbance except for ongoing grazing activities and heavy use areas in the main pastures. Continued grazing in the pastures without bringing additional pastures into rotation could result in less vegetation and increase the likelihood for more severe wind and water erosion within the decision area.

4.4.2 Proposed Action

With the Proposed Action, soil quality would temporarily be lost due to compaction and devegetation in the pasture areas where the temporary stalls are placed and the immediate surrounding areas where temporary shelters are located. Once barn construction is complete, the soil may need to be decompacted in the main pastures before being re-seeded with a grass seed mixture that best suits the soil type and utilization reducing chances for wind and water erosion. Bringing the two additional pastures into rotation could allow the main pastures to recover and lessen the potential long-term impacts on soils.

4.4.2.1 Mitigation

To properly introduce seeds, disking or ripping may be required in order to decompact soils prior to seeding. If vegetation is not successful within the first growing season following seeding, soil samples would be taken to determine if any soil amendments need to be added and seed mix would be further reviewed.

4.4.3 Alternative Two

Alternative Two could result in similar impacts for soil compaction, but likely lower impacts to soils overall than the Proposed Action because it could eliminate the intense soil disruption of the pasture areas where temporary stalls are placed and the immediate surrounding areas where temporary shelters are located. Horses would be turned out in the main pastures during the day and would return to the barn at night.

4.5 VEGETATION

4.5.1 No Action Alternative

Vegetation conditions in the pastures would remain the same or could worsen under the No Action Alternative due to continued over grazing. In the areas surrounding the barn there would be less impact, because grading and other projects would not occur.

4.5.2 Proposed Action

Of the ten acres of grassland habitat within the decision area, approximately 3.7 acres would be disturbed by temporary structures, moving vehicles, heavy machinery, and extensive foot or hoof traffic. Some minor vegetation clearing would be required to reroute the trail on the east side of the southeastern pasture. The decision area that would be impacted includes:

- four feet on each side of the 850 foot re-graded access road that connects the barn to the outdoor riding arena (≈ 0.3 acre);
- a four foot boundary surrounding the outdoor riding arena and the inside of the outdoor riding arena (≈ 0.4 acre);
- regrading near barn (≈ 0.25 acre); staging areas (≈ 0.75 acre); temporary stalls (≈ 0.75 acre);
- areas immediately surrounding temporary stalls where there would be high levels of traffic and soil compaction ($\approx 0.75 - 1$ acre); and
- rerouting of trail in southeastern pasture (≈ 0.2 acre)

These areas could experience some native/pasture habitat loss and become highly susceptible to invasives or weedy species. BLM would revegetate disturbed areas after construction is completed with a similar seed mix to what would be used in the pasture. Areas that normally do not have vegetation and where vegetation is not desired, such as staging areas, would be monitored for invasive species.

4.5.2.1 Mitigation

The optimal seed mix recommended for foraging in the Chesapeake Bay Watershed is a mixture of 3.5 lb. big bluestem (*Andropogon gerardii*), 3.5 lb. Indian grass (*Sorghastrum nutans*), and 3.0 lb. little bluestem (*Schizachyrium scoparium*) per acre (Harper, Bates, Gudlin, & Hansbrough, 2004). These warm season grasses are known to be drought tolerant and capable of growing in poor quality soils. Cool season grasses are not recommended because of their association with an endophyte fungus which can be detrimental to horse health. Warm season grasses usually have a yield of 2-5 tons per acre, this number may fluctuate depending on rain and soil conditions. If cool season grasses are grown with warm season grasses, typically the cool season grasses will begin to dominate, making field less desirable and unhealthy for foraging. The use of cool season grasses could also lead to overgrazing because cool season grasses do not grow as well in warmer and dry months when the horses graze the most. For grass planting to be successful, it is recommended that it not be planted any deeper than $\frac{1}{4}$ " below surface, planted between mid-April to early June, and traffic on seed be reduced until roots are established (Virginia Department of Game and Inland Fisheries, 2015b). Establishing a temporary fence around the perimeter of newly seeded areas for one growing season would prevent grazing horses from inhibiting growth by pulling up grass seedlings or trampling grass.

4.5.3 Alternative Two

Alternative Two would result in fewer impacts to vegetation than the Proposed Action because it would eliminate the intense disruption of the pasture areas where temporary stalls are placed and the immediate surrounding areas where temporary shelters are located. Horses would be turned out in the main pastures during the day and would return to the barn at night. This would result in an increased potential for trampling of vegetation in the pastures over current conditions, but bringing the two additional pastures into rotation would allow the main pastures to recover and lessen the potential long-term impacts to vegetation.

4.6 VEGETATION SPECIAL-STATUS SPECIES

4.6.1 No Action Alternative

Special-status vegetation species are not expected to be affected under the No Action Alternative since proposed repairs would be limited to the footprint of the existing barn.

4.6.2 Proposed Action

Since the Proposed Action would take place entirely within the existing barn footprint, heavily grazed pastures, and disturbed areas containing no vegetation, the actions as proposed would not affect known threatened, endangered, or candidate plant species within the Meadowood SRMA. As described in Section 3.6.1, none of the special-status plant species occur in the habitat types that would be affected by the Proposed Action. Grading and placement of temporary stalls would result in the loss of vegetation within the decision area, but would be reseeded upon project completion.

4.6.2.1 Mitigation

Areas disturbed would be reseeded with an appropriate seed mixture after construction is completed not only for aesthetics, but to stabilize soil and runoff in the area.

4.6.3 Alternative Two

Special-status species are not expected to be affected under Alternative Two, for the reasons described for the Proposed Action.

4.7 NOXIOUS AND INVASIVE PLANT SPECIES

4.7.1 No Action Alternative

The only identified noxious or invasive plant species within the decision area is Chinese lespedeza (*Lespedeza cuneata*). It is essential that mitigation measures are used to ensure that these species are not brought onto the property from off site during the proposed barn repairs. Mitigation measures would be the same as for the Proposed Action.

4.7.2 Proposed Action

The only identified noxious or invasive plant species within the decision area is Chinese lespedeza (*Lespedeza cuneata*), which has been observed in the pasture area. In areas where there may be soil disturbance such as grading, heavy foot/hoof traffic or compaction of soil, there is the potential for invasive species to establish and increase in numbers. Invasive species could also be brought into the decision area on construction vehicles and equipment. It is essential that mitigation measures are used to ensure that new invasive species are not brought into the decision area from offsite and Chinese lespedeza (*Lespedeza cuneata*) does not spread.

4.7.2.1 Mitigation

BLM would require the contractor to implement mitigation measures such as power washing construction vehicles prior to entering the property to avoid bringing invasive or noxious weed species seeds onto the property. This could be achieved by utilizing a car/truck wash prior to entering the property to remove all visible dirt, seeds, or other debris from each vehicle or piece of equipment. If invasive species are inadvertently brought onto the property, proper measures would be taken immediately to avoid their spread. If found, affected areas would be treated and monitored until the invasive species are no longer a threat. Chinese lespedeza (*Lespedeza cuneata*) would also need to be treated and monitored following the completion of construction.

4.7.3 Alternative Two

The only identified noxious or invasive plant species within the decision area is Chinese lespedeza (*Lespedeza cuneata*). Mitigation measures would be implemented to ensure that these species are not brought onto the property from off site during the proposed construction activities. Mitigation measures would be the same as for the Proposed Action.

4.8 WATER RESOURCES (SURFACE WATER, WETLANDS)

4.8.1 No Action Alternative

If the Proposed Action is not approved, water runoff and pooling of water within the barn would continue. Additionally, the area adjacent to the barn containing bedding materials would not be improved, which could increase the potential for runoff into the nearby tributary.

4.8.2 Proposed Action

Due to the slope of the property near where the barn is located there is a high potential for topsoil runoff especially during an intense wind or rain event, which could result in minor to moderate adverse impacts to surface waters. Therefore, best management practices and mitigation measures including those described in Section 4.8.2.1 would be implemented to control erosion and minimize runoff. The small wetland and depression located within the pastures proposed to come into rotation would be fenced to keep horses out of these areas and would therefore not be affected by the Proposed Action. Upon project completion, areas around the barn and pastures would be stabilized, reducing impacts of runoff.

4.8.2.1 Mitigation

Straw wattles, silt fence, or a barrier shall be utilized to prevent construction debris and sediment from coming in contact with surface water such as Thompson Creek. Seeding of disturbed areas would be completed at the earliest convenience to help further stabilize soils from being washed away. If drainage continues to be an issue after the area is graded and revegetated, other mitigative actions may need to be put into place (i.e. equipping the barn with a gutter system, culverts with rock bibs, drainage tile, or other as determined appropriate). Depending on which method is chosen, based on the need, it would be designed to disperse the energy of the water to prevent rutting and surface runoff that could damage the vegetation causing further impacts to surface waters.

4.8.3 Alternative Two

Impacts under Alternative Two would be the same as described for the Proposed Action.

4.9 WILDLIFE

4.9.1 No Action Alternative

The No Action Alternative would result in no net change in effect to wildlife from what was analyzed in the 2012 and 2014 Meadowood Barn EAs.

4.9.2 Proposed Action

Noise related to the actions could cause stress and avoidance to some wildlife species. However, noise created by the project would be short in duration and would only occur during daylight hours. With most of the proposed actions taking place in and around the barn there would likely be no new impact to wildlife since there is continuous active use of the barn, its associated parking area, and loading zones where trucks are regularly utilized for day to day operations and maintenance actions. All actions as proposed would occur in areas of urbanization and/or heavily grazed pastures and would have little to no impact on wildlife in the area.

Temporary horse stalls placed along the access road to the barn and other facilities would cause no further resource damage than has already occurred due to ongoing grazing and would likely have no impacts to wildlife due to their placement. Mobile species such as mammals and birds utilizing the pastures may temporarily move to another location while the structures are in place. When the barn project is complete, the horses would once again be housed in the barn and some areas of the pastures currently bare of vegetation would be rehabilitated. The act of rotating some pastures that have not been utilized recently may prove beneficial for some wildlife species.

4.9.3 Alternative Two

This alternative would not require temporary horse stalls placed in the pasture, but all other actions would remain the same. Therefore, there would be little to no difference in the impacts to wildlife between the Proposed Action and Alternative Two.

4.10 WILDLIFE SPECIAL-STATUS SPECIES MIGRATORY BIRDS

4.10.1 No Action Alternative

The No Action Alternative would result in no net change in effect from what was analyzed in the 2012 and 2014 Meadowood Barn EAs.

4.10.2 Proposed Action

Since the extent of the Proposed Action would be temporary and would take place within areas of urbanization and/or heavily grazed pasturelands with ongoing active use, the Proposed Action would result in no effect to threatened, endangered, candidate species or migratory birds. As described in Table 3.3, the habitat types supporting special-status wildlife species are not present within the proposed decision area. If any migratory birds are utilizing the pastures, they may be temporarily displaced from the specific areas containing the temporary shelters and feeding areas, but there would be no permanent impacts. Given the large amount of pasture available at Meadowood, there would be sufficient habitat to support migratory bird species during the proposed construction period. Bringing the new pastures into rotation would have minimal effects to migratory birds and no effect on threatened, endangered, or candidate species for these same reasons.

4.10.3 Alternative Two

Impacts would be nearly identical to those described under the Proposed Action, except there would be no temporary feeding areas or shelters, and horses would be utilizing the main pastures during the day.

4.11 HAZARDOUS MATERIALS

4.11.1 No Action Alternative

With the No Action Alternative, repairs would be implemented as described in the 2014 EA (see Chapter 2.0 above) including removal and replacement of the substrate of the indoor riding arena, which would prevent further potential contamination of the ground underneath the riding arena. Mitigation would also occur as noted for the Proposed Action in section 4.11.2 below.

4.11.2 Proposed Action

As proposed, the substrate of the indoor riding arena would be removed, the soil under it graded, and a new more environmentally friendly substrate would be utilized. Grading the soil would allow for aeration of the soils and would likely aid in the breakdown of the material as would any maintenance grading. The old substrate would be disposed of at an approved waste disposal facility. Contamination would likely break down over time especially if allowed to aerate and receive some natural sunlight. Soaps utilized to clean the horses may also break them down over time. Once the substrate is removed there should be no further contamination.

Part of this project includes providing temporary horse stalls during construction and temporary lighting at the outdoor riding arena. These facilities would be powered by gas/diesel powered generators. Should there be a spill during fueling, or if the generators have a slow leak, contamination of the soil could occur. However, best management practices and standard operating procedures would be implemented to reduce the likelihood of spills. Additionally, regular inspections and maintenance would be conducted to ensure the generators are functioning properly thereby reducing the potential for contamination from hazardous substances.

4.11.2.1 Mitigation

When removing the substrate and grading the soil of the indoor riding arena, the doors of the barn would remain open and personnel whose duties necessitate being in the barn should wear appropriately rated dust masks to prevent irritation from the Diesel Range Organics (DRO) in the substrate and soil. Any other safety precautions mandated by the contractor conducting the work should be followed by those onsite.

Testing of the soil should occur every three to five years to determine that levels have either stabilized or are decreasing. If levels rise about 100 mg/kg (twice the residential limit), management needs to start planning when to strip and re-soil the barn floor. If levels rise above 250 mg/kg (half of the industrial limit), management needs to plan for stripping and re-soiling the barn floor. If three tests occur showing either no change, or levels are decreasing, sampling can stop (B. Kennedy, personal communication, January 22, 2015).

Generators temporarily placed for utilization at the outdoor riding arena and temporary stalls would be maintained to prevent spilling of fuel onto the ground by either placing them on a mat or within a containment shelf or structure. During fueling, a drip pan would be utilized to contain spills.

4.11.3 Alternative Two

Impacts and mitigation measures would be the same as described for the Proposed Action.

4.12 FORESEEABLE ACTIONS AND CUMULATIVE IMPACTS

CEQ regulations stipulate that the cumulative effects analysis within an EA should 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 SEA, the affected area includes the decision area and Meadowood SRMA.

4.12.1 Recently Completed, Ongoing and Reasonably Foreseeable Actions

There are no projects with the potential to interact with the proposed Meadowood SRMA barn improvements that could result in cumulative impacts. Recently completed, ongoing, and future activities at Meadowood SRMA include a research study of erosion on Thompson Creek, acquisition of additional parcels, ongoing maintenance in various areas on the property, and a wild horse and burro adoption.

4.12.2 Potential Cumulative Impacts

The proposed improvements at Meadowood SRMA would be accomplished over an approximately 6-month time period. The Proposed Action and alternatives may cause minor inconveniences to equestrian activities and for recreational users, but these activities would continue during the six-month construction period and not differ from past activities at the Meadowood SRMA. There are no potential cumulative impacts associated with the proposed construction activities because the past, ongoing, and reasonably foreseeable projects mentioned above in Section 4.12.1 are temporally and spatially separate from the Proposed Action and alternatives and are not expected to cumulatively affect the decision area.

4.13 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF NATURAL AND DEPLETABLE RESOURCES

NEPA requires that environmental analysis include identification of "...any irreversible and irretrievable commitments of resources which would be involved in the Proposed Action should it be implemented." Irreversible and irretrievable resource commitments are related to the use of non-renewable resources and the effects that the uses of these resources have on future generations. Irreversible effects primarily result from the use or destruction of a specific resource (e.g., energy or minerals) that cannot be replaced within a reasonable time frame. Irretrievable resource commitments involve the loss in value of an affected resource that cannot be restored as a result of the action (e.g., the disturbance of a cultural site).

Most impacts are short-term during the periods of construction activities. Implementation of this action would result in a minor increase in fuels used by ground-based vehicles, particularly during the construction activities, and the materials used in construction. Therefore, minor amounts of these nonrenewable resources would be irretrievably lost or depleted.

4.14 RELATIONSHIP BETWEEN LOCAL SHORT-TERM USE ON THE ENVIRONMENT AND MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

NEPA requires an analysis of the relationship between a project's short-term impacts on the environment and of the effects that these impacts may have on the maintenance and enhancement of the long-term productivity of the affected environment. Impacts that narrow the range of beneficial uses of the environment are of particular concern. This refers to the possibility that choosing one development option reduces future flexibility in pursuing other options, or that giving over a parcel of land or other resource to a certain use eliminates the possibility of other uses being performed at the site.

The Proposed Action would take place within an existing barn footprint and areas that are already heavily grazed and disturbed. No unique habitat or ecosystems would be lost due to this action. Implementation of the Preferred Alternative would not result in any impacts that would reduce environmental productivity, permanently narrow the range of beneficial uses of the environment, or pose long-term risks to health, safety, or the general welfare of the public.

5.0 PERSONS, GROUPS, AND AGENCIES CONSULTED

CONSULTATION AND COORDINATION

List of Persons, Agencies and Organizations Consulted

Name	Purpose & Authorities for Consultation or Coordination	Findings & Conclusions
Fairfax County Department of Public Works and Environmental Services (DPWES)	Barn/arena structural assessment	Report findings available on Meadowood website: http://www.blm.gov/es/st/en/prog/recreation.html
Virginia Department of Conservation and Recreation (VDCR)	Construction jurisdiction for State of Virginia	Provided construction requirements information
Virginia Department of Historic Resources (VADHR)	Cultural resources consultation	VADHR concurred with the BLM's findings by letter on June 17th, 2015, that there will be no adverse effects to historic properties for the proposed project. The VADHR also requests that all employees or contractors be trained prior to beginning work on the identification of archeological resources. Upon finding any archeological remains, work will be halted at that location and the contractors will contact the BLM or other archeologist assigned to the project for further evaluation.
Virginia Department of Game and Inland Fisheries (VDGIF)	Threatened and Endangered Species	136 T&E species in Virginia, none in the decision area
U.S. Fish and Wildlife Service (FWS) Virginia Field Office	Sect. 7 consultation	Based upon a project review submitted to the FWS Virginia Field Office, potential impacts to the northern long-eared bat (threatened), dwarf wedgemussel (endangered), and small whorled pogonia (threatened) were examined. The bat would be impacted only by tree clearing, which is not part of the proposed action or alternatives. The pogonia could potentially be impacted by driving equipment in a wooded area, but surveys from the past several years have not revealed this species at Meadowood SRMA. The mussel lives in streams, which will not be impacted by the proposed action or alternatives. BLM determined that the proposed action or alternatives are unlikely to affect these species and no further consultation is required with the FWS Virginia Field Office.
Bureau of Land Management National Operations Center (NOC)	Stable/Arena Replacement Evaluation	Report findings available on Meadowood website: http://www.blm.gov/es/st/en/prog/recreation.html

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8.0 FIGURES

Meadowood Barn Photos

Figure 1. Aisle between stalls and tack storage



Figure 2. Main indoor arena



Figure 3. Exterior view of barn



Figure 4. Windowless stall



