National Park Service US Department of the Interior

Mammoth Cave National Park Kentucky



Construct Family Cabins and Improve Site Access Environmental Assessment/Assessment of Effect

August 2019







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US Department of the Interior National Park Service Mammoth Cave National Park

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Mammoth Cave National Park (the park) comprises 52,830 acres in Edmonson, Hart, and Barren Counties in the Commonwealth of Kentucky, approximately 100 miles northeast of Nashville, Tennessee and approximately 100 miles south of Louisville, Kentucky. The park is best known for preserving Mammoth Cave, currently the longest known cave system in the world, with more than 400 miles of surveyed cave passages.

Lodging at the park is concession-operated, and there are currently very limited to no lodging options available for larger families or for group gatherings such as family reunions, depending upon seasonal weather and planned closures. Additionally, the existing parking lot has deferred maintenance issues such as large potholes and crumbling edges. The current circulation patterns and configuration of the Lodge at Mammoth Cave (the lodge) parking area and access road are not intuitive and provide no sense of arrival. The National Park Service (NPS) is proposing to construct a series of cabins that can accommodate these larger families and groups as well as reconfigure the access road and parking area to address ongoing deferred maintenance, provide more intuitive wayfinding, and reestablish the cultural landscape.

This environmental assessment/assessment of effect (EA/AOE) evaluates two alternatives: a no-action alternative and the proposed action. The no-action alternative would continue the current management of the project area and lodging operations. The proposed action would include the consolidation of parking for the lodge to the west, relocation of the access road, reestablishment of open greenspace with trees, and the construction of a series of family cabins. Both alternatives have the potential to result in a combination of beneficial and adverse impacts on Cultural Landscapes and Visitor Use and Experience.

Note to Reviewers and Respondents:

This EA/AOE will be on formal public and agency review for 30 days from the release date. If you wish to comment, please provide comments on the park's website at http://parkplanning.nps.gov/maca or by mailing to the name and address below. Before including your address, phone number, email address, or other personal identifying information in your comment, you should be aware that your entire comment, including your personal identifying information, may be made publicly available at any time. While you can ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so.

Barclay C. Trimble Mammoth Cave National Park Attn: Family Cabins and Site Access EA/AOE P.O. Box 7 Mammoth Cave, KY 42259-0007 This page intentionally left blank.

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CHAPTER 1: PURPOSE AND NEED

INTRODUCTION

Mammoth Cave National Park (the park) comprises 52,830 acres in Edmonson, Hart, and Barren Counties in the Commonwealth of Kentucky, approximately 100 miles northeast of Nashville, Tennessee and approximately 100 miles south of Louisville, Kentucky (figure 1). The park is best known for preserving Mammoth Cave, currently the longest known cave system in the world, with more than 400 miles of surveyed cave passages.

Lodging at the park is concession-operated and is currently limited to four options: the Woodland Cottages, the Hotel Cottages, the Sunset Terrace Lodge, and the accessible Heritage Trail Rooms in the Lodge at Mammoth Cave (the lodge). While the Woodland Cottages consist of one four-bedroom unit, one three-bedroom unit, fifteen two-bedroom units, and four one-bedroom units, all are configured with only bedrooms and bathrooms with no common areas or kitchens. Each of the other lodging options provide single bedrooms that can accommodate between two and four guests. The park currently has very limited to no lodging options available for larger families or for group gatherings such as family reunions. Additionally, the existing parking lot has deferred maintenance issues such as large potholes and crumbling edges. The current circulation patterns and configuration of the hotel parking area and access road are not intuitive and provide no sense of arrival. The National Park Service (NPS) is proposing to construct a series of cabins that can accommodate these larger families and groups and to reconfigure the access road and parking area for more intuitive wayfinding while also addressing many deferred maintenance issues.

This environmental assessment/assessment of effect (EA/AOE) evaluates two alternatives: a no-action alternative and the proposed action. The proposed action includes constructing up to eight cabin units adjacent to the Lodge at Mammoth Cave and a reconfigured parking lot and access road. This EA/AOE analyzes the potential impacts these alternatives would have on natural and cultural resources as well as the human environment. It has been prepared in accordance with the National Environmental Policy Act of 1969 (NEPA), as amended (42 United States Code [USC] 4332[2] [C]); the implementing regulations of the Council on Environmental Quality (CEQ) (40 Code of Federal Regulations [CFR] 1500-1508.9); the Department of the Interior NEPA regulations (43 CFR Part 46); and NPS Director's Order #12: *Conservation Planning, Environmental Impact Analysis and Decision-Making* (NPS 2011) and the accompanying NEPA Handbook (NPS 2015b). This document was also prepared to satisfy the requirements of Section 106 of the National Historic Preservation Act of 1966 (NHPA), as amended (36 CFR Part 800) and includes an assessment of effect on historic properties.

PURPOSE OF AND NEED FOR ACTION

Purpose

The purpose of this project is to provide a concession-operated lodging option that can accommodate larger families or gatherings such as family reunions, as well as to address many deferred maintenance issues, improve ongoing safety concerns, provide parking, and provide intuitive circulation routes to the lodge parking area that create a sense of arrival, reestablish and improve the cultural landscape, reduce congestion, increase the number of parking spaces, and improve visitor interaction.

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FIGURE 1 Project Vicinity

Need

The project is needed because the park currently has very limited lodging options that can accommodate larger families (more than 4), multi-generational travel, or gatherings such as family reunions, depending upon seasonal weather and planned closures. Currently, only four concession-operated lodging options are offered at the park: The Woodland Cottages, the Hotel Cottages, the Sunset Terrace Lodge, and the accessible Heritage Trail Rooms in the Lodge at Mammoth Cave. These options are limited and cannot accommodate larger parties year-round. Additionally, accommodations for larger families or gatherings are very limited in the local community outside of the park.

This project is also needed because the current parking lot has substantial deferred maintenance and the configuration of the entrance road and lodge parking area provides no sense of arrival or an appropriate setting for the lodge. Current circulation routes are not intuitive to the visitor upon arrival. The historic character of the landscape has been altered over time and the paved parking lot south of the lodge has replaced the original open green space. These alterations have eliminated any visual continuity for the visitor to the cultural and historic landscape setting associated with the former 1925 hotel south of the parking lot, which was razed in 1979. Additionally, the current approach to the lodge is visually dominated by the service area of the lodge. The lodge entrance is visually lost, and the existing parking areas do not relate well to the entrance. Finally, the site does not meet current accessibility standards, and there are issues related to pedestrian connectivity to the lodge and surrounding areas, which create ongoing safety concerns. Connectivity issues include circulation paths that cross through sections of the existing parking lot to return to the main lodge lobby and a confusing entrance to the lodge from the park entrance road.

PROJECT AREA

As shown on figure 2, the proposed action would be designed within the developed area surrounding the existing lodge and its support facilities. This area consists of the visitor parking lot adjacent to the Lodge at Mammoth Cave, the existing dilapidated tennis and shuffleboard courts, the open lawn where the Heritage Trail wing rooms previously stood, and all green spaces, sidewalks, landscaping, and roads in between these facilities. The parking lot south of the lodge offers approximately 190 lined parking spaces in two distinct sections and is used daily by visitors seeking the concession facilities and the visitor center. During the busier summer months when demand exceeds all existing paved parking, visitors are directed to park in lawn areas and along road shoulders. The project area is bounded to the east by Mammoth Cave Entrance Road, to the north by the Lodge at Mammoth Cave, extending west to the natural enclosure of the oakhickory forest, and southward by the open green space in front of the Hotel Cottages.

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FIGURE 2 Project Area

ISSUES AND IMPACT TOPICS

Issues

During the scoping process, specific considerations and concerns were identified as critical to this project area. Along with the purpose of and need for the proposed action, these topics guided the development of alternatives and contributed to the selection of impact topics, as identified in the next section.

The project area includes a cultural landscape. The project area includes a portion of the core visitor services area of the park, which includes layers of important cultural landscapes, some of which precede the development of the national park. Implementing the proposed action would introduce new structures, would remove historic tennis courts and shuffleboard courts, and alter the existing circulation patterns. The proposed action would also reintroduce open greenspace and remove a non-historic parking lot south of the lodge. These actions have the potential to change the spatial organization, views, appearance, and the integrity of setting and feeling.

The parking lot has deferred maintenance issues. The existing parking lot south of the lodge has many deferred maintenance issues including cracks in the pavement, large potholes, and crumbling of pavement along the edges of the parking lot. Additionally, the striping and arrows painted on the pavement through the parking lot is faded, which may make it more difficult for visitors to follow. In addition to the issues related to condition of the pavement, accessibility of the parking lot and walkways does not meet current accessibility standards. While the existing accessible parking spaces and walkways are generally accessible, they were constructed prior to changes in regulation of the Architectural Barriers Act Accessibility Standard.

Overall wayfinding and orientation through the access road and parking area is not

intuitive. The current configuration of the access road and parking lot does not provide intuitive wayfinding and can be confusing to visitors. When approaching the lodge from the park entrance road, the initial view the visitor has is of a large service area. The main entrance of the lodge is not the dominant view and does not provide a sense of arrival. The park entrance, including the access road and the parking lot, offers several confusing decision points when approaching the lodge, and the expected circulation pattern is not intuitive. Visitors must rely on striping and arrows to navigate through the parking lot.

Lodging options are currently limited and unable to accommodate large groups. The park offers several options for visitor lodging, but only two Woodland Cottages are large enough to accommodate large families or groups (up to 6 people) and are open depending upon seasonal weather and planned closures. The park's current lodging concessioner has reported that they get numerous requests for these types of accommodations, which they are currently unable to provide. Lodging options for these families and groups is also limited in the nearby communities outside of the park.

Impact Topics Analyzed in this Environmental Assessment/Assessment of Effect

Impact topics are resources within the project area that could be affected, either beneficially or adversely, by the range of alternatives presented in this EA/AOE. Impact topics considered in this document were identified based on the issues raised during scoping, site conditions, federal laws, regulations, Executive Orders, NPS *Management Policies 2006*, Director's Orders, and staff knowledge of the park's resources. This section provides an overview of the impact topics that were retained for analysis in this EA/AOE.

Cultural Landscapes. NEPA, NHPA, the NPS Organic Act, NPS Management Policies 2006, Director's Order #12, and Director's Order #28: *Cultural Resource Management Guideline* require the consideration of impacts on any cultural resource that might be affected by a proposed federal action. The park is listed as a United Nations Educational, Scientific, and Cultural Organization (UNESCO) World Heritage site and features a documented cultural landscape. Contributing resources of the cultural landscape encompass the buildings, circulation systems, spatial organization, vegetation, land uses and activities, views, and small-scale features which date mainly to the 1930s through the 1970s. The Lodge at Mammoth Cave has undergone many alterations and is not considered historic; however, its contributing views and related circulation systems contribute to the cultural landscape. The proposed action has the potential to result in changes to these resources, including the addition of new structures into the cultural landscape, the removal of historic shuffleboard and tennis courts, and the removal of some vegetation. Therefore, the impact topic of cultural landscapes was retained for detailed analysis.

Visitor Use and Experience. Recreation related to and enjoyment of park resources and values by the people of the United States is part of the fundamental purpose of all parks (NPS 2006). The NPS strives to provide opportunities for forms of enjoyment that are uniquely suited and appropriate to the natural and cultural resources found in parks. One of the Fundamental Resources and Values of the park, according to the park's Foundation Document, is the opportunity for connection to the resources (NPS 2014). At the park, visitors enjoy a range of recreational opportunities including hiking, biking, equestrian use, and river activities including paddle sports and fishing. The proposed action is meant to uphold the park's tradition of hospitality and enhancing the visitor experience, which includes safety in and around the lodging facilities. The visitor experience at the park could be enhanced through the addition of family cabins and site access improvements. By providing lodging options that can accommodate larger groups, the park can allow for more visitors to engage with and enjoy park resources. Furthermore, reconfiguring the parking lot would improve access to the lodge, open up more green space for recreating, improve pedestrian connectivity, and accommodate more vehicles in the parking lot during peak summer months. Therefore, the impact topic of visitor use and experience was retained for detailed analysis.

Impact Topics Dismissed from Further Analysis

The following presents an overview of impact topics that were considered but ultimately dismissed from further analysis in this EA/AOE. An impact topic was initially considered but dismissed from further analysis if it was determined that the resource is not present in the project area or because any potential impacts would be less than minor, typically temporary, and localized.

Special Status Species. The project area is within range of three special status bat species: the Gray Bat (*Myotis grisescens*), the Indiana Bat (*Myotis sodalis*), and the Northern Long-Eared Bat (*Myotis septentrionalis*). The project area is within the vicinity of known hibernaculum, and these species are known to use nearby trees to roost during select times of the year. Mitigation measures would be in place to avoid impacts on these species, including restrictions on removing occupied bat roost trees to avoid disturbance during the roost season. Additionally, the NPS would complete consultation with the US Fish and Wildlife Service prior to taking action. Therefore, the impact topic of special status species was considered but dismissed from further analysis.

Archeological Resources. Because some ground disturbance would be required for improvements included with the proposed action, archeological resources were considered. Some areas have been

previously surveyed, and no significant resources were identified. In August 2018, a qualified archeological technician from the NPS Southeast Archeological Center conducted an archeological assessment within the project area. During this assessment, cultural materials were uncovered in several shovel test sites; however, no significant cultural resources were located, and no new sites were recorded. Additionally, it was noted in the assessment that the soils within these areas have been disturbed by prior development activities. Therefore, the assessment concluded that no significant intact archeological deposits are likely to be encountered or affected by this project (NPS 2018).

Outside of the 2018 survey area, NPS archeologists have researched and identified the location of the 1925 Mammoth Cave Hotel footprint. The hotel was razed in 1979 and, following removal of the majority of building materials, the site was filled with remaining materials and soil. The graded surface has been repurposed as lawn space and re-integrated as a part of the cultural landscape for the past 40 years. Surface observations and limited shovel tests have confirmed the presence of building debris in the footprint area, but previously utilized methods (i.e. hand excavation) have been unable to remove the demolished materials to the full breadth and depth of this remaining feature. The surface observations have determined that these materials are out of the original structural context and offer no new information regarding the design and/or function of this resource that was well documented, architecturally. The proposed action has the potential to result in changes to this resource, and archeological monitoring will confirm the lack of *in situ* (in the original place of deposition) archeological resources.

If during construction, previously unknown archeological resources are discovered, all work in the immediate vicinity of the discovery would be halted until the resources could be identified and documented and, if significant resources could not be preserved *in situ*, an appropriate mitigation strategy (e.g., the excavation, recordation, and mapping of cultural remains prior to disturbance to ensure the recovery of archeological data that otherwise would be lost) would be developed in consultation with the State Historic Preservation Office (SHPO) and, as appropriate, associated American Indian tribes. The NPS will utilize an archeological monitor during ground disturbing activities to mitigate the potential for adverse impacts. Mitigation measures have been put in place that will minimize impacts; therefore, the impact topic of archeological resources was considered but dismissed from further analysis in this environmental assessment. If archeological monitoring identifies significant resources during construction, further analysis of impacts may be needed and would be conducted under a future compliance effort.

Water Quality. Although there is the potential for construction activities and runoff from the proposed parking lot to affect water quality, the NPS is proposing a new storm water filter that would increase the overall stormwater capacity of the site. Standard erosion and sediment mitigation measures would be in place to mitigate potential adverse impacts related to construction activities. Additionally, due to removal of existing impervious surfaces (including the tennis courts), consolidation of the parking lot, and creation of new greenspace, there would be no net increase in overall impervious surfaces related to the parking lot and the access road within the project site. Therefore, the impact topic of water quality was considered but dismissed from further analysis.

Dark Skies. Nighttime views and environments are among the critical park features protected by the NPS. The NPS is applying for International Dark Sky Park status for the park through the International Dark-Sky Association, an NPS partner that sets responsible lighting standards. Although some lighting would be added for the new parking lot and family cabins, those lights would be dark-sky compliant and

would not adversely affect the overall dark sky status. Therefore, the impact topic of dark skies was considered but dismissed from further analysis.

Wetlands. A wetland delineation was conducted by a qualified wetlands professional in October 2018 to determine if any jurisdictional wetlands exist within the project area. The delineation determined that a Palustrine Emergent (PEM) wetland approximately 0.038 acres in size is located near the western boundary of the project area. However, the proposed action would avoid any impacts on that wetland, and no ground disturbance would occur within the immediate vicinity. See Appendix A: Wetland Technical Report for additional information. Therefore, the impact topic of wetlands was considered but dismissed from further analysis.

CHAPTER 2: ALTERNATIVES

This chapter describes actions that would take place under each alternative for family cabin construction and site access improvements at the park. CEQ regulations for implementation of the NEPA process call for the alternatives considered in a document to include a no-action alternative. The description and evaluation of this alternative provides a baseline to which the action alternatives can be compared. This EA/AOE evaluates two alternatives: the no-action and the proposed action. The elements of these alternatives are described in the following sections. Impacts associated with the alternatives are described in "Chapter 3: Affected Environment and Environmental Consequences."

NO-ACTION ALTERNATIVE

Under the no-action alternative, existing lodging operations would continue under the current conditions using the existing infrastructure, and no family cabins would be constructed. See figure 3 for a site plan of the existing conditions. The existing four concession-operated lodging options would remain the only lodging options outside of campgrounds within the park boundaries: the Woodland Cottages, the Hotel Cottages, the Sunset Terrace Lodge, and accessible rooms in the Lodge at Mammoth Cave. The park has very limited existing options that are large enough to accommodate large families or groups.

The parking layout at the lodge would remain centered in front of the lodge entrance under the noaction alternative, and current site deficiencies would persist. There would continue to be no sense of arrival as visitors approach the lodge and immediately view the service area. Vehicular access to the lodge would remain unintuitive and the site would continue to not fully meet current accessibility requirements. Additionally, ongoing safety concerns, such as pedestrians crossing the main entrance road, would continue.

The existing access road would remain in its current configuration with the bus drop-off and service area prominently displayed within guests' viewshed as they approach the lodge. The existing parking lot would continue to offer approximately 190 lined parking spaces and serve both visitors seeking the visitor center and the concession facilities. During the busy summer months, the park would continue to direct



visitors to park in lawn areas and along road shoulders when demand exceeds the existing paved parking areas provided. The dilapidated tennis courts and shuffleboard courts to the south of the parking lot would remain in place.

Existing parking lot with the Lodge at Mammoth Cave in background

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> FIGURE 3 No-Action Alternative: Site Plan

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PROPOSED ACTION / NPS PREFERRED ALTERNATIVE

The proposed action would accommodate lodging for larger groups and implement site access improvements by constructing family cabins and reconfiguring the parking lot and access road. Proposed improvements are detailed below and are shown in figures 4 and 5.

The proposed family cabins would be constructed adjacent to the Lodge at Mammoth Cave in the existing open grassy area to the west. This alternative plans for up to eight family cabin units which could be constructed in a phased approach. The cabins could consist of a combination of duplexes and single cabins to provide a lodging option for larger groups. Each cabin would be able to sleep eight to ten guests and would include the following:

- i two bedrooms
- i a kitchen/dining area
- i at least one bathroom
- i a living room
- i a loft
- an eight-foot-wide covered porch between the cabins and in front of the duplex

The duplex style cabins would be constructed side-by-side with a common roof over each cabin duplex. The overall dimension for each of the family cabin duplexes would be approximately 64 feet by 38 feet. The single cabins would have a similar overall footprint as one half of the duplex style.

The proposed action would also consist of consolidating the parking from the front of the lodge to the west to create a contiguous green space and natural character setting for the lodge. The NPS would relocate the access road away from the front of the lodge to improve ongoing safety concerns, reduce congestion, improve the view of the lodge and visitor center from the access road, and improve the viewshed from the lodge. The relocated road would also provide more intuitive wayfinding to the lodge, proposed family cabins, and reconfigured parking lot. A new bus and service road would be constructed to the east of the lodge to separate bus and delivery traffic from visitor traffic. The existing parking lot in front (south) of the lodge would be converted into green space, and new pedestrian connections would be added between the lodge, new parking lot, and existing pedestrian walkways. This would be undertaken to reduce or eliminate current pedestrian/vehicle conflicts. All proposed pedestrian circulation routes would comply with current accessibility standards. Trees would be planted throughout the project area to complement the cultural landscape. A bus drop-off and bus shelter would be constructed near the front entrance of the lodge, which would allow through traffic to bypass these larger vehicles and easily access the parking area. The reconfigured parking lot would provide for a one-way circulation loop in order to improve vehicle flow and provide an intuitive circulation pattern. The parking lot improvements under the proposed action would increase the capacity of the parking area to 260 vehicles. This parking lot would include parking for the new family cabins along the northern edge of the parking lot. An overflow parking lot would be constructed on the opposite side of the access road along the southern edge of the proposed parking lot. The existing shuffleboard and tennis courts would be removed to accommodate the larger parking lot and overflow lot. Additionally, tree removal within an approximately 2-acre area would be required to the northeast, south, and west of the tennis courts. Most of this area is lawn interspersed with mature trees, though a small, approximately 0.25-acre area of more dense vegetation would be removed to the west of the tennis courts.

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> FIGURE 4 Proposed Action: Site Plan



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MITIGATION MEASURES OF THE ACTION ALTERNATIVE

To minimize environmental impacts related to the action alternative, the NPS would implement mitigation measures whenever feasible. Exact mitigation measures to be implemented would depend upon the final design and approval of plans by relevant agencies and would be determined during future design and construction phases. The following is a list of actions that could take place:

- Instruct all contractor employees on the sensitivity of the general environment and monitor their activities by NPS staff in order to mitigate and minimize potential impacts on natural and cultural resources during construction. Corridors for construction vehicle movement would be established and defined on the ground. Staging of construction equipment would be restricted to the road corridor, parking lots, and other identified previously disturbed areas to avoid impacts on natural and cultural resources.
- i Clearly state all protection measures in the construction specifications and instruct workers to avoid conducting activities beyond the fenced construction zone.
- Fence all areas in order to keep related disturbances within an NPS-defined and minimal impact area required for construction.
- i Implement standard noise abatement measures during construction. Standard noise abatement measures could include the following elements: a schedule that minimizes impacts on adjacent noise-sensitive uses, the use of the best available noise control techniques wherever feasible, the use of hydraulically or electrically powered impact tools when feasible, and location of temporary noise sources as far from sensitive uses as possible.
- Minimize soil erosion by limiting the time that soil is left exposed and by applying other erosion control measures, such as erosion matting and silt fencing in construction areas to reduce erosion, surface scouring, and discharge to water bodies.
- i Remove invasive plants from construction areas using approaches prescribed in the NPS Integrated Pest Management Program.
- i Implement measures to prevent invasive plants from returning to sites where they have been removed, such as ensuring that construction-related equipment arrives at the site free of mud or seed-bearing materials and certifying that all seeds and straw material are weed-free.
- Rehabilitate areas that are disturbed, either during construction or areas that were previously disturbed, with NPS-approved vegetation, as per NPS standards and consistent with the cultural landscape report.
- Immediately implement NHPA Section 106 procedures if any unknown significant archeological resources are uncovered during ground-disturbing activities. If previously unknown archeological resources are discovered during construction, all work in the immediate vicinity of the discovery shall be halted until the resources are identified and documented and an appropriate mitigation strategy developed, if necessary, in accordance with pertinent laws and regulations, including the stipulations of the 2008 Programmatic Agreement Among the NPS (US Department of the Interior), the Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers.
- Tree removal would not take place during the bat roosting season from April 1–October 15. If it is determined that a tree needs to be removed during this time, the park's Science and Resources Management Division will be consulted prior to taking action.

ALTERNATIVES CONSIDERED BUT DISMISSED

Alternative elements were identified during the concept development and internal scoping processes. Some of these were determined to be unreasonable or much less desirable than similar options included in the analysis and were therefore not carried forward for analysis in this EA/AOE. The descriptions below summarize the alternative options that were considered but dismissed from further analysis and the rationale behind the dismissal.

Other Parking Lot and Access Road Configurations

Several configurations of the parking lot and access road were considered during the planning process, including the following:

- Eliminate vehicular connections to the service area but maintain a portion of the access road location in front of the lodge.
- Reconfigure the parking area but retain its location in front of (south of) the lodge to maintain two distinct parking areas.

These other parking lot and access road configurations were dismissed because they did not correct the ongoing safety concerns, reestablish the cultural landscape, provide screening for the service area, or provide intuitive wayfinding and circulation as well as the proposed action.

Other Family Cabin Sites

Several other locations for the family cabins were considered during the planning process, including the following:

- North of the visitor center, in the picnic area adjacent to the Woodland Cottages
- North of the visitor center, in the lower picnic area west of the Woodland Cottages
- West of the existing parking lot, in the wooded area north of the Sunset Terrace Lodge
- South of the existing parking lot, adjacent to the Hotel Cottages

The locations north of the visitor center in the lower picnic area and adjacent to the Woodland Cottages were dismissed because there is not sufficient parking to serve the new cabins and there are currently no utilities adjacent to the proposed building sites at these locations. Bringing utilities to these areas would substantially increase the cost of the project, resulting in an alternative that would not be feasible to implement.

The location in the wooded area north of the Sunset Terrace Lodge was dismissed because of its proximity to sensitive archeological resources. Implementation of this alternative would have resulted in unacceptable impacts on these resources that would be avoided by implementing other alternatives.

The location south of the lodge adjacent to the Hotel Cottages was dismissed because it was determined that the new cabins would have an unacceptable visual impact on the adjacent Hotel Cottages. The Hotel Cottages are contributing resources to the cultural landscape and their setting of the semi-circular siting of the cottages with open lawn in front and dense woodland vegetation behind them is considered an important smaller landscape. Placing new cabins within this area would substantially alter the views, feeling, and spatial patterns of a smaller landscape that is relatively intact. Implementation of this alternative would have resulted in adverse impacts that would be avoided by implementing other alternatives.

CHAPTER 3: AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This chapter describes the current environmental conditions in and surrounding the project as they relate to each impact topic retained for analysis, as outlined in chapter 1. These conditions serve as a baseline for understanding the resources that could be impacted by implementing the project. This chapter then analyzes the beneficial and adverse impacts that would result from implementing any of the alternatives considered in this EA/AOE.

GENERAL METHODOLOGY FOR ANALYZING IMPACTS

In accordance with the CEQ regulations for implementation of NEPA, direct, indirect, and cumulative impacts are described under each impact topic (40 CFR 1502.16), and the impacts are assessed in terms of context and intensity (40 CFR 1508.27). Where appropriate, mitigating measures for adverse impacts are also described and incorporated into the evaluation of impacts. The specific methods used to assess impacts for each resource may vary; therefore, these methodologies are described under each impact topic.

Cumulative Impacts Analysis Methodology

Cumulative impacts are defined as "the impact on the environment which results from the incremental impact of the action when added to other past, present, or reasonably foreseeable future actions regardless of what agency (federal or nonfederal) or person undertakes such other actions" (40 CFR 1508.7). Cumulative impacts were determined for each impact topic by combining the impacts of the alternative being analyzed and other past, present, and reasonably foreseeable future actions that would also result in beneficial or adverse impacts. Several actions were identified through the project scoping process and are summarized below.

Past, Present, and Reasonably Foreseeable Future Actions

Hotel Roof and Exterior. The National Park Service is planning to repair leaks and improve the general appearance of the Lodge at Mammoth Cave roof. The current flat roof has chronic leak problems and there is no insulation in the roof, walls, or windows of the lodge building. Further, the architectural character of the Lodge at Mammoth Cave does not match the character of the park's visitor center. Renovation of the roof and exterior walls is needed to address these issues. This action has the potential to affect resources included under the impact topics of "cultural landscapes" and "visitor use and experience."

Woodland Cottages. The National Park Service is planning to install insulation and HVAC systems in the 20 Woodland Cottages. This action will help increase comfort in the cottages and will allow them to be used by visitors throughout the year, while still maintaining their historic character. This action has the potential to affect resources included under the impact topic of "visitor use and experience."

Hotel Cottages. The National Park Service is planning to improve electric service to the 10 Hotel Cottages, built in the 1930s. Some still have original fuses and "wire and post" electric systems while lacking electrical disconnects for each cottage and grounded outlets. This action will replace wiring with systems that conform to the National Electric Code. This action has the potential to affect resources included under the impact topic of "visitor use and experience."

Campground upgrades. The Mammoth Cave Campground currently has 2 RV sites and 110 tent sites (including group sites). This project could expand options to include many RV sites that would include electric, water, and possibly sewer hook-ups, roughly the same amount of tent sites, group sites, and possibly sites that could incorporate tents on platforms. There could also be a major rehabilitation of the campground store, and the restrooms in the campground loops could be expanded to include showers. This action has the potential to affect resources included under the impact topic of "visitor use and experience."

Heritage Trail Boardwalk. The NPS is planning to rehabilitate or rebuild the existing boardwalk along the Heritage Trail for improved visitor access. This boardwalk is located to the northwest of the Lodge at Mammoth Cave; the proposed family cabins would be located directly south of this section of trail. This action has the potential to affect resources included under the impact topic of "visitor use and experience."

Previous projects related to visitor experience. Other past projects have improved the visitor experience of the park, including Lodge at Mammoth Cave renovations, renovation of the Sunset Terrace Lodge, and replacement of walkways. Additionally, lodging rooms in the park were eliminated with the removal of the Heritage Wing of the Lodge at Mammoth Cave in 2015 due to a multitude of issues in which the cost to renovate exceed the cost benefit. These actions have the potential to affect resources included under the impact topic of "visitor use and experience."

CULTURAL LANDSCAPE

Affected Environment

The project area is part of a greater core visitor services landscape atop the broad ridgeline surrounding the Mammoth Cave Historic Entrance, which has been a popular tourist attraction since the early nineteenth century. The cultural landscape within the project area encompasses the buildings, circulation systems, spatial organization, vegetation, land uses and activities, views, and small-scale features which date mainly to the 1930s through the 1970s, although some features predate this period. The immediate setting of the project area lies on top of a ridge with gradually descending areas to the east and west. An overarching period of significance for the park is determined to be 1806-1941; however, most of the buildings, structures, much of the circulation system, and some of the existing vegetation in the project area date to two well-known federal building programs: the Civilian Conservation Corps (CCC) (1933-1942) and the Mission 66 program of the NPS (1956-1966) (NPS 2015a). The more recent buildings at Mammoth Cave, including the existing Lodge at Mammoth Cave and the Sunset Terrace Lodge units, were all built during the NPS's Mission 66 program. The Mission 66 program was a 10-year program instituted by the NPS in 1956 to improve visitors' experiences in national parks throughout the country. These improvements included updated road systems, employee housing, and visitor centers.

One of the character-defining features of the cultural landscape within the project area is the open landscape composed of broad grass lawn framed by groves and rows of cedar trees and mature deciduous shade trees south of the Lodge at Mammoth Cave and parking area. Some of the individual trees and the established spatial organization of the open space and tree massing retain high integrity to the period of significance for the area. Within the project area, the vegetation is primarily mowed lawn, established landscaping shrubs, and scattered trees. Herbaceous species and other hardwood species can be found throughout the project area. Woody vegetation surrounds the maintained lawns and landscaping and are typical of the species composition found in the natural forests of the park, including Kentucky bluegrass (*poa pratensis L.*), eastern red cedar (*Juniperus virginiana*), and American sycamore (*Platanus occidentalis*) (NPS 2013). Cedar tree groves were planted in association with the circa 1920 and 1930 arched entrance approach to the 1925 Mammoth Cave Hotel and grounds; several of these trees remain extant on the landscape today. Extant deciduous trees evident around the Hotel Cottages landscape appear on a 1937 site plan for this area (NPS 2015a).

Contributing structures of the cultural landscape include the tennis and shuffleboard courts to the southwest of the lodge, built by the CCC in the late 1930s, which are currently in dilapidated condition which make the courts unusable. The tennis courts are paved in asphalt and surrounded by a chain link fence. A portion of the fence is original to the early park development period, according to the cultural landscape report (NPS 2015a). In recent years, these courts have also served to play basketball but are otherwise used minimally, as reported by the NPS.

Pedestrian circulation within the project area includes pedestrian trails and boardwalks connecting the Lodge at Mammoth Cave, parking lot, visitor center, the Hotel Cottages, and other sites outside of the project area including the camp store and amphitheater. Most of these pedestrian walkways replaced earlier circulation routes through the project area and do not contribute to the cultural landscape. The exception is the alignment of the pedestrian walkways in the vicinity of the Hotel Cottages. Vehicular circulation within the cultural landscape includes an entrance road from Mammoth Cave Parkway to the lodge and parking area. At the west end of the parking lot, another road leads to the Sunset Terrace Lodge units and associated parking. A service road is located to the south of the lodge parking lot adjacent to the



Existing parking lot south of the Lodge at Mammoth Cave

tennis courts. All of the vehicular circulation routes through the project area have replaced earlier circulation patterns and are not considered contributing resources to the cultural landscape (NPS 2015a). Views within the project area have changed over the decades due to continued development in the core visitor services area. The large parking area has created a major disruption to visitor flow from the lodge to any facilities, site amenities, or trail systems in the surrounding area. It also has eliminated any visual continuity for the visitor to the cultural and historic landscape setting associated with the former 1925 hotel south of the parking lot. Today, views include the non-historic Lodge at Mammoth Cave and large paved parking areas. West of the parking lot, guests also have views of an open green space, which is where the Heritage Trail wing rooms once stood, and where the proposed family cabins would be constructed and the area revegetated. The access road to the lodge and visitor center is also a key part of visitors' viewsheds and offers first glimpses of the core visitor services area as guests approach; however, the view of the lodge service area dominates the view from the access road. Though most views of the project area have changed due to development, some remain from the period of significance. Contributing views within the project area include the views to the original hotel site and to the Hotel Cottages across the open landscape with extant mature vegetation, maintained lawn, and cedar groves. Additionally, mature vegetation surrounds the project area, which helps retain integrity to the period of significance for the area (NPS 2015a).

Methodology

Potential impacts on cultural resources are evaluated based on changes to character-defining features of the resources, which are the characteristics of a historic property that qualify the property for inclusion in the National Register. This approach is derived from the Secretary of the Interior's Standards for Treatment of Historic Properties, Director's Order #28: *Cultural Resource Management Guidelines*, as well as the regulations of the Advisory Council on Historic Preservation implementing the provisions of NHPA. Character-defining features contribute to a property's integrity, which is composed of location, design, setting, materials, workmanship, feeling, and/or association. Shaped through time by historical land-use and management practices, as well as politics and property laws, levels of technology, and economic conditions, cultural landscapes provide a living record of an area's past, as well as a visual chronicle of its history. The current conditions of cultural resources, as presented under the "Affected Environment" section above, were compared with the alternatives described in chapter 2 to determine the impacts on the historic structure and cultural landscapes.

This section analyzes impacts on the cultural landscape under NEPA; the analysis of effects on the cultural landscape in compliance with NHPA Section 106 is presented in the "Assessment of Effect on Historic Properties" section at the end of this chapter.

Impacts of No-Action Alternative

Under the no-action alternative, there would be no changes to the existing historic views, circulation patterns, the original tennis and shuffleboard courts, or cultural vegetation. The original viewshed offering first glimpses of the core visitor services area as guests approach from the historic entrance road would remain untouched; however, the parking lot and access road configuration would allow the bus drop-off and service area to continue to dominate the view upon arriving at the lodge. The bus drop-off is visually disruptive to the parking and pedestrian flow, and also poses accessibility and safety challenges. Guests would also continue to experience pedestrian connectivity and wayfinding challenges using non-intuitive circulation paths to the lodge and surrounding areas. Part of these circulation paths also include walking through sections of the existing parking lot to return to the main lodge lobby. The existing, non-historic

pedestrian and vehicular circulation patterns would remain, and the only contributing circulation patterns remaining would be the pedestrian walkways nearest to the Hotel Cottages. The historic tennis and shuffleboard courts would also remain in place under the no-action alternative. Extant cultural vegetation on the property would remain intact, including the established spatial organization of the original lawn, tree massings, and traditional vegetation. Under the no-action alternative, there would be no new structures added within the cultural landscape. Overall, the no-action alternative would allow existing circulation routes, viewsheds, vegetation, and structures to remain intact and would have no impact on the cultural landscape.

Impacts of Proposed Action / NPS Preferred Alternative

Under the proposed action, the cultural landscape would be altered by the removal of existing features and the addition of new features. The consolidation of the parking lot to the west of the lodge would result in the removal of existing hardscape in front of the lodge that is a non-contributing feature to the cultural landscape. Conversion of this area into greenspace would restore the open landscaped character of the cultural landscape that was lost due to development of the parking lot, which would be considered a beneficial impact on the cultural landscape. With the modifications to the parking lot configuration, the existing 1939 tennis and shuffleboard courts, which have not been maintained for many year and could be considered a visual nuisance, would be removed to make room for the expansion. The loss of these elements would be an adverse impact on contributing resources of the cultural landscape; however, these resources are small features of the overall cultural landscape and their loss would not diminish the overall historic character of the landscape. Similarly, although some mature trees to the west of the tennis courts would also be removed, the impact of the loss of vegetation would be relatively small when compared to the abundance of vegetation that would remain within and surrounding the project area. Furthermore, the NPS would plant new trees and vegetation in and around the expanded parking lot, including landscaped islands to restore the landscaped character.

The proposed changes to the pedestrian and vehicular circulation patterns through the relocation of the access road and new pedestrian trails would result in new circulation patterns in the landscape. However, the existing roads and trails that would be modified are not contributing features of the landscape and are not historic circulation routes. Changes to visitor circulation could lead to alterations in visitor experience of some elements of the cultural landscape. For example, visitors using the pedestrian trails would experience walking along trails with vegetated backdrops, and the visitors' first view of the lodge from the access road would no longer be of the service area. These changes would result in a beneficial impact on the cultural landscape.

The proposed action would result in beneficial impacts related to views within the cultural landscape. The area to the south of the lodge would be revegetated after removal of the parking lot, which would restore the historic views across the open landscape with maintained lawn and vegetation. Additionally, the remaining historic views to the original hotel site and to the Hotel Cottages would be unchanged.

Under the proposed action, the construction of family cabins adjacent to the Lodge at Mammoth Cave would result in the introduction of non-historic structures into the cultural landscape. However, these cabins would be designed to be compatible with the surrounding landscape and aesthetic of the existing buildings. Additionally, they would be only one-and-a-half stories in height and would be set in a previously developed area; therefore, they would not disrupt any intact historic views or vistas within the

project area. Although this alternative would introduce new structures, the cabins would not alter the land use patterns in the area because it has historically and continues to be used for visitor lodging. Similarly, given that this area was previously cleared and developed, this action would have no impact to vegetation in this area.

Overall, implementing site access improvements and constructing family cabins would have a beneficial impact on the cultural landscape. Although some historic features such as the tennis and shuffleboard courts, vegetation, and appearance would be altered or removed, the action would also restore historic elements and views to the cultural landscape.

Cumulative Impacts

Other past, present, or reasonably foreseeable actions that have or would contribute to the cumulative impacts on the cultural landscape include the Lodge at Mammoth Cave roof and exterior project. The lodge roof and exterior project proposes to repair leaks and improve the general appearance of the Lodge at Mammoth Cave. The project would also change the appearance of the lodge by creating an entrance plaza. Completing this project would result in a slight beneficial impact on the cultural landscape due to the modification in appearance of the lodge, which would be more compatible with the existing visitor center aesthetic and the landscape overall.

Under the no-action alternative, there would be no impacts on the cultural landscape. Although other past, present, and reasonably foreseeable actions may affect the area's cultural landscape, the no-action alternative would have no new impacts on the cultural landscape and therefore would not contribute to the impacts of other actions. Consequently, there would be no cumulative impacts on cultural landscapes under the no-action alternative.

Under the proposed action, there would be an overall beneficial impact on the cultural landscape due to the restoration of contributing features of the landscape's spatial organization, including open greenspace and vegetation patterns south of the lodge. When considered with the actions identified above, the overall beneficial impact of the proposed action would contribute to the slight beneficial impact of the lodge roof and exterior project. Therefore, the overall cumulative impact on the cultural landscape would be beneficial from the actions proposed under the proposed action.

Conclusion

There would be no impacts on the cultural landscape under the no-action alternative because there would be no changes to the project area. The proposed action would result in a combination of adverse and beneficial impacts due to the addition of non-historic elements, the removal of historic elements, and the restoration of open greenspace south of the lodge. Although the removal of the historic tennis and shuffleboard courts would remove contributing resources from the cultural landscape, they are a relatively small feature when considered with the overall contributing resources and character-defining features that would remain such as the spatial organization, land use, and vegetation. The loss of the tennis and shuffleboard courts would not alter the cultural landscape in a manner that would diminish the overall historic integrity of the site. Additionally, the removal of vegetation, while contributing to the feeling and aesthetic of the cultural landscape, would be relatively small when compared to the existing vegetation, particularly in the forested areas, that would remain. The proposed action would result in beneficial impacts on the cultural landscape by removing the non-historic parking area directly in front of the lodge and consolidating parking to the west. This would allow the NPS to reestablish historic vegetation and spatial patterns in this area by creating open lawns with future mature trees and pedestrian circulation paths. Although the pedestrian and vehicular circulation patterns under the proposed action would be new patterns, they would be compatible with the cultural landscape and would follow historic land use of the project area. Overall, the proposed action would allow the NPS to reestablish some of the lost integrity of the cultural landscape that resulted from continued development through the park's history.

VISITOR USE AND EXPERIENCE

Affected Environment

In 2018, an estimated 533,206 recreational visitors travelled to the park (NPS 2019b). Park visitation is heaviest during the summer. The primary focus of the project area is the core visitor services area of the park. Currently, the Lodge at Mammoth Cave is fully operational from March through October and offers more limited services from November through February. According to NPS data, during the busy summer months, existing lodging options are between 87 and 98 percent occupied on a nightly basis (NPS 2019a). The lodge is proximal to and provides convenient access to the Historic Entrance of Mammoth Cave and the visitor center (each approximately 300 feet away). The parking lot on the south side of the lodge offers approximately 190 lined parking spaces and serves both visitors seeking the visitor center and the concession facilities. Overnight visitors have various options for room accommodations. Four rooms are located within the lodge building and provide fully ADA-accessible accommodations. Twenty rooms are located in Sunset Terrace Lodge at the far western edge of the project area. Set back from the lodge, these rooms provide motel units in a quieter, forested area. Two of these rooms are ADA accessible. The Sunset Terrace Lodge has covered walkways and plazas with outdoor tables and chairs and a parking lot with space for 30 vehicles. The Lodge at Mammoth Cave is approximately 600 feet away. The Woodland Cottages are located to the north of the visitor center and include 20 units with one to four bedrooms in a forested area. These cottages currently lack heating or cooling and are only seasonally available. The final lodging option at the park are the Hotel Cottages; these consist of ten single cottages located in a private setting just south of the existing parking lot.

In addition to the lodging options for visitors, visitor use elements in the project area also include aging recreation facilities, including a dilapidated shuffleboard court and tennis courts, which were built in the late 1930s. These facilities are located to the southwest of the lodge and occasionally also serve as basketball courts but are otherwise rarely used by visitors.

Visitor experience in the parking lot area can be confusing. When visitors first pull off the Mammoth Cave Entrance Road onto the lodge



Existing tennis courts south of lodge parking lot

access road, they see a service area; this introduction to the site does not provide clear direction to the lodge entrance or other visitor areas. As visitors enter the project area, they also see a visual disconnect between the Lodge at Mammoth Cave and the visitor center, as the two buildings contrast greatly in design and materials (NPS 2013). This disconnect contributes to the lack of effective visitor orientation to the project area. It is apparent that existing parking areas were not designed at the time of the current lodge, as the lodge building relates poorly to both parking lots. This results in a series of awkward spaces and flow when experienced together by the visitor; flow is also hindered by lack of direction and any perceivable organization. Furthermore, the site does not fully meet current accessibility standards due to these issues related to pedestrian connectivity to the lodge and surrounding areas. Finally, the amount of parking currently available is inadequate during busy summer months. There are not enough parking spaces to accommodate all vehicles and visitors often park on roadsides.



View from access road towards Lodge at Mammoth Cave with service area in center and Visitor Center in background

Methodology

Potential impacts on visitor use and experience are assessed based on changes to the way people use the project area, as well as how the alternatives would alter visitors' experiences. Recreation related to and enjoyment of park resources and values by the people of the United States is part of the fundamental purpose of all parks (NPS 2006). The NPS strives to provide opportunities for forms of enjoyment that are uniquely suited and appropriate to the natural and cultural resources found in parks. The current conditions of visitor use and experience, as presented in the "Affected Environment" section above, were compared with the alternatives described in chapter 2 to determine how visitor use and experience would be affected.

Impacts of No-Action Alternative

Under the no-action alternative, existing lodging operations would continue under the current conditions, using the existing facilities and infrastructure. There would continue to be a scarcity of lodging options to accommodate larger groups of visitors, and the current lodging concessioner would not be able to meet demand from large groups. During the busy summer season, lodging occupancy rates are expected to continue at the current rates of between 87 and 98 percent. Lodging capacity would be restricted to the existing 20 Sunset Terrace Lodge rooms, the 4 accessible rooms in the Lodge at Mammoth Cave, the 20 Woodland Cottages, and the 10 Hotel Cottages.

Visitors would continue to use existing circulation paths and non-intuitive wayfinding for parking at the lodge, and access to the lodge would not be improved. The current approach would continue to be visually dominated by the lodge service area and existing parking areas would not orient well to the entrance. There would also continue to be accessibility issues, as the site does not meet current accessibility standards due to issues related to pedestrian connectivity to the lodge and surrounding areas. During the busier summer months when demand exceeds all existing paved parking, visitors would continue to park in lawn areas and along road shoulders, as there would not be enough parking spaces to accommodate all vehicles. Under the no-action alternative, the tennis and shuffleboard courts to the south of the existing parking lot would remain intact.

Overall, the no-action alternative would have a minor adverse impact on visitor use and experience in the park by continuing to provide a non-intuitive and confusing entrance to the lodge as well as by not providing lodging options that can accommodate large groups.

Impacts of Proposed Action / NPS Preferred Alternative

Under the proposed action, improved, supplemental accommodations would increase the overall lodging capacity at the park and would offer more options for large groups. This would have a beneficial impact on visitor use and experience by offering more lodging options that can accommodate large groups. According to the current lodging concessioner, larger groups have been turned away from staying overnight in the park because lodging options they were seeking are not available in the park (NPS 2019a). By responding to visitor demand in offering more lodging options, the proposed action may also have an indirect impact on visitation levels and visitor satisfaction at the park. The increase in overall lodging capacity and options for large groups may result in some overnight visitors feeling more crowded in park amenities if more people are using them at the same time. However, the increase in overnight guests would not increase the feeling of crowding during the day. The increase in the number of overnight guests would be relatively very small when compared to the high daytime visitation the park sees, particularly during the busiest season. During the busiest months (June through August), the park saw between 60,000 and 101,000 monthly visitors in 2018 (NPS 2019c). If the proposed family cabins were full each night during this season, assuming the cabins can sleep a maximum of 80 guests, the cabins would account for only approximately 2,400 monthly visitors to the park. Additionally, the proposed family cabins would be located on the site of the former Heritage Trail wing of the lodge, which was removed in 2015. The maximum capacity of the cabins would not exceed the maximum capacity of the Heritage Trail wing, which had 38 rooms. Therefore, the increase in overall lodging capacity is not expected to result in an increase in the feeling of crowding for visitors and is not expected to result in an adverse impact on visitor use and experience.

Under the proposed action, changes to circulation, the reconfiguration of the parking lot, the addition of green space, and the removal of the tennis and shuffleboard courts would change the way visitors experience the lodge environment. Through improved circulation routes in front of the lodge, visitors would encounter less congestion, ample parking space, and improved pedestrian connections to amenities on the property. All proposed pedestrian circulation routes would comply with current accessibility standards. Visitors would also have more direct access to green space once the parking lot is reconfigured. Furthermore, changes to routes in front of the lodge itself. These changes would improve the visitor center from the access road, as well as from the lodge itself. These changes would improve the visitor experience by providing more intuitive wayfinding via the access road to the lodge, the proposed family cabins, and the parking lot. The visitor would also experience better views throughout the area along this access road (see photograph and rendering comparison below). The proposed action would also entail removing the tennis and shuffleboard courts in order to make room for the reconfigured parking lot. While this may reduce visitors' recreational opportunities, the courts are minimally used and the site access improvements and cabin construction would generally improve visitors' use of the facilities.

Constructing the new cabins and reconfiguring the parking lot would result in temporary construction impacts, including partial or full closure of the existing parking lot, construction noise, and construction equipment and materials within the views of visitors. However, these impacts would only last the duration of construction, which is expected to be a total of one year.

Overall, the proposed action would be expected to have a beneficial impact on visitor use and experience.

Cumulative Impacts

Other past, present, or reasonably foreseeable actions that have or would contribute to the cumulative impacts on visitor use and experience include the Lodge at Mammoth Cave roof and exterior project, the Woodland Cottages project, the Hotel Cottages project, campground upgrades, the Heritage Trail Boardwalk project, and previous projects conducted to improve the visitor experience. These projects would generally have a beneficial impact on visitor use and experience by providing more comfortable, efficient, and updated accommodations for visitors. Specifically, the Heritage Trail Boardwalk project will have a beneficial impact by offering guests better access to park resources, though the sight and noise of the boardwalk from the proposed family cabins may be a slightly adverse impact to visitors staying in the cabins. The overall cumulative impact on visitor use and experience from these other actions would be beneficial.

Under the no-action alternative, there would be no site access changes or family cabins constructed to improve visitor use and experience, contributing an adverse increment to the cumulative impact on visitor experience. The beneficial impacts of the other past, present, and reasonably foreseeable project combined with the adverse impact of the no-action alternative would result in an overall, cumulative beneficial impact to visitor use and experience. Although there would continue to be a lack of accommodation and intuitive wayfinding, other accommodation improvements would enhance the visitor experience and provide more comfortable options for guests.

Under the proposed action, the construction of new family cabins and site access improvements would contribute a beneficial increment to the cumulative impact on visitor use and experience due to expanded lodging options, improved viewsheds, and more intuitive wayfinding. When considered with the actions



Existing view from access road towards Lodge at Mammoth Cave and associated parking lot



Rendering of view from proposed realigned access road towards Lodge at Mammoth Cave and associated parking lot

identified above, the overall beneficial impact of the proposed action would contribute to a beneficial impact on visitor use and experience. Therefore, the overall cumulative impact of the proposed action would be beneficial.

Conclusion

There would be adverse impacts on visitor use and experience under the no-action alternative because there would be no changes made to improve site access or to expand lodging options. The proposed action would result in beneficial impacts due to the addition of expanded lodging options that can accommodate larger groups, as well as the improved circulation that would improve visitors' connectivity and sense of arrival. Visitors would experience simplified access to green space, an improved viewshed of the lodge and visitor center, and less congestion in an easily navigable parking lot. Although the tennis and shuffleboard courts would be removed to make room for the reconfigured parking lot, the general site access improvements and cabin construction would beneficially impact visitor use and experience. On the whole, the proposed action would allow the NPS to elevate the overall visitor experience.
ASSESSMENT OF EFFECT ON HISTORIC PROPERTIES

Section 106 of the National Historic Preservation Act requires federal agencies to take into account the effects of their undertakings on historic properties. The implementing regulations for Section 106 (36 CFR 800) permit federal agencies to use the NEPA process for environmental assessments in lieu of a separate Section 106 process to meet those requirements (36 CFR 800.8[c]). In compliance with Section 106, the NPS, through this environmental assessment/assessment of effect, has provided the Kentucky State Historic Preservation Officer and associated Native American Tribes with an assessment of effect.

The assessment of effect on historic properties that are presented in this section respond to the requirements of Section 106 of the National Historic Preservation Act, in accordance with the regulations implementing Section 106 (36 CFR 800, Protection of Historic Properties). The effects of the no-action alternative and the proposed action are summarized below. The assessment of effect on historic properties was based on a review of previous studies, consideration of the proposed design concepts, and other information provided by the NPS.

AREA OF POTENTIAL EFFECT

In compliance with Section 106 regulations (36 CFR 800), an area of potential effect is defined for this project. The area of potential effect is defined as the geographic area in which an undertaking may directly or indirectly cause alterations in the character or use of historic properties if such properties exist. The area of potential effect for this project includes the project area and all areas from which changes to the landscape would be visible, as shown on figure 6.

IDENTIFICATION OF HISTORIC PROPERTIES

Historic properties within the area of potential effect include the Mammoth Cave Core Visitor Services Area Cultural Landscape. Several features within the area of potential effect are considered contributing to the cultural landscape including, but not limited to, spatial patterns of open lawn framed by mature trees, the Hotel Cottages and associated pedestrian trails, and the shuffleboard and tennis courts. Historic properties within the area of potential effect are described in detail in the "Affected Environment" section above under the impact topic of "Cultural Landscape."

In August 2018, a qualified archeological technician from the NPS Southeast Archeological Center conduced an archeological assessment within the project area. During this assessment, cultural materials were uncovered in several shovel test sites; however, no significant cultural resources were located, and no new sites were recorded. Additionally, it was noted in the assessment that the soils within these areas have been greatly disturbed by prior development activities. Therefore, the assessment concluded that no significant intact archeological deposits are likely to be encountered or affected by this project.

Mammoth Cave National Park Kentucky





Source: © 2019 Microsoft Corporation © 2019 DigitalGlobe ©CNES (2019) Distribution Airbus DS Construct Family Cabins and Improve Site Access Environmental Assessment/Assessment of Effect

ASSESSMENT OF EFFECT

No-Action Alternative

The no-action alternative does not constitute an undertaking under Section 106; therefore, no assessment of effect was completed for this alternative.

Proposed Action / NPS Preferred Alternative

There would be an *adverse effect* on historic properties under the proposed action due to the loss of the shuffleboard and tennis courts, which are considered contributing resources to the cultural landscape.

Under the proposed action, the removal of the parking lot directly in front of the Lodge at Mammoth Cave and the revegetation with lawn and trees would improve the historic character of the project area by reestablishing the open landscape featuring maintained lawns with groves of mature trees and removing the non-historic parking lot. Although the proposed pedestrian trails through this area would not follow the historic pedestrian circulation patterns, they would replace non-historic roads and pedestrian trails and would be more compatible with the cultural landscape than the existing infrastructure. Some mature trees would be removed to accommodate these changes to the project area; however, the removal would be of a relatively small amount of trees when compared to the overall forested area that would remain as a backdrop of the cultural landscape. Additionally, the area where trees would be removed is mostly lawn interspersed with mature trees and is not a forested area. Therefore, tree removal within this approximately 2-acre area in the southwest portion of the project area would not diminish the forested character of the landscape and would not detract from the remaining historic views.

The construction of a larger parking lot to the west of the lodge would require the removal of the 1939 tennis courts and shuffleboard courts. This action would result in the loss of historic structures and small-scale features, including a portion of chain link fence that is original to the early park development period. The action would also change the historic land use in this area from recreational use to parking. The loss of these contributing recreational resources would be considered an adverse effect on the cultural landscape. However, the loss would not diminish the overall historic character or integrity of the landscape, and it would continue to be able to convey association with the CCC era and the period of significance. The NPS will consult with the Kentucky SHPO to develop measures to mitigate the adverse effect resulting from the loss of the historic tennis and shuffleboard courts.

Under the proposed action, the construction of new family cabins would result in the addition of nonhistoric structures into the cultural landscape. However, these family cabins would be located in a previously-developed area that was previously used for lodging and would not visually detract from extant historic views to or from the historic Hotel Cottages or the original hotel site south of the current lodge parking lot. The appearance of the proposed family cabins would be designed to be compatible with the character of the cultural landscape in terms of material, color, and scale.

Under the proposed action, measures are in place to minimize or avoid adverse effects on historic properties within the area of potential effect, as described in the "Mitigation Measures" in chapter 2 of this document.

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CHAPTER 4: CONSULTATION AND COORDINATION

NPS Director's Order #12: *Conservation Planning, Environmental Impact Analysis, and Decision-making* requires the NPS to make "diligent" efforts to involve the interested and affected public in the NEPA process. This process helps to achieve the following: determine the important issues and eliminate those that are not; allocate assignments among the interdisciplinary team members and/or other participating agencies; identify related projects and associated documents; identify other permits, surveys, consultations, etc. required by other agencies; and create a schedule that allows adequate time to prepare and distribute the environmental document for public review and comment before a final decision is made. This chapter documents the agencies and tribes consulted during the NEPA process and summarizes the public review process for this EA/AOE.

AGENCY AND TRIBAL CONSULTATION

During the NEPA process, the NPS contacted the following agencies and tribes for consultation. See appendix B for copies of relevant pieces of correspondence between the NPS and these parties.

- Advisory Council on Historic Preservation
- Kentucky Heritage Council
- j Absentee-Shawnee Tribe of Indians of Oklahoma
- i Cherokee Nation
- i Chickasaw Nation
- i Eastern Band of Cherokee Indians
- i Eastern Shawnee Tribe of Oklahoma
- j Shawnee Tribe
- i United Keetoowah Band of Cherokee Indians

The NPS initiated consultation under NHPA Section 106 with the relevant agencies and tribes in a letter dated May 17, 2019. This letter informed the agencies and tribes that the NEPA process would be used to comply with Section 106 requirements pursuant to 36 CFR 800.8.

As required by Section 7 of the Endangered Species Act, the NPS will consult with the US Fish and Wildlife Service on the potential effects of the proposed action on federally listed species.

PUBLIC REVIEW

The EA/AOE will be on formal public and agency review for 30 days and has been distributed to a variety of interested individuals, agencies, and organizations. It also is available on the internet at https://parkplanning.nps.gov/maca, and hard copies are available at the Park's headquarters.

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APPENDIX A: WETLAND TECHNICAL REPORT

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Wetlands and Protected Species

Mammoth Cave National Park Environmental Assessment – Construct Family Cabins and Improve Site Access

PREPARED FOR



National Park Service Mammoth Cave National Park P.O. Box 7 Mammoth Cave, KY

PREPARED BY



351 McLaws Circle Suite 3 Williamsburg, VA 23185 757.220.0500

June 14, 2019

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Introduction

At the request of the National Park Service (NPS), VHB delineated the boundaries of jurisdictional wetlands and other waters of the United States (WOUS) regulated under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act (RHA). The study area is located within Mammoth Cave National Park (MACA), in Edmonson County, Kentucky (Attachment 1: Figure 1). It includes the parking lot and open areas south of the Lodge at Mammoth Cave (Lodge). The study area consists primarily of paved parking lots and maintained lawn with sparse to moderately dense trees and some landscaped ornamentals.

VHB conducted a detailed wetland delineation within the study area on October 2, 2018. The purpose of the delineation was to define the limits of jurisdictional waters in order to avoid wetland impacts during the planned parking lot reconfiguration and cabin construction. A brief site description is provided below along with Figures (Attachment 1), U.S. Army Corps of Engineers (USACE) wetland data forms (Attachment 2), photographic documentation of site conditions (Attachment 3), and the official species list obtained from the U.S. Fish and Wildlife Service (USFWS) IPaC database (Attachment 4).

2

Methodology

VHB applied the technical criteria outlined in the *Regional Supplement to the Corps* of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region (Version 2.0)¹ and associated guidance to identify jurisdictional boundaries in the study area. Preliminary site research used soil types identified by Natural Resources Conservation Service² (NRCS; Figure 2 in Attachment 1) as well as features depicted on the USFWS National Wetland Inventory (NWI)³ (Figure 3 in Attachment 1). Wetland flags were placed in the field by VHB, and each flag was geo-located using VHB's mobile technology platform capable of sub-meter accuracy. The results of the field wetland delineation are depicted on the Wetland Delineation Map (Figure 4 in Attachment 1). Data collection for USACE data sheets (Attachment 2) was conducted within representative wetland and upland habitat types along the wetland/upland transition, as appropriate. Plants encountered during sampling were identified to species level using regional references (where physiological characteristics were present), with nomenclature following the most recent National Wetland Plant List⁴. Representative photographs were taken of wetlands/uplands at each data point and are included as Attachment 3.

The USFWS Information for Planning and Consultation (IPaC) system⁵ was used to identify threatened and endangered species which may occur within the study area. At the time of the wetland delineation, a pedestrian survey of each parcel was completed to determine the presence of listed species or their habitats.

¹ U.S. Army Corps of Engineers (USACE). 2012. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountain and Piedmont Region (Version 2.0)*. Wetland Regulatory Assistance Program. April.

² U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS). Web Soil Survey. 2018. Available online at http://websoilsurvey.sc.egov.usda.gov/. Accessed May 3, 2018.

³ U.S. Fish and Wildlife Service (USFWS). 2018. National Wetland Inventory. Available online at https://www.fws.gov/wetlands/Data/Mapper.htm. Accessed May 3, 2018.

⁴ Lichvar, R.W., D.L. Banks, W.N. Kirchner, and N.C. Melvin. 2016. *The National Wetland Plant List*: 2016 wetland ratings. *Phytoneuron* 2016-30: 1-17. Published 28 April 2016. ISSN 2153 733X.

⁵ USFWS. 2018. Information for Planning and Consultation. https://ecos.fws.gov/ipac/location/index. Accessed May 3, 2018.

3

Results

3.1 Wetlands

Based on the NRCS Web Soil Survey, the study area is underlain by five soil maps units (Attachment 1; Figure 2). Table 1 shows the map unit symbol, map unit name, and hydric classification for each NRCS soil mapped in the subject site.

Map Unit Symbol	Map Unit Name	Hydric Status
СоВ	Clarkrange silt loam, 2 to 6 percent slopes	Not hydric
CoC	Clarkrange silt loam, 6 to 12 percent slopes	Not hydric
LyC2	Lily loam, 6 to 12 percent slopes, eroded	Not hydric
RoB	Rosine silt loam, 2 to 6 percent slopes	Not hydric
WbF	Wallen-Bledsoe-Donahue complex, 35 to 50 percent slopes, very rocky	Not hydric

Table 1 Summary of NRCS Soil Map Units within the Study Area

Source: NRCS 2018

The USFWS NWI mapping does not identify any wetlands or water bodies within the study area (Attachment 1; Figure 3).

The detailed wetland delineation conducted by VHB determined that one WOUS, a Palustrine Emergent (PEM) wetland, is present within the study area (Attachment 1; Figure 4). The PEM wetland (0.038 acres) is associated with a small depressional feature located on the flat terrace where the Lodge is located. The hydrology is provided by surface water run-off received from the parking lot and other nearby areas, and numerous hydrology indicators were observed including saturation at the soil surface. Vegetation is dominated by low spikesedge (*Kyllinga pumila*), field paspalum (*Paspalum laeve*), and creeping lespedeza (*Lespedeza repens*). Hydric soil indicator F3 (Depleted Matrix) is present within the wetland.

3.2 Non-Jurisdictional Uplands

Uplands on the property are primarily maintained lawns with scattered trees. Lawns consist of sod grasses typical for this region of Kentucky including Kentucky

bluegrass (*Poa pratensis*) and tall fescue (*Festuca arundinacea*). Trees consist of common tree species such as slippery elm (*Ulmus rubra*), blue ash (*Fraxinus quadrangulata*), sugar maple (*Acer saccharum*), white oak (*Quercus alba*), and tulip poplar (*Liriodendron tulipifera*).

4

Threatened and Endangered Species

The species list obtained through the USFWS IPaC database identified sixteen federally threatened or endangered species potentially occurring within the study area, Table 2.

Federal **Scientific Name Listed Species** Status Mammals Gray bat Myotis grisescens FE Indiana bat Myotis sodalist FE FT Northern long-eared bat Myotis septentrionalis Clams Clubshell Pleurobema clava FE Fanshell FE Cyprogenia stegaria Northern riffleshell FE Epioblasma torulosa rangiana Orangefoot pimpleback Plethobasus cooperianus FE FE Pink mucket Lampsilis abrupta Purple cat's paw Epioblasma obliquata obliquata FE Rabbitsfoot Quadrula cylindrica cylindrica FT **Ring pink** Obovaria refusa FE FF Rough pigtoe Pleurobema plenum Sheepnose mussel Plethobesus cyphyus FE Snuffbox mussel Epioblasma triquetra FE Cumberlandia monodonta FE Spectaclecase Crustaceans Kentucky cave shrimp Palaemonias ganteri FE **Critical Habitat** Indiana bat Myotis sodalist

Table 2 Federally Listed Wildlife Species Potentially Occurring within Study Area

Although species specific surveys were not completed, no threatened or endangered species were identified during the onsite pedestrian survey of the study area. Additionally, no habit for the clam or crustacean species is present within the study area. According to the known Indiana and northern long-eared bat habitat maps,^{6,7} MACA is summer and swarming habitat for both species. In addition, Edmonson County has known northern long-eared bat hibernacula.⁸

Included in this package are figures supporting the wetland delineation (Attachment 1); USACE regional supplement data sheets (Attachment 2), representative field photographs (Attachment 3), and the species list obtained from the IPaC database (Attachment 4).

⁶ USFWS. 2018. Known Indiana bat habitat in Kentucky and within 20 miles (January 2018). Located online at https://www.fws.gov/frankfort/pdf/MYSO_Habitat_map.pdf. Accessed: May 14, 2019.

⁷ USFWS. 2018. Known northern long-eared bay habitat in Kentucky and within 20 miles (January 2018). Located online at: https://www.fws.gov/frankfort/pdf/MYSE_Habitat_Map.pdf. Accessed: May 14, 2019.

⁸ USFWS. 2017. Kentucky Topographic Quadrangles Containing Northern Long-Eared Bay Roost Trees and/or Hibernaculum. Located online at: https://www.fws.gov/frankfort/pdf/KY_NLEB_Quad_List.pdf. Accessed: May 14, 2019.

Attachment 1

2018 Wetland Delineation Figures

Mammoth Cave National Park Kentucky





Construct Family Cabins and Improve Site Access Wetland Delineation

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/ Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

SCALE IN MILES

2.5

North

 $\widehat{\uparrow}$

0

FIGURE 1 Project Area

NATIONAL PARK Service

Mammoth Cave National Park Kentucky





 Study Area (15.16 Ac)

 Soil Map Unit Boundary

 CoB - Clarkrange silt loam, 2-6% slopes

 CoC - Clarkrange silt loam, 6-12% slopes

 LyC2 - Lily loam, 6-12% slopes, eroded

 RoB - Rosine silt loam, 2-6% slopes

 WbF - Wallen-Bledsoe-Donahue complex, 35-50% slopes, very rocky

Construct Family Cabins and Improve Site Access Wetland Delineation

> FIGURE 2 Soils Map











Construct Family Cabins and Improve Site Access Wetland Delineation

> FIGURE 3 National Wetlands Inventory Map



Mammoth Cave National Park Kentucky



North SCALE IN FEET Source: © 2019 Microsoft Corporation © 2019



Construct Family Cabins and Improve Site Access Wetland Delineation

> FIGURE 4 Potential Jurisdictional Features

Attachment 2

2018 USACE Data Sheets

WETLAND DETERMINATION DATA FORM - Eastern Mountains and Piedmont Re	gion
---	------

- whb	W	ETLAND DE	TERMINATION	DATA F	ORM - E	astern	Mounta	ins and Piedmont	Region	DP-1
Project Site:	Mammot	h Caves NP		City,	/County:	Edmonso	on County		Samp. Date: 10	/1/2018
Applicant/Owner:	National	Park Service				State:	Kentucky	Sampling Poir	nt: D	P-1
Investigator(s):	Sean Mur	ray			Section,	Townshi	ip, Range:	NA		
Subregion (LRP, or	MIRA).	I errace/Hills	120A	Lot: 27	19E2E4	concave, co	I ong:	Concave	Siope (%):	U-2
Soil Map Unit:	Clarkrang	e silt loam 6 to	120A	Lat. 37.	103234		Long.	-//.3/3135	NWI Classif :	Unland
Are climatic/hydrol	ogic condit	ions on the site	typical for this time	of year?		Yes	(If no, e	xplain in Remarks.)		opiana
Are Vegetation, Soi	l, or Hydrol	ogy significantly	disturbed?	No				Normal	Circumstances?	Yes
Are Vegetation, Soi	l, or Hydrol	ogy naturally pr	oblematic?	No				(If needed	d, explain any answ	ers in Remarks.)
		S Attach cit	o man chowing	, complo	noint la	ocation	trancor	etc important foat	uros oto	
SUIVIIVIART UF		5 - ALLACH SIL		s sample	point ic		s, transet	lis, important lead	ures, etc.	
Hydric Soil Present?		11.5					ls ⁻	This Sample Area Witl	hin a Wetland?	NO
Wetland Hydrology	Present?		NO				15			
Remarks:	One or n	nore paramete	ers lacking. Area i	is not a w	etland.					
	Data poi weed sp	nt located in a ecies.	shallow depress	ional area	a on a hill	slope. A	rea consist	ts of a regularly main	tained lawn with	turf grass and
HYDROLOGY										
Wetland Hydrology	Indicators							Secondary Indicators	(minimum of two r	equired)
Primary Indicators (ot one is require	а; check all that ap	ply)				Surface So	II Cracks (B6)	
Surface Water	r (AI) able (A2)		Aquatic Fauna	a (BI3) Plante (D14)	1			Sparsely V	egetated Concave Sur	Iace (B8)
Saturation (A3	3)		Hvdrogen Sul	fide Odor (C	(1)			Moss Trim	Lines (B16)	
Water Marks	(B1)		Oxidized Rhiz	ospheres or	n Living Roo	ts (C3)		Dry-Seasor	n Water Table (C2)	
Sediment Dep	osits (B2)		Presence of R	educed Iror	n (C4)			Crayfish Bu	urrows (C8)	
Drift Deposits	(B3)		Recent Iron R	eduction in	Tilled Soils	(C6)		Saturation	Visible on Aerial Ima	gery (C9)
Algal Mat or C	Crust (B4)		Thin Muck Su	rface (C7)				Stunted or	Stressed Plants (D1)	
Iron Deposits	(B5)		Other (Explain	n in Remark	s)			Geomorph	ic Position (D2)	
Inundation Vis	sible on Aeri	al (B7)						Microtopo	graphic Relief (D4)	
water-stained	Teaves (Ba							FAC-Neutr	ai Test (D5)	
Field Observations:			Denth (in	-1).	_					
Mater Table Prese	ent: +2	<u>NO</u>	Depth (ind	ches):	0		14/0	tland Hudrology Drocon	+7	NO
Saturation Present?))		Depth (ind	ches):	>12		vve	etianu nyurology Presen	<u> </u>	NU
	-							·		
SOIL	(8 11 1									
Profile Description:	(Describe t	o the depth hee	eded to document	ne indicat	or or conti	irm the ai	osence of ir	idicators.)		
(in) Color (IVIDUIX		Calar (maint)	Redux r	eatures	Turn o ¹	1.0.02	Tautura	De	
0-1 10YF	1110151) 2 3/2	100			70	туре	LUC	loam	Ke	IIIdIKS
1-6 10YF	R 4/4	95	10YR 5/8		5	с	m	clay loam	·	
6-12 10YF	R 4/4	70	10YR 5/8		5	С	m	clay loam		
6-12 10YF	R 4/2	25						loam	Mixtu	re of soils
12+								gravel	auger refusal	; gravel and rock
¹ Type: C=Concentration,	D=Depletion,	RM=Reduced Matrix	K, MS=Masked Sand Grai	ns.				² Location: PL=Pore Lining, N	/I=Matrix.	
Hydric Soil Indicato	rs:							Indicators for Problem	natic Hydric Soils ³	
Histosol (A1)	n (A2)		Dark S	Surface (S7)	Curfage (CO)	`		2 cm Muck	(A10)	
Black Histic (A	,3)		Polyva	aiue Below : Dark Surface	surrace (58))		Piedmont	Floodolain Soils (F19)	
Hydrogen Sulf	ide (A4)		Loam	v Gleved Ma	atrix (F2)			Very Shallo	ow Dark Surface (TF12	2)
Stratified Laye	ers (A5)		Deple	ted Matrix	(F3)			Other (Exp	lain in Remarks)	
2cm Muck (A1	LO)		Redox	Dark Surfa	ce (F6)					
Depleted Belo	w Dark Surf	ace (A11)	Deple	ted Dark Su	rface (F7)					
Thick Dark Sur	rtace (A12)		Redo>	Depression	ns (F8)	2)		³ Indicators	s of hydrophytic vege	tation and
Sandy Mucky	wineral (S1)		Iron-N	vianganese ic Surface (1	iviasses (F12 =13)	Z)		wetland hy	drology must be pres	ent, unless
Sandy Gleyed	(34) (S5)		Piedm	nont Floodn	lain Soils (F	19)		disturbed	or problematic.	
Stripped Matr	ix (S6)		Red P	arent Mate	rial (F21)	-,				
Restrictive Layer (if	observed):									
Type:	gravel ar	nd rock						Нус	Iric Soil Present?	NO
Depth (inches): Remarks:	12 No hude		re procont and	il doce e -	t most M		finition of	hudric coil: norom -t-	r is not mat	
	NO HYUH		is present and SO	4003 110	t meet N			nyane son, paramete	i is not met.	

VEGETATION - Use scientific names of plants.



	Absolute	Dom.	Indicator					
Tree Stratum (Plot size: 30' radius)	% Cover	Sp?	Status*	Dominance Te	st Worksh	eet:		
1.				# Dominants C	DBL, FACW	, FAC:	0	(A)
2.								
3.				# Dominants a	cross all st	rata:	1	(B)
4.								_ ` `
5.				% Dominants (OBL. FACW	/. FAC:		(A/B)
б					,	,		(· · · · = /
7				Prevalence Inc	lex Works	heet:		
/		- Tota	Cover	Total % Co	ver of	icct.	Multiply By	<i>.</i> .
Sanling Stratum (Diot size: 30' radius)		- 101a	I COVEI		ver or.	v 1 –	widitiply by	/
Saping Stratum (Plot Size: 50 radius)						X 1 =		
1				FACW		x 2 =		
2.				FAC		x 3 =		
3				FACU	88	x 4 =	352	
4				UPL	6	x 5 =	30	
5				Sum:	94	(A)	382	(B)
6								
7				Prevale	nce Index	= B/A =	4.06	
		= Tota	l Cover	Hydrophytic V	egetation	Indicators:		
Shrub Stratum (Plot size: 15' radius)				Do	minance T	Fest is > 50%		
1.				Pr	evalence l	ndex is <= 3.0		
2.				Pr	oblematic	Hydrophytic	Vegetation ¹ (e	explain)
3.				Ra	pid Test fo	or Hydrophyti	c Vegetation	
4				M	ornhologic	al Adaptation	is	
5					er prioro Bre	arr taap ta too		
5				Indicators of hydr	ric soil and we	etland hydrology	must be present	, unless
7				Definitions of	Vegetation	Strata		
/		- Toto		Demitions of	vegetation	i Strata.		
Hark Stratum (Distains) 10 redius		= 1018	Cover	Troo Westerle				(Car) an
Herb Stratum (Plot Size: 10 radius)	05	v	54611	more in height and	ants, excludin d 3in (7 6cm)	or larger in diam	pproximately 201 eter at breast be	ight (DBH)
1. Poa pratensis		<u> </u>	FACU	inore in neight and	a oni (7.000m)			.5.11 (0011).
	3		FACU					
3. Plantago lanceolata	3		UPL					
4. Lespedeza repens	3		UPL	Sapling - Woody	y plants, exclu	uding woody vine	s, approximately	20ft (6m)
5				or more in height	and less than	3in (7.6cm) DBH		
6.								
7								
8.				Shrub - Woody	plants, excluc	ling woody vines,	approximately 3	8 to 20ft (1
9.				to 6m) in height.				
10.								
11.				Herb - All herbad	ceous (non-w	oody) plants, inc	luding herbaceou	us vines,
12.				regardless of size.	Includes woo	ody plants, except	t woody vines, le	ss than
	94	= Tota	l Cover	approximately 3ft	(1m) in heigh	nt.		
Woody Vines (Plot size: 30' radius)								
2				Woody vine -		es regardless of	height	
2.				woody vinc 7	All WOOdy VIII	es, regardiess of	neight.	
s								
4				Ну	drophytic			
5				v	egetation			
		= Tota	l Cover		Present?		NO	
				<u> </u>				
Remarks: (If observed, list morphological adaptations below).								
No hydrophytic vogetation indicators present: paramet								
No hydrophytic vegetation indicators present, paramet	ter is not met.							

* Indicator Status utilizes 2016 NWPL

WETLAND DETERMINATION DATA FORM - Eastern Mountains and Piedmont Region

- Kat	•	WETLAND DE	TERMINATION D	ATA FORM -	Eastern	Mounta	ins and	l Piedmont l	Region	DP-2
Proiect Site:	Mamm	oth Caves NP		City/County:	Edmonso	on County			Samp. Date: 1	0/1/2018
Applicant/Owner:	Nation	al Park Service			State:	Kentucky		Sampling Poin	1	DP-2
Investigator(s):	Sean N	lurray		Section	, Townshi	ip, Range:	NA	1 0		
Landform (hillslope,	, terrace, etc.	: Terrace		Local relief	(concave, co	nvex, none):	Convex		Slope (%):	0-2
Subregion (LRR o	or MLRA):	LRR N; MLRA	120A L	at: 37.185239		Long:	-77.373	135	Datum:	WGS84
Soil Map Unit:	Clarkra	nge silt loam, 2 to	6 percent slopes						NWI Classif.:	Upland
Are climatic/hydro	ologic con	ditions on the site	typical for this time of	f year?	Yes	(If no, e	xplain in	Remarks.)		
Are Vegetation, So	oil, or Hyd	rology significantly	/ disturbed? No	0			_	Normal	Circumstances?	Yes
Are Vegetation, So	oil, or Hyd	rology naturally pi	roblematic? No	0			_	(If needed	i, explain any answ	ers in Remarks.)
			o man chawing c	ampla paint l	ocation	trancor	oto inor	ortant faati	urac ata	
SUIVIIVIARY OF		GS - Attach Sil	te map snowing s	ample point i	ocations	s, transet	us, imp	ortant leatt	ires, etc.	
Hydrophytic Vege	etation Pre	sent?	<u>NO</u>			10	This Can	anla Araa With	in a Watland?	NO
Motland Hydrolog	ilf av Procont	2	<u>NO</u>			15	11115 2011	ipie Area with	in a wetianur	NO
Remarks:	One of	: more naramete	ars lacking Area is r	not a wetland						
	Data p	oint located on	a hilltop. Area consi	ists of a regular	ly mainta	ined lawn	with tu	rf grass and w	eed species.	
HYDROLOGY										
Wetland Hydrolog	gy Indicato	rs:					Secon	dary Indicators	minimum of two r	equired)
Primary Indicators	s (minimur	n of one is require	ed; check all that apply	()			_	Surface Soi	l Cracks (B6)	
Surface Wat	ter (A1)		Aquatic Fauna (E	313)				Sparsely Ve	getated Concave Su	rface (B8)
High Water	Table (A2)		True Aquatic Pla	nts (B14)				Drainage Pa	atterns (B10)	
Saturation (A3)		Hydrogen Sulfide	e Odor (C1)				Moss Trim	Lines (B16)	
Water Mark	(B1)		Oxidized Rhizosp	pheres on Living Ro	ots (C3)			Dry-Season	Water Table (C2)	
Sediment De	eposits (B2)		Presence of Red	uced Iron (C4)	(66)			Crayfish Bu	rrows (C8)	
Drift Deposi	its (B3)		Recent Iron Red	uction in Tilled Soll	s (C6)			Saturation	Visible on Aerial Ima	gery (C9)
	r Crust (B4) tc (B5)		Other (Evolution in	(C7)				Geomorphi	Stressed Plants (D1)	
	ls (DD) Visible on A	erial (B7)		i Kellidi KSj				Geomorphi	Tranhic Relief (D4)	
Water-Stain	visible of A ned Leaves (B9)						FAC-Neutra	al Test (D5)	
Field Observation		557								
Field Observations	S:		Donth (inch							
Mator Table Pres	esent?	<u>NO</u>	Depth (inche Depth (inche	es). <u>0</u>		14/0	tland U	drology Drocon	+0	NO
Saturation Presen	entr ht?	<u>NO</u>	Depth (inche Depth (inche	25): <u>>18</u>		VVE	ецапо ну	drology Presen	Lr	NO
Remarks:	No pri	mary or seconda	ary indicators of we	tland hydrology	present;	paramete	er is not	met.		
SOIL										
Profile Description	n: (Describ	e to the depth ne	eded to document the	indicator or con	firm the al	bsence of ir	ndicators	.)		
Depth	Matr	ix		Redox Features			-uncure - c	•,		
(in) Color	r (moist)	%	Color (moist)	%	Type ¹	l oc ²		Texture	Re	marks
0-3 10	YR 3/2	100			.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	200		loam		
3-14 10	YR 3/4	60	7.5YR 3/4	5	с	m		clay loam		
3-14 10	YR 5/3	35						clay		
14-18 10	YR 5/3	60	7.5YR 3/4	5	С	m		clay		
14-18 10	YR 4/4	35						clay loam	mixtu	ire of soils
1 <u>-</u>							2			
Type: C=Concentration	in, D=Depletic	on, RM=Reduced Matri	x, MS=Masked Sand Grains.				Locatio	n: PL=Pore Lining, N	1=Matrix.	
Hydric Soil Indicat	tors:						Indicat	tors for Problem	natic Hydric Soils ³ :	
Histosol (A1	.)		Dark Sur	face (S7)				2 cm Muck	(A10)	
Histic Epiped	don (A2)		Polyvalu	e Below Surface (S	3)			Coast Prair	ie Redox (A16)	
Black Histic	(A3)		Thin Dar	k Surface (S9)				Piedmont F	loodplain Soils (F19)	
Hydrogen Su	ulfide (A4)		Loamy G	leyed Matrix (F2)				Very Shallo	w Dark Surface (TF1	2)
Stratified La	ayers (A5)		Depleted	d Matrix (F3)				Other (Expl	ain in Remarks)	
2cm Muck (/	A10)		Redox Da	ark Surface (F6)						
Depleted Be	elow Dark Si	urtace (A11)	Depleted	Dark Surface (F7)				2		
Thick Dark S	ourtace (A12	.)	Redox De	epressions (F8)	12)			⁴ Indicators	of hydrophytic vege	tation and
Sandy Muck	ky iviineral (S	51) 4)	Iron-Mar	nganese Masses (F1	12)			wetland hy	drology must be pre	sent, unless
Sanay Gieye	eu iviatrix (S v (SE)	+)		nt Floodolain Sails (F1Q)			disturbed d	or problematic.	
Stripped Ma	x (33) atrix (SE)		Pleamon Pod Para	nt Material (E21)	12)					
suipped Ma	ati in (30)		Keu Pare	iviateriai (FZI)						
Restrictive Laver ((if observe	d):								
Tvn	e:	-,-						Hvd	ric Soil Present?	NO
Depth (inches	s):							,u		
Remarks:	No hy	dric soil indicato	rs present and soil o	loes not meet N	ITCHS de	finition of	hydric s	oil; paramete	r is not met.	
	-									

VEGETATION - Use scientific names of plants.



				Absolute	Dom.	Indicator					
Tree Stratum (Plot size:	30' radius)	% Cover	Sp?	Status*	Dominance	Test Worksh	eet:		
1							# Dominant	s OBL, FACW	FAC:	1	(A)
2.				·							(=)
3.							# Dominant	s across all st	rata:	2	(B)
4. 							% Dominant		FAC.	E 0%/	(A /D)
5							% Dominan	IS UBL, FACW	, FAC:	50%	(A/B)
7				·			Prevalence	Index Works	neet:		
··					= Tota	Cover	Total %	Cover of:	leet.	Multiply B	
Sapling Stratum (Plot size:	30' radius)				OBL		x 1 =	inancipi) b	<u>,. </u>
1.	_						FACW		x 2 =		
2.							FAC	38	x 3 =	114	
3.							FACU	78	x 4 =	312	
4.							UPL	15	x 5 =	75	
5.							Sum:	131	(A)	501	(B)
6.											
7				·			Preva	alence Index	= B/A =	3.82	
					= Tota	Cover	Hydrophytic	Vegetation	ndicators:		
Shrub Stratum (Plot size:	15' radius)				,	Dominance T	est is > 50%		
1.	_		_^					Prevalence In	ndex is <= 3.0		
2.				·				Problematic	Hydrophytic \	/egetation ¹ (explain)
3.								Rapid Test fo	r Hydrophyti	c Vegetation	
4.								Morphologic	al Adaptation	S	
5.							¹ Indicators of h	ydric soil and we	tland hydrology	must be present	t, unless
6.							disturbed or pr	oblematic.			
7							Definitions	of Vegetation	Strata:		
	- . .				= Tota	l Cover	_				
Herb Stratum (Plot size:	10' radius	_)	63	v	54611	I ree - Woody	plants, excluding	g woody vines, ap or larger in diame	proximately 20 eter at breast be	ft (6m) or hight (DBH)
1. Poa pratens	ils auto			53	<u>×</u>		inore in neight				
2. Paspaium ia	nonc			<u> </u>							
4 Lespedeza r	enens			15			Sapling - Wo	ody plants exclu	ding woody vine	s annroximately	/ 20ft (6m)
5.	epens						or more in heig	ht and less than	3in (7.6cm) DBH.		, 2010 (0111)
6.											
7.				·							
8.				·			Shrub - Woo	dy plants, exclud	ing woody vines,	approximately 3	3 to 20ft (1
9.							to 6m) in heigh	t.			
10.											
11.							Herb - All her	baceous (non-w	oody) plants, incl	uding herbaceo	us vines,
12.							regardless of si approximately	ze. Includes woo 3ft (1m) in heigh	dy plants, except t.	woody vines, le	ess than
				131	= Tota	l Cover			-		
Woody Vines (Plot size:	30' radius	_)								
1. 2				·			Woody vine		or regardlass of h	oight	
2. 3				·			woody ville	An woody vini	.s, regardiess Ul I	icigiit.	
4								Hydrophytic			
								Vegetation			
					= Tota	Cover		Present?		NO	
Remarks: (If observed	d, list morpho	ological adaptation	is below).								
No hydrophy	tic vegetati	on indicators pro	esent; parameter	is not met.							

* Indicator Status utilizes 2016 NWPL

WETLAND DETERMINATION DATA FORM - Eastern Mountains and Piedmont Region

					mountu	ins and	i icumont ne		DF-3
Project Site: Mammot	h Caves NP		City/County:	Edmonso	on County			Samp. Date: 1	0/1/2018
Applicant/Owner: National	Park Service			State:	Kentucky		Sampling Point:		DP-3
Investigator(s): Sean Mu	rray		Section	, Townshi	ip, Range:	NA	-		
Landform (hillslope, terrace, etc.):	Terrace/Hillslo	ре	Local relief	(concave, co	nvex, none):	Concave		Slope (%):	3-5
Subregion (LRR or MLRA):	LRR N; MLRA 1	20A Lat:	37.184979		Long:	-77.3731	.35	Datum:	WGS84
Soil Map Unit: Clarkrang	ge silt loam, 2 to 6	percent slopes		N	(16		2	NWI Classif.:	Upland
Are Vegetation Soil or Hydrol	lons on the site ty	vpical for this time of yea	arr	res	(ii no, e	explain in l	Normal Cir	cumstances?	Voc
Are Vegetation, Soil, or Hydrol	logy naturally pro	blematic? No					(If needed, e	xplain any answ	vers in Remarks.)
		<u></u>				_	(,	,
SUMMARY OF FINDING	S - Attach site	map showing sam	ple point lo	ocations	s, transeo	cts, imp	ortant feature	es, etc.	
Hydrophytic Vegetation Prese	nt?	YES							
Hydric Soil Present?		NO			ls	This Sam	ple Area Within	a Wetland?	NO
Wetland Hydrology Present?		YES							
Remarks: One or n	nore parameter	s lacking. Area is not	a wetland.						
Data pol	int located in a c	epressional area on a	a nilisiope. A	rea cons	ists of a re	egulariy r	naintained lawr	1.	
HYDROLOGY									
Wetland Hydrology Indicators	:					Second	ary Indicators (mi	inimum of two r	equired)
Primary Indicators (minimum	of one is required	; check all that apply)					Surface Soil Cr	racks (B6)	
Surface Water (A1)		Aquatic Fauna (B13)					Sparsely Vege	tated Concave Su	rface (B8)
High Water Table (A2)		True Aquatic Plants	(B14)				Drainage Patte	erns (B10)	
Saturation (A3)	_	Hydrogen Sulfide Od	tor (C1)				Moss Trim Lin	es (B16)	
Water Marks (B1)	_	Uxidized Rhizospher	es on Living Roo	ots (C3)			Dry-Season W	ater Table (C2)	
Drift Deposits (B2)	_	Recent Iron Poduction	u ir Uli (C4) on in Tilled Soile	(C6)			Crayfish Burro	iws (Cō) ible on Aerial Ima	
Algal Mat or Crust (B4)	_	Thin Muck Surface ((77)	((())			Stunted or Str	essed Plants (D1)	gery (C3)
Iron Deposits (B5)		Other (Explain in Reg	marks)				Geomorphic P	Position (D2)	
Inundation Visible on Aeri	ial (B7)		indino)				Microtopogra	phic Relief (D4)	
Water-Stained Leaves (B9)					X	FAC-Neutral T	est (D5)	
Field Observations:									
Surface Water Present?	NO	Depth (inches):	0						
Water Table Present?	NO	Depth (inches):	>18		We	etland Hv	drology Present?		YES
Saturation Present?	NO	Depth (inches):	>18			,		-	
Remarks: At least	one primary or t	two secondary indica	tors of wetla	ections), i nd hydro	f available: blogy pres	ent; para	meter is met.		
Remarks: At least	one primary or t	two secondary indica	previous inspi	ections), i nd hydro	f available: blogy pres e	ent; para	meter is met.		
Remarks: At least	one primary or t	two secondary indica	tors of wetla	ections), i nd hydro	f available: plogy prese	ent; para	meter is met.		
Remarks: At least SOIL Profile Description: (Describe 1 Desth	one primary or t	two secondary indica	tors of wetla	ections), i nd hydro	f available: blogy pres ection	ent; para	meter is met.		
Remarks: At least SOIL Profile Description: (Describe t Depth Matrix (in) Color (main)	one primary or t	led to document the inc Calac (mainted)	dicator or conf	irm the al	f available: blogy pres ector	ent; para	meter is met.		
Remarks: At least SOIL Profile Description: (Describe 1 Depth Matrix (in) Color (moist) 10/R 3/3	to the depth need	led to document the inc Color (moist) 7 5VB 3/4	dicator or conf	irm the al	f available: blogy press bsence of ir Loc ² m	ent; para	meter is met.	Re	emarks
Remarks: At least SOIL Profile Description: (Describe 1 Profile Description: (Describe 1 Matrix (in) Color (moist) 0-4 10YR 3/3 4-18 10YR 4/3	one primary or 1	led to document the inc Color (moist) 7.5YR 3/4 7.5YR 5/8	dicator or conf dox Features	irm the al	f available: blogy prese bsence of ir Loc ² m m	ent; para	meter is met.	Re	emarks
Remarks: At least SOIL Profile Description: (Describe 1 Pepth Matrix (in) Color (moist) 0-4 10YR 3/3 4-18 10YR 4/3 10YR 4/2 10YR 4/2	one primary or to to the depth need % 95 60 30	led to document the inc Rec Color (moist) 7.5YR 3/4 7.5YR 5/8	dicator or conf dox Features	irm the al	f available: blogy prese bsence of ir Loc ² m m	ent; para	meter is met.	Re 	emarks ire of soils
Remarks: At least SOIL Profile Description: (Describe to be consist) Depth Matrix (in) Color (moist) 0-4 10YR 3/3 4-18 10YR 4/3 4-18 10YR 4/2	one primary or 1	led to document the inc Rec Color (moist) 7.5YR 3/4 7.5YR 5/8	dicator or conf dox Features 5 10	irm the al	f available: blogy prese bsence of ir Loc ² m m	ent; para	meter is met.		emarks ire of soils
Remarks: At least SOIL Profile Description: (Describe 1 Depth Matrix (in) Color (moist) 0-4 10YR 3/3 4-18 10YR 4/3 4-18 10YR 4/3 1-18 10YR 4/3	one primary or 1	two secondary indicates in the incomposition of the	dicator or conf dox Features 5 10	irm the al	f available: blogy prese bsence of ir Loc ² m m	ent; para	meter is met.	Re 	emarks ire of soils
Remarks: At least SOIL Profile Description: (Describe 1 Depth Matrix (in) Color (moist) 0-4 10YR 3/3 4-18 10YR 4/3 4-18 10YR 4/3	one primary or 1	two secondary indicates the incomposition of the in	dicator or conf dox Features % 5 10	irm the al	f available: blogy prese bsence of ir Loc ² m m	ent; para	meter is met.	Re mixtu Matrix. ic Hydric Soils ³ :	emarks rre of soils
Remarks: At least SOIL Profile Description: (Describe 1 Depth Matrix (in) Color (moist) 0-4 10YR 3/3 4-18 10YR 4/3 4-18 10YR 4/3 1-17ype: C=Concentration, D=Depletion, Hydric Soil Indicators:	one primary or 1	led to document the inc Rec Color (moist) 7.5YR 3/4 7.5YR 5/8 MS=Masked Sand Grains.	dicator or conf dox Features % 5 10 	irm the al	f available: blogy preserves bsence of ir Loc ² m m m	ent; para	meter is met.	Re mixtu Matrix. ic Hydric Soils ³ :	emarks rre of soils
Remarks: At least SOIL Profile Description: (Describe 1 Profile Description: (Describe 1 Matrix (in) Color (moist) 0-4 10YR 3/3 4-18 10YR 4/3 4-18 10YR 4/2	one primary or 1	Ied to document the inc Rec Color (moist) 7.5YR 3/4 7.5YR 5/8 MS=Masked Sand Grains.	dicator or conf dox Features % 5 10 (S7)	irm the al	f available: blogy preserves bsence of ir Loc ² m m m	ent; para	meter is met.	Re mixtu Matrix. ic Hydric Soils ³ : 10) 20dox (A16)	emarks re of soils
Remarks: At least SOIL Profile Description: (Describe 1 Profile Description: (Describe 1 Matrix (in) Color (moist) 0-4 10YR 3/3 4-18 10YR 4/3 4-18 10YR 4/2	one primary or 1	Ied to document the inc Rec Color (moist) 7.5YR 3/4 7.5YR 5/8 MS=Masked Sand Grains.	dicator or conf dox Features % 5 10 2 2 (S7) 2 (S7) 2 (S7) 2 (S9)	irm the al	f available: blogy preserves bsence of ir Loc ² m m	ent; para	meter is met.	Re mixtu fatrix. ic Hydric Soils ³ : 10) Redox (A16) ofolain Soils (E19)	emarks ire of soils
Remarks: At least SOIL Profile Description: (Describe 1 Profile Description: (Describe 1 Matrix (in) Color (moist) 0-4 10YR 3/3 4-18 10YR 4/3 4-18 10YR 4/2	one primary or 1	Ied to document the inc Rec Color (moist) 7.5YR 3/4 7.5YR 5/8 MS=Masked Sand Grains.	tors of wetla	irm the al	f available: blogy preset bsence of ir Loc ² m m	ent; para	meter is met. Texture lay loam clay PL=Pore Lining, M=M prs for Problemat 2 cm Muck (A: Coast Prairie for Piedmont Floc Very Shallow (Re mixtu Matrix. ic Hydric Soils ³ : 10) Redox (A16) odplain Soils (F19) Dark Surface (TF1	emarks ire of soils
Remarks: At least SOIL Profile Description: (Describe 1 Profile Description: (Describe 1 Matrix (in) Color (moist) 0-4 10YR 3/3 4-18 10YR 4/3 4-18 10YR 4/2	one primary or 1	Ied to document the inc Rec Color (moist) 7.5YR 3/4 7.5YR 5/8 MS=Masked Sand Grains. MS=Masked Sand Grains.	tors of wetla	irm the al	f available: blogy preserved bsence of ir Loc ² m m m	ent; para	meter is met. Texture lay loam clay : PL=Pore Lining, M=N cray : PL=Pore Lining, M=N cost for Problemat 2 cm Muck (A: Coast Prairie F Piedmont Floc Very Shallow I Other (Explain	Re mixtu Matrix. ic Hydric Soils ³ : 10) Redox (A16) odplain Soils (F19) Dark Surface (TF1: h in Remarks)	emarks re of soils
Remarks: At least SOIL Profile Description: (Describe 1 Profile Description: (Describe 1 Matrix (in) Color (moist) 0-4 10YR 3/3 4-18 10YR 4/3 4-18 10YR 4/3 4-18 10YR 4/2	one primary or 1	Ied to document the inc Rec Color (moist) 7.5YR 3/4 7.5YR 5/8 MS=Masked Sand Grains. MS=Masked Sand Grains.	tors of wetla	irm the al	f available: blogy preserved bsence of ir Loc ² m m m	ent; para	meter is met. Texture lay loam clay PL=Pore Lining, M=N ors for Problemat 2 cm Muck (Ai Coast Prairie F Piedmont Floc Very Shallow I Other (Explain	Redox (A16) Dark Surface (TF1: in Remarks)	emarks re of soils
Remarks: At least SOIL Profile Description: (Describe 1 Profile Description: (Describe 1 Matrix (in) Color (moist) 0-4 10YR 3/3 4-18 10YR 4/3 4-18 10YR 4/2	to the depth need	Ied to document the inc Rec Color (moist) 7.5YR 3/4 7.5YR 5/8 MS=Masked Sand Grains. MS=Masked Sand Grains.	tors of wetla	irm the al	f available: blogy preserved bsence of ir Loc ² m m m	ent; para	meter is met. Texture lay loam clay PL=Pore Lining, M=N ors for Problemat 2 cm Muck (Ai Coast Prairie F Piedmont Floc Very Shallow I Other (Explain	Re mixtu Matrix. ic Hydric Soils ³ : 10) Redox (A16) odplain Soils (F19) Dark Surface (TF1: in Remarks)	emarks re of soils
Remarks: At least SOIL Profile Description: (Describe 1 Profile Description: (Describe 1 Matrix (in) Color (moist) 0-4 10YR 3/3 4-18 10YR 4/3 4-18 10YR 4/2	to the depth need	Ied to document the inc Rec Color (moist) 7.5YR 3/4 7.5YR 5/8 MS=Masked Sand Grains. MS=Masked Sand Grains.	tors of wetla	irm the al	f available: blogy preserved bsence of ir Loc ² m m m	ent; para	meter is met. Texture lay loam lay loam clay : PL=Pore Lining, M=N prs for Problemat 2 cm Muck (A: Coast Prairie F Piedmont Floc Very Shallow I Other (Explain ³ Indicators of	Re mixtu Matrix. ic Hydric Soils ³ : 10) Redox (A16) Doark Surface (TF1: i in Remarks) hydrophytic vege	emarks re of soils 2) tation and
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Remarks: At least SOIL Profile Description: (Describe to Depth	one primary or 1	Ied to document the inc Rec Color (moist) 7.5YR 3/4 7.5YR 5/8 MS=Masked Sand Grains. MS=Masked Sand Grains.	dicator or conf dox Features % 5 10 2 2 3 3 3 3 3 5 3 3 5 5 3 5 3 5 5 3 5	irm the al	f available: blogy preserves bsence of ir Loc ² m m	ent; para	Texture Texture lay loam clay loam clay pressor Problemat 2 cm Muck (A: Coast Prairie F Piedmont Flor Very Shallow I Other (Explain ³ Indicators of wetland hydro disturbed or p	Re mixtu Matrix. ic Hydric Soils ³ : 10) Redox (A16) Joark Surface (TF1) Dark Surface (TF1) in Remarks) hydrophytic vege plogy must be pre iroblematic.	emarks re of soils 2) tation and sent, unless
Remarks: At least SOIL Profile Description: (Describe to Depth Depth Matrix. (in) Color (moist) 0-4 10YR 3/3 4-18 10YR 4/3 4-18 10YR 4/3 4-18 10YR 4/3 4-18 10YR 4/2	one primary or 1	Ied to document the inc Rec Color (moist) 7.5YR 3/4 7.5YR 5/8 MS=Masked Sand Grains. MS=Masked Sand Grains.	dicator or conf dox Features % 5 10 2 2 3 3 3 3 3 5 3 3 5 5 3 5 3 5 5 3 5	ections), i nd hydro irm the al Type ¹ c c c c c c c c c c c c c	f available: blogy prese bsence of ir Loc ² m m	ent; para	Texture Texture lay loam clay loam clay PL=Pore Lining, M=N ors for Problemat 2 cm Muck (A: Coast Prairie F Piedmont Flor Very Shallow I Other (Explain ³ Indicators of wetland hydrod disturbed or p	Re mixtu mixtu fatrix. ic Hydric Soils ³ : 10) Redox (A16) odplain Soils (F19) Dark Surface (TF1) in Remarks) hydrophytic vege plogy must be pre roblematic.	emarks re of soils 2) tation and sent, unless
Remarks: At least SOIL Profile Description: (Describe 1 Depth Matrix (in) Color (moist) 0-4 10YR 3/3 4-18 10YR 4/3 4-18 10YR 4/3 4-18 10YR 4/2	one primary or 1	Ied to document the inc Rec Color (moist) 7.5YR 3/4 7.5YR 5/8 MS=Masked Sand Grains. MS=Masked Sand Grains. MS=Masked Sand Grains.	dicator or conf dox Features % 5 10 2 2 3 3 4 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	ections), i nd hydro irm the al Type ¹ c c c c c c c c c c c c c	f available: blogy prese bsence of ir Loc ² m m	ent; para	meter is met. Texture lay loam clay loam clay pressor Problemat 2 cm Muck (A: Coast Prairie F Piedmont Floc Very Shallow I Other (Explain ³ Indicators of wetland hydroc disturbed or p	Re mixtu mixtu fatrix. ic Hydric Soils ³ : 10) Redox (A16) odplain Soils (F19) Dark Surface (TF1: n Remarks) hydrophytic vege pology must be pre roblematic.	emarks re of soils 2) tation and sent, unless
Remarks: At least SOIL Profile Description: (Describe 1 Depth Matrix (in) Color (moist) 0-4 10YR 3/3 4-18 10YR 4/3 4-18 10YR 4/3 4-18 10YR 4/2	one primary or 1	Ied to document the inc Rec Color (moist) 7.5YR 3/4 7.5YR 3/4 7.5YR 5/8 MS=Masked Sand Grains. MS=Masked Sand Grains. MS=Masked Sand Grains.	tors of wetla dicator or conf dox Features % 5 10 (S7) elow Surface (S8) rface (S9) ed Matrix (F2) strix (F3) Surface (F6) rk Surface (F6) rk Surface (F6) rk Surface (F7) essions (F8) nese Masses (F1 ace (F13) bodplain Soils (F Material (F21)	ections), i nd hydro irm the al Type ¹ c c c c c c c c c c c c c	f available: blogy prese bsence of ir Loc ² m m	ent; para	Texture Texture Tay loam Texture Tay loam Tay loam Texture Tay loam Texture Te	Re mixtu Matrix. ic Hydric Soils ³ : 10) Redox (A16) Dark Surface (TF1: i in Remarks) hydrophytic vege plogy must be pre roblematic.	emarks re of soils 2) tation and sent, unless
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Remarks: At least SOIL Profile Description: (Describe 1 Depth Matrix (in) Color (moist) 0-4 10YR 3/3 4-18 10YR 4/3 4-18 10YR 4/3 4-18 10YR 4/2	one primary or 1 to the depth need % 95 60 30 RM=Reduced Matrix, 1 face (A11)	Ied to document the inc Rec Color (moist) 7.5YR 3/4 7.5YR 5/8 MS=Masked Sand Grains. MS=Masked Sand Grains. MS=Masked Sand Grains. MS=Masked Sand Grains.	tors of wetla	ections), i nd hydro irm the al Type ¹ c c c c c c c c c c c c c	f available: biogy press bisence of ir Loc ² m m	ent; para	meter is met.	Re mixtu mixtu Matrix. ic Hydric Soils ³ : 10) Redox (A16) odplain Soils (F19) Dark Surface (TF1: i in Remarks) hydrophytic vege plogy must be pre roblematic. Soil Present?	emarks re of soils 2) tation and sent, unless NO
Remarks: At least SOIL Profile Description: (Describe 1 Depth Matrix (in) Color (moist) 0-4 10YR 3/3 4-18 10YR 4/3 4-18 10YR 4/3 4-18 10YR 4/2	one primary or 1 to the depth need % 95 60 30 RM=Reduced Matrix, 1 face (A11)	Ied to document the inc Rec Color (moist) 7.5YR 3/4 7.5YR 3/4 7.5YR 5/8 MS=Masked Sand Grains. MS=Masked Sand Grains.	dicator or conf dox Features % 5 10 2 2 3 3 3 3 3 4 3 5 5 5 5 5 5 5 5 5 5 5 5 5	irm the al	f available: boom press boom	ent; para	Texture Texture lay loam clay loam clay clay : PL=Pore Lining, M=M ors for Problemat 2 cm Muck (A: Coast Prairie F Piedmont Floc Very Shallow I Other (Explain ³ Indicators of wetland hydro disturbed or p Hydric bil; parameter is	Re mixtu mixtu Matrix. ic Hydric Soils ³ : 10) Redox (A16) odplain Soils (F19) Dark Surface (TF1: i in Remarks) hydrophytic vege plogy must be pre roblematic. Soil Present? sont met.	emarks re of soils 2) tation and sent, unless NO
Remarks: At least SOIL Profile Description: (Describe 1 Depth Matrix (in) Color (moist) 0-4 10YR 3/3 4-18 10YR 4/3 4-18 10YR 4/3 4-18 10YR 4/2	to the depth need % 95 60 30 RM=Reduced Matrix, I acce (A11)	Ied to document the inc Rec Color (moist) 7.5YR 3/4 7.5YR 5/8 MS=Masked Sand Grains. MS=Masked S	dicator or conf dox Features % 5 10 (S7) (S7) (S7) (S7) (S7) (S7) (S7) (S7)	irm the al	favailable: booon of in Loc ² m m finition of	ent; para	meter is met.	Re mixtu mixtu Matrix. ic Hydric Soils ³ : 10) Redox (A16) odplain Soils (F19) Dark Surface (TF1) in Remarks) hydrophytic vege plogy must be pre roblematic. Soil Present? s not met.	emarks re of soils 2) tation and sent, unless NO

VEGETATION - Use scientific names of plants.



	Absolute	Dom.	Indicator			
Tree Stratum (Plot size: 30' radius)	% Cover	Sp?	Status*	Dominance Test Worksheet:		
1				# Dominants OBL, FACW, FAC:	2	(A)
2.		·				(-)
3.				# Dominants across all strata:	2	(B)
4					100%	(4 (0)
5				% Dominants OBL, FACW, FAC.	100%	_(А/В)
7		·		Prevalence Index Worksheet		
	·	= Tota	Cover	Total % Cover of:	Multiply By	<i>.</i> .
Sapling Stratum (Plot size: 30' radius)		Tota		OBL x1=		
1.				FACW 101 x 2 =	202	
2.		·		FAC 15 x 3 =	45	
3.				FACU x 4 =		
4.		·		UPL x 5 =		
5.				Sum: 116 (A)	247	(B)
6.						
7.				Prevalence Index = B/A =	2.13	
		= Tota	l Cover	Hydrophytic Vegetation Indicators:		
Shrub Stratum (Plot size: 15' radius)				X Dominance Test is > 50%		
1				X Prevalence Index is <= 3.	0	
2				Problematic Hydrophytic	: Vegetation ⁺ (explain)
3				X Rapid Test for Hydrophy	tic Vegetation	
4				Morphological Adaptatic	ons	
5				¹ Indicators of hydric soil and wetland hydrolog	y must be present	, unless
6				disturbed or problematic.		
7				Definitions of Vegetation Strata:		
(Distriction 10) and inc.		= lota	l Cover	Tree we have a literation		5 (G)
1 Kullinga bravifalia	62	v	EACW/	more in height and 3in (7.6cm) or larger in dia	approximately 201 neter at breast he	ight (DBH).
Rynniga brevnona	20	~ <u>~</u>				0 ,
2. Persicalla maculosa						
		·	FAC	Sapling Weedu sleets susluding weedu vi	os opprovinstal.	20ft (Cm)
4				or more in height and less than 3in (7.6cm) DB	H.	2011 (0111)
6		·				
7						
2 2	·	·		Shrub - Woody plants, avaluding woody ving	c approximately 7	to 20ft (1
0				to 6m) in height.	s, approximately s	5 to 2011 (1
11	· · · · · · · · · · · · · · · · · · ·	·		Herb - All berbaceous (non-woody) plants in	cluding berbaceo	is vines
12		·		regardless of size. Includes woody plants, exce	pt woody vines, le	ss than
<u> </u>	116	= Tota	l Cover	approximately 3ft (1m) in height.		
Woody Vines (Plot size: 30' radius)		Tota				
2				Woody vine - All woody vines, regardless o	f height.	
3	·					
4.				Hydrophytic		
5.				Vegetation		
		= Tota	l Cover	Present?	YES	
Remarks: (If observed, list morphological adaptations below).				•		
Indicator 1 (Rapid Test) present due to dominance o	f FACW or OBL sp	ecies.				
····· (· F · · · · / F · · · · · · · · · · · ·						

* Indicator Status utilizes 2016 NWPL

WETLAND DETERMINATION DATA FORM - Eastern Mountains and Piedmont Region

- Market	WET	LAND DETEI	RMINATION DAT	A FORM -	Eastern	Mounta	ins and	l Piedmont Re	gion	DP-
Project Site:	Mammoth Ca	ives NP		City/County:	Edmonso	on County			Samp. Date: 10	/1/2018
Applicant/Owner:	National Park	Service		<u> </u>	State:	Kentucky		Sampling Point:)P-4
Investigator(s):	Sean Murray			Section	, Townshi	ip, Range:	NA	·		
Landform (hillslope, te	terrace, etc.): Te	errace		Local relief	(concave, co	nvex, none):	Concav	e	Slope (%):	0-2
Subregion (LRR or	r MLRA): L	RR N; MLRA 120	DA Lat:	37.185359		Long:	-77.373	135	Datum:	WGS84
Soil Map Unit:	Clarkrange sil	t loam, 2 to 6 p	ercent slopes			4.6			NWI Classif.:	Upland
Are climatic/hydrol	logic conditions	on the site typi	cal for this time of ye	ar?	Yes	(If no, e	xplain in	Remarks.)		
Are Vegetation, Soi	il, or Hydrology	significantly dis	turbed? <u>No</u>				_	Normal Cir	cumstances?	Yes
Are vegetation, so	ii, or Hydrology	naturally proble	ematic: <u>No</u>					(ii needed, e	xplain any answ	ers in Remarks.)
SUMMARY OF	FINDINGS -	Attach site r	nap showing sam	nple point l	ocation	s, transeo	cts, imp	oortant feature	es, etc.	
Hydrophytic Vegeta	ation Present?		YES			ls ⁻	This San	nnle Area Within	a Wetland?	NO
Wetland Hydrology	v Present?		YES							
Remarks:	One or more	e parameters l	acking. Area is not	a wetland.						
	Data point l	ocated in a de	pressional area on	a flat hilltop	. The are	a is regula	irly mow	ved and maintain	ned.	
HYDROLOGY										
Wetland Hydrology	y Indicators:	o is roouized	bock all that are his				Secon	dary Indicators (mi	inimum of two r	equired)
Primary indicators	(minimum of or	ne is required; c	meck all that apply)					Surrace Soil Ci	acks (Bb)	
X Surface Wate	er (A1)		Aquatic Fauna (B13)	(04.4)			X	Sparsely Vege	tated Concave Sur	tace (B8)
A High Water Ia	able (AZ)		Hydrogon Sulfide Of	(D14) for (C1)			·	Moss Trim Lin	er (B16) es (B16)	
Mater Marks	(B1)			es on Living Ro	ots (C3)			Dry-Season W	es (DIO) ater Table (C2)	
Sediment Der	posits (B2)		Presence of Reduce	d Iron (C4)	013 (03)			Cravfish Burro	ws (C8)	
Drift Deposits	s (B3)		Recent Iron Reducti	on in Tilled Soils	s (C6)			Saturation Vis	ible on Aerial Ima	zerv (C9)
Algal Mat or (Crust (B4)	·	Thin Muck Surface (C7)	(00)			Stunted or Str	essed Plants (D1)	50.7 (007
Iron Deposits	s (B5)		Other (Explain in Re	marks)				Geomorphic P	osition (D2)	
Inundation Vi	isible on Aerial (B	7)						Microtopogra	phic Relief (D4)	
Water-Staine	ed Leaves (B9)						Х	FAC-Neutral T	est (D5)	
Field Observations:	:				1					
Surface Water Pres	sent?	VES	Depth (inches):	1						
Water Table Preser	nt?	YES	Depth (inches):	0		We	etland Hy	drology Present?		YES
Saturation Present	.?	YES	Depth (inches):	0						
SOIL										
Profile Description:	: (Describe to th	e depth needeo	d to document the ind	dicator or conf	firm the al	bsence of ir	ndicators	.)		
(in) Color	iviaurix		Rec	JOX Features	T	1 2		T	D -	
(in) Color	(moist)	75	Color (moist)	<u>%</u>	Type	LOC		lexture	Crowol 109	marks
4-12 1011 4-12	R 4/3	40	7.5YR 5/8	10	<u> </u>	m		clay loam	Graver 107	o; Charcoal 5%
4-12 10Y	R 4/3	40		·				clay loam	gravel 5%	: charcoal 5%
12+								gravel	Auger refusal	, gravel and rock
1							2.			
Type: C=Concentration,	, D=Depletion, RM=I	Reduced Matrix, MS	=Masked Sand Grains.				-Locatio	n: PL=Pore Lining, M=N	iatrix.	
Hydric Soll Indicato	015:						Indicat	ors for Problemat	ic Hydric Soils ² :	
Histosol (A1)			Dark Surface	e (S7)				2 cm Muck (A	10)	
Histic Epipedo	on (A2)		Polyvalue Be	elow Surface (S8	3)			Coast Prairie F	Redox (A16)	
Black Histic (A	A3)		Thin Dark Su	irface (S9)				Piedmont Floo	odplain Soils (F19)	
Hydrogen Sulf	Ifide (A4)		Loamy Gleye	ed Matrix (F2)				Very Shallow I	Dark Surface (TF12	2)
Stratified Laye	rers (A5)		Depleted Ma	atrix (F3)				Other (Explain	in Remarks)	
2cm Muck (A	(IU) ow Dark Surface ((11)	Redox Dark	surface (F6)						
Depieted Beit	ow Dark Surface (A11)	Depieted Da	rk Suriace (F7)				3		
Sandy Muchy	(Mineral (S1)			200103 (1 0) 1656 Massoc (E1	2)			indicators of	nyarophytic veget	ation and
	Matrix (S4)		Umbric Surf	ace (F13)				disturbed or p	roblomatic	ent, unless
Sandy Mucky Sandy Gleved	(\$5)		Piedmont Fl	oodplain Soils (I	F19)			ustui beu of p	obientatie.	
Sandy Rideky Sandy Gleyed Sandy Redox			Red Parent I	Material (F21)	-,					
Sandy Mideky Sandy Gleyed Sandy Redox	rix (S6)									
Sandy Micky Sandy Gleyed Sandy Redox Stripped Mati	f observed):									
Sandy Gleyed Sandy Gleyed Sandy Redox Stripped Mati Restrictive Layer (if Type:	rix (S6) f observed): :: gravel and re	ock						Hydric	Soil Present?	NO
Sandy Gleyed Sandy Redox Stripped Mati Restrictive Layer (if Type: Depth (inches):	rix (S6) f observed): : gravel and r : 12	ock						Hydric	Soil Present?	NO
Sandy Gleyed Sandy Gleyed Sandy Redox Stripped Mati Restrictive Layer (if Type: Depth (inches):	f observed): gravel and ro 12	ock						Hydric	Soil Present?	NO

VEGETATION - Use scientific names of plants.



			Absolute	Dom.	Indicator					
Tree Stratum	(Plot size:	30' radius)	% Cover	Sp?	Status*	Dominance	e Test Worksh	neet:	-	<i>(</i> .)
1				·		# Dominan	ts OBL, FACW	/, FAC:	2	(A)
2				·		# Dominan	ts across all s	trata	2	(P)
з. 				·		# Dominan		trata.		(0)
5.						% Dominar	nts OBL, FACV	V, FAC:	100%	(A/B)
6.										
7						Prevalence	Index Works	heet:		
				= Tota	l Cover	Total %	Cover of:	-	Multiply By	/:
Sapling Stratum	(Plot size:	30' radius)				OBL		x 1 =		
1.				·		FACW	53	x 2 =	106	
2				·				X3=		
з. л								- x4= x5=		_
-4. 5.				·		Sum:	53	(A)	106	(B)
6.				·		Juni.				(0)
7.						Prev	alence Index	= B/A =	2.00	
				- .			,			
		1E' radius		= lota	I Cover	Hydrophyti	IC Vegetation	Indicators:		
Shrub Stratum	(Plot size:					×	Dominance Provalance	Test is $> 50\%$		
1 2						^	Problematic	Hydronhytic	legetation ¹	ovolain)
3				·		x	Rapid Test f	or Hydrophytic	CVegetation	explain)
4.							Morphologi	cal Adaptation	IS	
5.				·		¹ Indicators of	hudric coil and u		must be present	unloss
6.						disturbed or p	roblematic.	etianu nyurology	must be present	, uniess
7.						Definitions	of Vegetatio	n Strata:		
				= Tota	l Cover					
Herb Stratum	(Plot size:	10' radius)				Tree - Wood	y plants, excludii	ng woody vines, ap	oproximately 20	ft (6m) or
1. Kyllinga	brevifolia		38	<u> </u>	FACW	more in height	t and 3in (7.6cm) or larger in diam	eter at breast he	ight (DBH).
2. Persicari	a maculosa		15	<u> </u>	FACW					
3.				·		Cooling w				2001 (5.)
4. 5				·		or more in hei	oody plants, excl ight and less that	n 3in (7.6cm) DBH	s, approximately	20ft (6m)
5. 										
7.				·						
8.				·		Shrub - woo	ody plants, exclu	ding woody vines,	approximately 3	3 to 20ft (1
9.						to 6m) in heig	ht.			
10.										
11.						Herb - All he	erbaceous (non-v	voody) plants, incl	uding herbaceou	us vines,
12.						regardless of s	size. Includes wo (3ft (1m) in beig	ody plants, except ht	woody vines, le	ss than
			53	= Tota	l Cover	approximatery	Sit (11) in nois			
Woody Vines	(Plot size:	30' radius)								
1										
2.				·		Woody vin	e - All woody vir	nes, regardless of I	neight.	
3.				·						
4. 5				·			Hydrophytic			
J					Cover		Drocont2		VEC	
				= 10(a	Cover		Present?		163	_
Remarks: (If obco	rved list marnh	ological adaptations below)				ļ				
Indicator	1 (Panid Tact)	procent due to dominance		ocioc						
mulcator	I (napiù lest)	present due to dominand	E OF FACIN OF ODL SP	eties.						

* Indicator Status utilizes 2016 NWPL

WETLAND DETERMINATION DATA FORM - Eastern Mountains and Piedmont Region

المل 🕪

DP-5

Verlagkor(s) Scan Murray Section, Tournelly, Barge: NA dordigion bittless, energy, energy, Data Standard, Marka 120, Local field (increas, cores, energy, energy, 27.373135, Data WWI Clossifie: Upland, WWI	pplicant/Owner:	National P	ark Service				State:	Kentucky	Samplin	g Point:	DP-5
Inform Network Stope (N): Advance Note: Under Stope (N): Advance Note: Note	vestigator(s):	Sean Mur	ay			Section	, Townshi	ip, Range:	NA		
bingtion (Link or MLRA): Lit: 37.138451 Long: -7.737315 Dotum: WGSBA bingtion: Constrained Link or MLRA 120A Lit: 37.184851 Long: -7.737315 Dotum: WGSBA bingtion: Mark Of Finderson in the tite typical for this one of year? Yes (if no. explain in Remark) Nom of Constraints acce? Yes v legistation: Solid or Hydrology naturally problematics? Yes (if no. explain in Remark) (if no. explain in Remark) MURARY OF INDINGS - Attack site map showing sample point locations, transects, important features, etc. MO Is This Sample Area Within a Wetland? NO mark: Deer orne parameters lacking. Area is not a wetland. Data point located on gentle hillslope. Area consists of a regularly maintained lawn with turf grass and weedy species. VDROLOGY Eetind Hydrology Indicators: Secondary Indicators (Intrimum of two required) Sufficience: Sufficience: Sufficience: Sufficience: Secondary Indicators (Intrimum of two required) Sufficience: NO Depth (Intred): Sufficience: Suffici	ndform (hillslope, ter	errace, etc.):	Terrace			Local relief	(concave, co	nvex, none):	Convex	Slope (%):	3-5
Map Unit: Cardrange site loans, 21 to Spreed alopse ethanchythologic conditions on the stripcid. To this time of yax? Yes (If no, explain in Remarks) Winst (Cronstances ?) Yes Yes ethanchythologic conditions on the application in Remarks) Monal (From Streent?) Yes (If no, explain in Remarks) Winst (Cronstances ?) Yes (If no, explain in Remarks) Winst (Cronstances ?) Yes (If no, explain in Remarks) Vinst (Cronstances ?) Yes (If no, explain in Remarks) Vinst (Cronstances ?) Yes Vinst (Cronstances ?) Yes Vinst (Cronstances ?) Yes Vinst (Cronstances ?) Yes Vinst (Cronstances ?) Vinst (Cronstances ?) <th>bregion (LRR or</th> <th>MLRA):</th> <th>LRR N; MLRA</th> <th>120A</th> <th>Lat:</th> <th>37.184851</th> <th></th> <th>Long:</th> <th>-77.373135</th> <th>Datum:</th> <th>WGS84</th>	bregion (LRR or	MLRA):	LRR N; MLRA	120A	Lat:	37.184851		Long:	-77.373135	Datum:	WGS84
e amarting microarding conduction on the site typical hor this time of years (1997) Test (1997) (The deed, epoint in Amarting and a set (1997) (The epoint of the set (1997) (The epoint (il Map Unit:	Clarkrange	e silt loam, 2 to	o 6 percent slopes		-	.,	4.5		NWI Classif.:	Upland
Vegetation. Solid in Phylology signification (Solid Constraints) (Solid Constraints) (Constraints) (Constrain	e climatic/nydroid	or Hydrold	ons on the site	typical for this tim	ie of ye	are	Yes	(if no, e	xpiain in Remarks.) ormal Circumstancoc?	Vee
	e Vegetation, Soll,	, or Hydrold	ogy significanti	y disturbed?	NO					ormal Circumstances?	Yes
UMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc. ydic Soil Present? NO etaida Mydrology Present? NO marks: De or more parameters lacking. Area is not a wetland. Data point located on gentle hillslope. Area consists of a regularly maintained lawn with turf grass and weedy species. YDROLOGY etaida Mydrology indicators: imary indicators (minimum of two regured) Suffex Ware Table (22) Apple and the apply indicators (minimum of two regured) Suffex Ware Table (22) The Aquatic Plant (31) Suffex Ware Table (22) Prevent ware (13) Order and mydrology indicators (minimum of two regured) Suffex Ware Table (22) Prevent ware (13) Ware Table (22) Prevent ware (13) Order and mydrology indicators (13) Derive and Ware Table (22) Suffex Ware Table (22) Ware Table (23) Order and mydrology indicators (13) Derive and Ware Table (24) The Aquatic Plant (31) Ware Stande (14) Microboggraphic Reset Plant (22) Microboggraphic Reset Plant (23) <td< td=""><td>e vegetation, son,</td><td></td><td>igy naturally p</td><td>robiematic:</td><td>NO</td><td></td><td></td><td></td><td></td><td>eeded, explain any ans</td><td>swers in Remai</td></td<>	e vegetation, son,		igy naturally p	robiematic:	NO					eeded, explain any ans	swers in Remai
Jordport Is This Sample Area Within a Wetland? NO marks: Data point located on genite hillslope. Area is not a wetland. Data point located on genite hillslope. Area is not a wetland. Data point located on genite hillslope. Area is not a wetland. Data point located on genite hillslope. Area consists of a regularly maintained lawn with turf grass and weedy species. VPROLOGY Etland Hydrology Indicators: Surface Soll Crack (0) Dott probability Arigh Mori Crack (0) Inundation Was Urack (1) Inundation Was On Arial (0) Water Present? NO Depth (Inches): Surface Soll Crack (0) Inundation Was On Arial (0) Inundation Was On Arial (0) Inundation Was On Arial (0)	UMMARY OF F	INDING	5 - Attach si	te map showin	ig sam	ple point l	ocations	s, transeo	cts, important	features, etc.	
Data and hydrology Present? Dot Concerner parameters lacking. Area is not a wetland. Data point located on gentle hills/ope. Area consists of a regularly maintained lawn with turf grass and weedy species. VPROLOCY Secondary Indicators (minimum of one is required; check all that apply) Secondary Indicators (minimum of two required) Surface Water (All) Aquatic Fama (B3) Surface Surface (B6) High Water Table (A2) True Aquatic Fama (B3) Surface Surface (B6) Surface Water (All) Outspoint (B2) Dreame (B3) Surface Surface (B6) Dreame (B7) Surface Surface (B6) Surface Surface (B6) Dreame (B7) Surface Surface (B6) Surface Surface (B7) Dreame (B7) Dreame (B7) Surface Surface (B7) Dreame (B7) Surface Surface (B7) Surface Surface (B7) Dreame (B7) Dreame (B7) Surface Surface (B7) Dreame (B7) Surface Surface (B7) Surface Surface (B7) Dreame (B7) Surface Surface (B7) Surface Surface (B8) Dreame (B7) Surface Surface (B7) Surface Surface (B8) Dreame (B7) Surface Surface (B7) Surface Surface (B8) Dreame (B7) Surface Surface (B7)	ydrophytic Vegetai	tion Presen	t?	NO				lc.	This Sample Area	Within a Wotland?	NO
One or more parameters lacking. Area is not a wetland. Data point located on gentle hillsidge. Area consists of a regularly maintained lawn with turf grass and weedy species. WDROLOGY VERIAR Hydrology Indicators: imary Indicators (ininium of etwo required). Surface 300 Crack (8): Surface 300 Crack (8)	Vetland Hydrology I	Present?						15	This Sample Alea		
Open Control Secondary Indicators: immay Indicators (minimum of its required; check all that apply) Secondary Indicators (minimum of two required) Surface Water (A1) Aquatic Fauna (B13) Surface Sol (Cracks (B6) Surface Water (A1) Aquatic Fauna (B13) Surface Sol (Cracks (B6) Surface Water (A1) Most Nata (B13) Object Reduced Tom (C1) Most Nata (B13) Surface Sol (Cracks (B6) Surface Sol (Cracks (B6) Surface Sol (Cracks (B6) Surface Sol (Cracks (B6) Surface Sol (Cracks (B6) Surface Sol (Cracks (B6) Surface Sol (Cracks (B6) Most Nata (B13) Most Nata (B13) Most Nata (B13) Orth Depotes (B2) Presence of Reduced Tom (C1) Most Nata (C1) Surface Sol (Cracks (B6) Apple Mater Chart (B4) This Mack Surface (C7) Surface Sol (Cracks (B6) Surface Sol (Cracks (B7) Intro Deposits (B2) This Mack Surface (C7) Mo Surface (C1) Surface Sol (Cracks (B7) Intro Deposits (B2) This Mack Surface (C7) Most Surface (C2) Surface Sol (Cracks (B7) Surface Sol (Cracks (B7) Introde Water Present? NO Depth (Inches): 2.8 Wetland Hydrology Present? NO	emarks:	One or m Data poir	ore paramet nt located on	ers lacking. Area gentle hillslope.	is not Area o	a wetland. consists of a	regularly	maintain	ed lawn with tur	f grass and weedy sp	oecies.
eteland Hydrology Indicators: imary Indicators (iminium of nois is required; check all that apply) Secondary Indicators (iminium of two required) Surface Water (A1) Aquatic Fanua (B13) Surface Costs (86) Surface Water (A1) Aquatic Fanua (B13) Dariage Pattern (\$10) Sturbal (A1) Doubled Nitroophers on Lining Roots (C1) Dorsaes Matter (\$10) Sturbal (B1) Doubled Nitroophers on Lining Roots (C1) Dory-Season Water Table (C2) Drift Deposits (B2) Presence of Reduced too (C4) Dory-Season Water Table (C2) Drift Deposits (B2) Presence of Reduced too (C4) Corpris Burrows (C8) Iron Deposits (B2) Detext (Ino Reducing Ino Inited Solis (C6) Sturtation Visible on Arrail Imagery (C3) Iron Deposits (B3) Other (Explain in Remarks) Scorport (C1) Sturation Visible on Arrail Imagery (C3) Water State Recorded Data (stream guage, monitoring weight, inches): <u>118</u> 218 Wetland Hydrology Present? NO OIL Scorport (Inches): <u>128</u> 128 Wetland Hydrology Present? NO Scorport (Inches): <u>128</u> 257 757 	YDROLOGY										
imary Indicators (minimum of one is required; check all that apply) Surface Water (A1) August Faura (B13) Surface Water (A1) The Aquater Paura (B13) Surface Water (A1) Staturation (A3) Hydrogens Sufface Oddr (C1) Moas Time Lines (B6) Water Marks (B1) Oxidiced Rhitosopheres on Lining Roots (C2) Oxyssaon Water Table (A2) Sediment Deposits (B3) Presence of Reduced on (C4) Cors/sh Baruration Visible on Areal (C3) Staturation (Casta (B4) Thin Muck Surface (C7) Staturation Visible on Areal (C3) Irron Deposits (B3) Other (Explain in Remarks) Staturation Visible on Areal (C4) Irron Deposits (B3) Other (Explain in Remarks) Wetland Hydrology Present? NO Ied Observations: O Depth (Inches): O NO Stort de of Strass of Mark (D3) Present? NO Depth (Inches): NO Stort de of Strass of Mark (D3) Present? NO Depth (Inches): O Stort de of Strass of Mark (D3) Present? NO Depth (Inches): Stort de of Strass of Mark (D4) Idro Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.) Indicators of Problematic Hydric Soils? NO	etland Hydrology	Indicators:							Secondary Indic	ators (minimum of two	o required)
Surface Water (A1) Aquite Fame (B3) Superset (A2) True (Aquite Fame (B3) High Water Table (A2) True (Aquite Fame (B1) Drainage Patterns (B1) Starutation (A3) Hydrogen Sulfac Odor (C1) More Marks (B1) Water Marks (B1) Doubled Bhitospheres on Living Roots (C3) Dry-Season Water Table (C2) Starutation (A3) Hydrogen Sulfac Odor (C1) More Marks (B1) Onth Deposits (B2) Presence of Reduced from (C4) Dry-Season Water Table (C2) Appl Mater Cruit (B4) Trin Muck Surface (C7) Starutation Valible on Aerial (B7) Irron Deposits (B3) Depth (Inches): 0 Marker Table Freent? NO Depth (Inches): 13 Mater Table Freent? NO Depth (Inches): 14 Water Table Freent? NO Depth (Inches): 14 Mater Table Freent? NO Depth (Inches): 14 Mater Table Freent? NO Depth (Inches): 15 Mater Table Freent? NO Depth (Inches): 16 Mater Table Freent? NO Depth (Inche	imary Indicators (r	minimum o	f one is requir	ed; check all that a	pply)				Surfa	ace Soil Cracks (B6)	
High Water Table (A2) The Aquater Plants (B14) Online (B16) Water Marks (B1) Outdided Rhizopheres on Living Roots (C1) Most Time Lines (B16) Water Marks (B1) Outdided Rhizopheres on Living Roots (C2) Dryssaon Water Table (A2) Seldiment Doposits (B2) Presents on Reduction in Tilled Solis (C6) Saturation Visible on Arrail (D2) Ord Doposits (B3) Recent tran Reduction in Tilled Solis (C6) Saturation Visible on Arrail (D2) Imandation Visible on Arrail (D1) Other (Explain in Remarks) Genorophic Relief (D4) Imarks: NO Depth (Inches): <u>318</u> Wetland Hydrology Present? NO Idd Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.) Peth (Inches): <u>318</u> Vetland Hydrology Present? NO OIL Color (moist) <u>%</u> <u>5</u> <u>7</u> , <u>7</u> , <u>7</u> , <u>8</u> , <u>7</u>	Surface Water	(A1)		Aquatic Fau	na (B13)				Spar	sely Vegetated Concave	Surface (B8)
Image: Structure (A3) Hydrogen Sulface Odor (C1) Mos Trim Lines (B1) Swater Marks (B1) Oxidice Mixosophics on Luing Roots (C3) Day Season Wate Table (C2) Sediment Deposits (B2) Presence of Reduced Iron (C4) Craylish Burrows (C8) Jorit Deposits (B3) Recent Iron Reducino in Titled Solis (C6) Saturation Visible on Aerial Imagery (C2) Hond Data (B4) Thin Muck Surface (C7) Saturation Visible on Aerial Imagery (C3) Imundation Visible on Aerial (B7) Other (Explain in Remarks) Geomorphic Position (D2) Water Table Present? NO Depth (inches): >18 Secorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: moticators.) epth Matrix Redox Features Color (moist) % Type ¹ Loc ² Texture Remarks 56 107 K8 J2 95 7.57K 8 J4 5 C moticators.) Indicators for Problematic. Hydric Solls ² : Histoc Dippetion. (Descr	High Water Tal	ble (A2)		True Aquatio	c Plants	(B14)			Drai	nage Patterns (B10)	
Water Marks (B1) Oxidized Rhitospheres on Lining Roots (C3) Dry-Season Water Table (C2) Sediment Deposits (B3) Recent ron Reduction in Titled Soils (C6) CrayRish Instructs (C1) Aga Mator Crost (B4) Thin Muck Surface (C7) Sturation Visible on Aerial Imagery (C9) Imarkition Visible on Aerial (B7) Other (Explain in Remarks) Microtopargabic Relief (D4) Imarkition Visible on Aerial (B7) Other (Explain in Remarks) Microtopargabic Relief (D4) Vater Stained Leaves (B9) Thin Muck Surface (C7) Microtopargabic Relief (D4) Yater Stained Leaves (B9) Depth (inches): <u>J8</u> Wetland Hydrology Present? NO Depth (inches): J8 Visitation Present? NO Depth (inches): J8 Vetland Hydrology Present? NO Petht (Inches): J8 Visitation Present? NO Depth (Inches): J8 Vetland Hydrology Present? NO Petht (Inches): J8 Visitation Present? NO Depth (Inches): J8 Vetland Hydrology Present? NO Petht (Inches): J8 Visitation Present? N	Saturation (A3))		Hydrogen Su	ulfide Oc	lor (C1)			Mos	s Trim Lines (B16)	
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Drift Deposits (B3) Recent from Reduction in Tilled Solis (C6) Saturation Visible on Aerial Imagery (C3) Algal Matr Occust (B4) Dithin Muck Sufface (C7) Sturation Visible on Aerial Imagery (C3) Inonation Visible on Aerial (B7) Dithin Remarks) Geomorphic Position (D2) Inonation Visible on Aerial (B7) Dithin Remarks) Geomorphic Position (D2) Indicator State Table Present? NO Depth (Inches): -318 Vectoration Present? NO Depth (Inches): -318 Vectoration Present? NO Depth (Inches): -318 escribe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: marks: No primary or secondary indicators of wetland hydrology present; parameter is not met. OIL Oil Color (moist) % Type ¹ Loc ² Texture Remarks 64 10YR 3/2 95 7.5YR 3/4 5 c p Ioayloam	Sediment Depo	osits (B2)		Presence of	Reduce	d Iron (C4)			Cray	fish Burrows (C8)	
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estrictive Layer (if observed): Type: Depth (inches):	Vater Prese Vater Table Present aturation Present? Vescribe Recorded D Vescribe Record	ent? t? Data (streau No prima (Describe to Matrix moist) 3/2 4/3 D=Depletion, F rs: n (A2) 3) ide (A4) rs (A5) 0) w Dark Surfa face (A12) Wineral (S1) Matrix (S4) S5)	NO NO NO m gauge, moni ry or seconds o the depth ne 95 90 	EDepth (in Depth (in Depth (in Toring well, aerial p ary indicators of eded to document Color (moist 7.5YR 3/4 10YR 3/6 	ains.	0 >18 >18 previous inspe- ind hydrology dicator or conf dox Features % 5 10 e (S7) elow Surface (S8) elow Surface (S9) ed Matrix (F2) atrix (F3) Surface (F6) rk Surface (F6) rk Surface (F7) esse Masses (F1 ace (F13) podplain Soils (F	ections), if present; firm the al Type ¹ c c c c c c c c c c c c c	We f available: paramete bsence of ir Loc ² p m	etland Hydrology P er is not met. dicators.) Texture clay loam clay loam clay loam clay loam clay	resent?	NO Remarks
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VEGETATION - Use scientific names of plants.



	Absolute	Dom.	Indicator			
Tree Stratum (Plot size: 30' radius)	% Cover	Sp?	Status*	Dominance Test Worksheet:	0	(A)
2		·		# Dominants OBL, FACW, FAC.		(A)
3.				# Dominants across all strata:	2	(B)
4					0%	(4 (0)
5		·		[%] Dominants OBL, FACW, FAC.		(A/ b)
7.				Prevalence Index Worksheet:		
		= Tota	l Cover	Total % Cover of:	Multiply By	y:
Sapling Stratum (Plot size: 30' radius)				OBL x1	=	
1.		·		FACW x2	=	
2.	·	·			- 176	
4.		·		UPI 63 x5	= 170	
5.				Sum: 107 (A)	491	(B)
6.						
7	·			Prevalence Index = B/A	4 = 4.59	
		= Tota	l Cover	Hydrophytic Vegetation Indicator	rs:	
Shrub Stratum (Plot size: 15' radius)				Dominance Test is > 5	50%	
1				Prevalence Index is <	= 3.0	
2				Problematic Hydroph	vytic Vegetation ¹ (explain)
3				Rapid Test for Hydrop	phytic Vegetation	
4.	·	·		Morphological Adapt	ations	
5	·	·		¹ Indicators of hydric soil and wetland hydr	rology must be present	t, unless
7.	·			Definitions of Vegetation Strata:		
		= Tota	l Cover			
Herb Stratum (Plot size: 10' radius)				Tree - Woody plants, excluding woody vi	nes, approximately 20 ⁴	ft (6m) or
1. Lespedeza repens	63	Х	UPL	more in height and 3in (7.6cm) or larger in	ı diameter at breast he	eight (DBH).
2. Poa pratensis	38	Х	FACU			
3. Iritolium repens	3	·	FACU	Sanling Weedu plante such ding weed		· 20ft (Cm)
4. riagana virginiana		·	FACU	or more in height and less than 3in (7.6cm	i) DBH.	y 2011 (6111)
6.	,	·				
7.	·					
8.				Shrub - Woody plants, excluding woody	vines, approximately	3 to 20ft (1
9				to 6m) in height.		
10	·	·		Uzek an i z i i i		
12	·			regardless of size. Includes woody plants,	except woody vines, le	us vines, ess than
12.	107	= Tota	Cover	approximately 3ft (1m) in height.		
Woody Vines (Plot size: 30' radius)						
1.						
2.				Woody vine - All woody vines, regardle	ess of height.	
3						
4	·	·		Hydrophytic		
5		_ Tata		Vegetation	NO	
		= 10ta	I Cover	Present?	NU	
Remarks: (If observed, list morphological adaptations below).					
No hydrophytic vegetation indicators present; p	arameter is not met.					

* Indicator Status utilizes 2016 NWPL
| Applicant/Owner: National Park Service State: Ken Investigator(s): Sean Murray Section, Township, R Landform (hillslope, terrace, etc.): Terrace/Hillslope Local relief (concave, convex, Subregion (LRR or MLRA): LRR N; MLRA 120A Lat: 37.184964 Soil Map Unit: Clarkrange silt loam, 2 to 6 percent slopes Are climatic/hydrologic conditions on the site typical for this time of year? Yes (I Are Vegetation, Soil, or Hydrology significantly disturbed? No No Are Vegetation, Soil, or Hydrology naturally problematic? No SUMMARY OF FINDINGS - Attach site map showing sample point locations, traited by the sent? NO No No Subtact All Hydrology Present? NO NO No No No Remarks: One or more parameters lacking. Area is not a wetland. Data point located on gentle hillslope within wood grave near cabins, parameters lacking. No No | ntucky Sampling Point: DP-6 Range: NA Slope (%): 3-5 Long: -77.373135 Datum: WGS84 NWI Classif.: Upland (If no, explain in Remarks.) Normal Circumstances? Yes (If needed, explain any answers in Remark ransects, important features, etc. Is This Sample Area Within a Wetland? NO |
|--|--|
| Sean Murray Section, Township, R andform (hillslope, terrace, etc.): Terrace/Hillslope Local relief (concave, convex, co | NA Slope (%): 3-5 Long: -77.373135 Datum: WGS84 NWI Classif.: Upland (If no, explain in Remarks.) Normal Circumstances? Yes (If needed, explain any answers in Remarks) ransects, important features, etc. Is This Sample Area Within a Wetland? NO |
| andform (hillslope, terrace, etc.): Terrace/Hillslope Local relief (concave, convex, ubregion (LRR or MLRA): LRR N; MLRA 120A Lat: 37.184964 oil Map Unit: Clarkrange silt loam, 2 to 6 percent slopes state re climatic/hydrologic conditions on the site typical for this time of year? Yes (I re Vegetation, Soil, or Hydrology significantly disturbed? No No UMMARY OF FINDINGS - Attach site map showing sample point locations, traydrophytic Vegetation Present? YES ydric Soil Present? NO NO emarks: One or more parameters lacking. Area is not a wetland. Data point located on gentle hillslope within wood grave near cabins, parameters lacking. Area is not a wetland. | c, none): Convex Slope (%): 3-5 Long: -77.373135 Datum: WGS84 NWI Classifi.: Upland (If no, explain in Remarks.) Normal Circumstances? Yes (If needed, explain any answers in Remark (If needed, explain any answers in Remark ransects, important features, etc. Is This Sample Area Within a Wetland? |
| ubregion (LRR or MLRA): LRR N; MLRA 120A Lat: 37.184964 oil Map Unit: Clarkrange silt loam, 2 to 6 percent slopes Image: Slopes are climatic/hydrologic conditions on the site typical for this time of year? Yes (image: Slopes) are Vegetation, Soil, or Hydrology significantly disturbed? No No are Vegetation, Soil, or Hydrology naturally problematic? No No SUMMARY OF FINDINGS - Attach site map showing sample point locations, training the solution of the set ? YES lydrophytic Vegetation Present? YES No Vetland Hydrology Present? NO Deemarks: One or more parameters lacking. Area is not a wetland. Data point located on gentle hillslope within wood grave near cabins, Image: Slope set in the set set set set set set set set set se | Long: Datum: WGS84
NWI Classif.: Upland
(If no, explain in Remarks.)
Normal Circumstances? Yes
(If needed, explain any answers in Remark
ransects, important features, etc.
Is This Sample Area Within a Wetland? NO |
| Clarkrange silt loam, 2 to 6 percent slopes Clarkrange silt loam, 2 to 6 percent slopes re climatic/hydrologic conditions on the site typical for this time of year? Yes (i re Vegetation, Soil, or Hydrology significantly disturbed? No No SUMMARY OF FINDINGS - Attach site map showing sample point locations, tr vdrophytic Vegetation Present? YES vdrind Hydrology Present? NO NO One or more parameters lacking. Area is not a wetland. Data point located on gentle hillslope within wood grave near cabins, parameters lacking | NWI Classif.: Upland (If no, explain in Remarks.) Normal Circumstances? Yes (If needed, explain any answers in Remark (If needed, explain any answers in Remark ransects, important features, etc. Is This Sample Area Within a Wetland? |
| re Vegetation, Soil, or Hydrologic conditions on the site typical for this time of year? Yes (if the vegetation, Soil, or Hydrology significantly disturbed? No re Vegetation, Soil, or Hydrology naturally problematic? No UMMARY OF FINDINGS - Attach site map showing sample point locations, tr ydrophytic Vegetation Present? YES ydric Soil Present? NO retaind Hydrology Present? NO mo mo one or more parameters lacking. Area is not a wetland. Data point located on gentle hillslope within wood grave near cabins, p | (If no, explain in Remarks.)
Normal Circumstances? <u>Yes</u>
(If needed, explain any answers in Remark
ransects, important features, etc.
Is This Sample Area Within a Wetland? <u>NO</u> |
| No Vegetation, Soil, or Hydrology significantly disturbed? No VUMMARY OF FINDINGS - Attach site map showing sample point locations, tr ydrophytic Vegetation Present? YES ydric Soil Present? NO retland Hydrology Present? NO one or more parameters lacking. Area is not a wetland. Data point located on gentle hillslope within wood grave near cabins, parameters lacking. | (If needed, explain any answers in Remar
ransects, important features, etc.
Is This Sample Area Within a Wetland? <u>NO</u> |
| UMMARY OF FINDINGS - Attach site map showing sample point locations, tr ydrophytic Vegetation Present? YES ydric Soil Present? NO /etland Hydrology Present? NO emarks: One or more parameters lacking. Area is not a wetland. Data point located on gentle hillslope within wood grave near cabins, parameters lacking. | ransects, important features, etc. Is This Sample Area Within a Wetland? NO |
| UMMARY OF FINDINGS - Attach site map showing sample point locations, tr
lydrophytic Vegetation Present? YES
lydric Soil Present? NO
Vetland Hydrology Present? NO
Iemarks: One or more parameters lacking. Area is not a wetland.
Data point located on gentle hillslope within wood grave near cabins, p | ransects, important features, etc.
Is This Sample Area Within a Wetland? NO |
| Ivdrophytic Vegetation Present? YES
Ivdric Soil Present? NO
Vetland Hydrology Present? NO
No
Demarks: One or more parameters lacking. Area is not a wetland.
Data point located on gentle hillslope within wood grave near cabins, p | Is This Sample Area Within a Wetland? NO |
| Vetland Hydrology Present? NO
emarks: One or more parameters lacking. Area is not a wetland.
Data point located on gentle hillslope within wood grave near cabins, p | |
| temarks: One or more parameters lacking. Area is not a wetland.
Data point located on gentle hillslope within wood grave near cabins, | |
| Data point located on gentle hillslope within wood grave near cabins, | |
| | parking lots, and gravel roads. |
| IYDROLOGY | |
| /etland Hydrology Indicators: | Secondary Indicators (minimum of two required) |
| rimary Indicators (minimum of one is required; check all that apply) | Surface Soil Cracks (B6) |
| Surface Water (A1) Aquatic Fauna (B13) | Sparsely Vegetated Concave Surface (B8) |
| High Water Table (A2) True Aquatic Plants (B14) | Drainage Patterns (B10) |
| Saturation (A3) Hydrogen Sulfide Odor (C1) | Moss Trim Lines (B16) |
| Water Marks (B1) Oxidized Rhizospheres on Living Roots (C3) | Dry-Season Water Table (C2) |
| Sediment Deposits (B2) Presence of Reduced Iron (C4) | Crayfish Burrows (C8) |
| Drift Deposits (B3) Recent Iron Reduction in Tilled Soils (C6) | Saturation Visible on Aerial Imagery (C9) |
| Algal Mat or Crust (B4) Thin Muck Surface (C7) | Stunted or Stressed Plants (D1) |
| Iron Deposits (B5) Other (Explain in Remarks) | Geomorphic Position (D2) |
| Inundation Visible on Aerial (B7) | Microtopographic Relief (D4) |
| water-standu Leaves (B9) | |
| ield Observations: | |
| Water Table Present? NO Depth (Inches): 0 | Wotland Hydrology Present? |
| aturation Present? NO Depth (inches): >18 | wetiand Hydrology Present? NO |
| Provide Depended Date (stream any manifering well equip the tag manifering well) | ailahlar |
| | rameter is not met. |
| | rameter is not met. |
| OIL
rofile Description: (Describe to the depth needed to document the indicator or confirm the absence
repth Matrix Redox Features | rameter is not met. |
| GOIL rofile Description: (Describe to the depth needed to document the indicator or confirm the absence to the depth | rameter is not met. |
| OIL
rofile Description: (Describe to the depth needed to document the indicator or confirm the absen-
lepth <u>Matrix Redox Features</u>
(in) <u>Color (moist) % Color (moist) % Type¹ Lo
0-18 2.5Y 4/4 100</u> | rameter is not met.
ice of indicators.)
.oc ² Texture Remarks
Ioam |
| OIL
rofile Description: (Describe to the depth needed to document the indicator or confirm the absen-
tepth <u>Matrix Redox Features</u>
(in) <u>Color (moist) % Color (moist) % Type¹ Lo
0-18 2.5Y 4/4 100</u> | rameter is not met.
here of indicators.)
.oc ² Texture Remarks
loam |
| OIL rofile Description: (Describe to the depth needed to document the indicator or confirm the absen repth Matrix Redox Features (in) Color (moist) % Color (moist) % Type ¹ Lo D-18 2.5Y 4/4 100 | rameter is not met. ice of indicators.) .oc ² Texture Remarks Ioam |
| OIL rofile Description: (Describe to the depth needed to document the indicator or confirm the absen epth Matrix Redox Features (in) Color (moist) % Color (moist) % Type ¹ Lo D-18 2.5Y 4/4 100 | rameter is not met. here of indicators.) .oc ² Texture Remarks Ioam |
| OIL rofile Description: (Describe to the depth needed to document the indicator or confirm the absen epth Matrix Redox Features (in) Color (moist) % Color (moist) % Type ¹ Lo D-18 2.5Y 4/4 100 | rameter is not met. |
| OIL rofile Description: (Describe to the depth needed to document the indicator or confirm the absen epth Matrix Redox Features (in) Color (moist) % Color (moist) % Type ¹ Lo D-18 2.5Y 4/4 100 ype: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. | rameter is not met. |
| OIL rofile Description: (Describe to the depth needed to document the indicator or confirm the absen
tepth Matrix Redox Features (in) Color (moist) % Color (moist) % 0-18 2.5Y 4/4 100 | rameter is not met. |
| GOIL Tofile Description: (Describe to the depth needed to document the indicator or confirm the absen bepth Matrix Redox Features (in) Color (moist) % Color (moist) % Color (moist) % Type ¹ Lo 0-18 2.5Y 4/4 100 | rameter is not met. |
| SOIL trofile Description: (Describe to the depth needed to document the indicator or confirm the absen Depth Matrix Redox Features (in) Color (moist) % Color (moist) % 0-18 2.5Y 4/4 100 | rameter is not met. |
| SOIL Trypil Description: (Describe to the depth needed to document the indicator or confirm the absen pepth Matrix Redox Features (in) Color (moist) % Type ¹ Lo 0-18 2.5Y 4/4 100 % Color (moist) % Type ¹ Lo 0-18 2.5Y 4/4 100 | rameter is not met. |
| GOIL rofile Description: (Describe to the depth needed to document the indicator or confirm the absen pepth Matrix Redox Features (in) Color (moist) % Color (moist) % Color (moist) 0-18 2.5Y 4/4 100 100 100 100 110 100 100 1100 100 100 1100 100 100 1100 100 100 1100 100 100 1100 100 100 1100 100 100 1100 100 100 1100 100 100 1100 100 100 1100 100 100 1100 100 100 1100 100 100 1100 100 100 1100 100 100 11000 100 100 11000 100 100 11000 100 100 11000 <t< td=""><td>rameter is not met.</td></t<> | rameter is not met. |
| OIL rofile Description: (Describe to the depth needed to document the indicator or confirm the absen repth Matrix Redox Features (in) Color (moist) % Type ¹ Lt D-18 2.5Y 4/4 100 % Color (moist) % Type ¹ Lt D-18 2.5Y 4/4 100 % Color (moist) % Type ¹ Lt D-18 2.5Y 4/4 100 % Color (moist) % Type ¹ Lt D-18 2.5Y 4/4 100 % Color (moist) % Type ¹ Lt D-18 2.5Y 4/4 100 % Color (moist) % Type ¹ Lt O-18 2.5Y 4/4 100 % Color (moist) % Type ¹ Lt % Color (moist) % Color (moist) % Type ¹ Lt % Color (moist) % Color (moist) % Type ¹ Lt % Color (moist) % Color (moist) % Type ¹ Lt | rameter is not met. |
| GOIL rofile Description: (Describe to the depth needed to document the indicator or confirm the absen pepth Matrix Redox Features (in) Color (moist) % Color (moist) % Color (moist) % Type ¹ Lo 0-18 2.5Y 4/4 100 | rameter is not met. |
| GOIL rofile Description: (Describe to the depth needed to document the indicator or confirm the absen Vepth Matrix Redox Features (in) Color (moist) % Type ¹ Lo 0-18 2.5Y 4/4 100 % Color (moist) % Type ¹ Lo 0-18 2.5Y 4/4 100 | rameter is not met. |
| SOIL rofile Description: (Describe to the depth needed to document the indicator or confirm the absen Depth Matrix Redox Features (in) Color (moist) % Type ¹ Lo 0-18 2.5Y 4/4 100 % % % % 0-18 2.5Y 4/4 100 %< | rameter is not met. |
| SOIL Trofile Description: (Describe to the depth needed to document the indicator or confirm the absen pepth Matrix Redox Features (in) Color (moist) % Type ¹ Lo 0-18 2.5Y 4/4 100 | rameter is not met. |
| SOIL Trofile Description: (Describe to the depth needed to document the indicator or confirm the absen pepth Matrix Redox Features Depth Matrix Redox Features (in) Color (moist) % Type ¹ Lo 0-18 2.5Y 4/4 100 | rameter is not met. |
| SOIL Trofile Description: (Describe to the depth needed to document the indicator or confirm the absen pepth Matrix Redox Features (in) Color (moist) % Type ¹ Lot 0-18 2.5Y 4/4 100 | rameter is not met. |
| SOIL Tropile Description: (Describe to the depth needed to document the indicator or confirm the absen bepth Matrix Redox Features (in) Color (moist) % Type1 Lt 0-18 2.5Y 4/4 100 % Type1 Lt 0-18 2.5Y 4/4 100 | rameter is not met. |
| GOIL rofile Description: (Describe to the depth needed to document the indicator or confirm the absen hepth Matrix Redox Features Matrix Redox Features (in) Color (moist) % Type ¹ Lt Old (moist) % Old (moist) % % | rameter is not met. |
| SOIL rrofile Description: (Describe to the depth needed to document the indicator or confirm the absen Depth Matrix Redox Features (in) Color (moist) % Type ¹ Lo 0-18 2.5Y 4/4 100 % Type ¹ Lo 0 Color (moist) % Type ¹ Lo 0 Color (moist) % Type ¹ Lo 0 Color (moist) % % | rameter is not met. |
| SOIL Profile Description: (Describe to the depth needed to document the indicator or confirm the absen Depth Matrix Redox Features (in) Color (moist) % Color (moist) % Type ¹ Color (moist) % Color (moist) % Type ¹ 0.18 2.5Y 4/4 100 Supervision of the depth needed to document the indicator or confirm the absen Depth Matrix Redox Features (in) Color (moist) % Type ¹ Le 0.18 2.5Y 4/4 100 Matrix Redox Features (In) Color (moist) % Color (moist) % Type ¹ Le On 10 Type 1 Le Image: Color (moist) % Type ¹ Color (moist) % Type ¹ Le Image: Color (moist) % Type ¹ Le Image: Color (moist) % Type ¹ Le Image: Color (moist) Type: Color (moist) Type: Color (moist) Type: Color (moist) Type: Color (moist) <th< td=""><td>rameter is not met.</td></th<> | rameter is not met. |



	Absolute	Dom.	Indicator			
Tree Stratum (Plot size: 30' radius)	% Cover	Sp?	Status*	Dominance Test Worksheet:	• • • •	
1. Ulmus rubra	63	<u> </u>	FAC	# Dominants OBL, FACW, FAC:	<u> </u>	
2. Fraxinus quadrangulata	15	·	UPL			
3.		·		# Dominants across all strata:	(B)	
4		·			750/ / / /	(D)
5.		·		% Dominants OBL, FACW, FAC:	/5% (A/	B)
б		·		Describer as to deve W/s which s at:		
<i>I.</i>				Prevalence Index Worksneet:		
Carling Charter (Distring)	/8	= 10ta	Cover	Total % Cover of:	минтру ву:	
Sapling Stratum (Plot size: 50 radius)	45	v	FAC			
	15		FAC	FACV $X Z =$	249	
2.		·		FAC 110 $x_3 =$	176	
3.		·		FACU <u>44</u> X4 =	75	
4		·		Sum: 175 (A)	500 (P)	
5		·		Sum. 175 (A)	333 (B)	
0		·		Prevalence Index = R/A =	3 / 2	
/		·			5.42	
	15	- Tota	Cover	Hydrophytic Vegetation Indicators:		
Shruh Stratum (Plot size: 15' radius)		- 1018		$\mathbf{Y} \qquad \text{Dominance Test is } 50\%$		
1 Ulmus rubra	38	x	FAC	Prevalence Index is <= 3	n	
2		<u> </u>		Problematic Hydrophytic	Vegetation ¹ (evoluin)	
3		·		Banid Test for Hydrophydd		
۵. 		·		Morphological Adaptatio	ins	
5.		·				
6.	·	·		¹ Indicators of hydric soil and wetland hydrolog disturbed or problematic	y must be present, unless	
7.		·		Definitions of Vegetation Strata:		
····	38	= Tota	l Cover			
Herb Stratum (Plot size: 10' radius)				Tree - Woody plants, excluding woody vines,	approximately 20ft (6m) o	or
1. Chasmanthium latifolium	38	х	FACU	more in height and 3in (7.6cm) or larger in diar	neter at breast height (DE	3H)
2. Parthenocissus guinguefolia	3		FACU			
3. Polystichum acrostichoides	3		FACU			
4.				Sapling - Woody plants, excluding woody vin	es, approximately 20ft (6	m)
5.		·		or more in height and less than 3in (7.6cm) DB	н.	
6.		·				
7.		·				
8.		·		Shrub - Woody plants, excluding woody vine	s, approximately 3 to 20ft	: (1
9.				to 6m) in height.		
10.						
11.				Herb - All herbaceous (non-woody) plants, in	cluding herbaceous vines	,
12.				regardless of size. Includes woody plants, except	ot woody vines, less than	
	44	= Tota	l Cover	approximately 3ft (1m) in height.		
Woody Vines (Plot size: 30' radius)						
1						
2.				Woody vine - All woody vines, regardless or	f height.	
3.						
4				Hydrophytic		
5.				Vegetation		
		= Tota	l Cover	Present?	YES	
Remarks: (If observed, list morphological adaptations below).						

Indicator 2 (Dominance Test) present with >50% of dominant species across all vegetation strata FAC or wetter.

- Who	WE	TLAND DETI	RMINATION DAT		Eastern	iviounta	ins and	Pleamont Re	gion	DP-7
Project Site:	Mammoth (Caves NP	(City/County:	Edmonso	on County			Samp. Date: 10	/1/2018
Applicant/Owner:	National Pa	rk Service		,,,- <u>-</u>	State:	Kentucky		Sampling Point:	D	P-7
Investigator(s):	Sean Murra	y		Section	, Townshi	p, Range:	NA			
Landform (hillslope, t	terrace, etc.):	Terrace		Local relief	(concave, co	nvex, none):	Convex		Slope (%):	0-2
Subregion (LRR or	r MLRA):	LRR N; MLRA 1	20A Lat:	37.185921		Long:	-77.3731	35	Datum:	WGS84
Soil Map Unit:	Clarkrange s	ilt loam, 2 to 6	percent slopes					<u> </u>	NWI Classif.:	Upland
Are climatic/hydro	logic condition	is on the site ty	pical for this time of yea	ir?	Yes	(If no, e	xplain in F	emarks.)		
Are Vegetation, So	il, or Hydrolog	y significantly d	Isturbed? No					Normal Cir	cumstances?	Yes
Are vegetation, so	ii, or Hydrolog	y naturally proc	No No				_	(il needed, e	xplain any answe	ers in Remarks.)
		Attach site	man showing sam	nla naint l	ocations	transor	tc imn	ortant foature	as atc	
JUNIVIANT OF	FINDING3 -			pie point i		s, transet	lis, impo		25, 210.	
Hydric Soil Present	outon Present?		NO			le ⁻	Thic Sami	le Arez Within	a Wetland?	NO
Wetland Hydrology	.: v Present?					13	inis sang			
Remarks:	One or mo	re parameters	lacking. Area is not	a wetland.						
	Data point	located on hi	ltop. Area consists o	f a regularly	r maintair	ned lawn v	vith turf	grass and weed	y species.	
HYDROLOGY										
Wetland Hydrology	y Indicators:				-		Seconda	ary Indicators (mi	inimum of two re	equired)
Primary Indicators	(minimum of o	one is required;	check all that apply)					Surface Soil Cr	racks (B6)	
Surface Wate	er (A1)	_	Aquatic Fauna (B13)		_			Sparsely Vege	tated Concave Sur	face (B8)
High Water T	able (A2)		True Aquatic Plants (B14)				Drainage Patte	erns (B10)	
Saturation (A	3)		Hydrogen Sulfide Od	or (C1)	-+- (00)			Moss Trim Lin	es (B16)	
Water Marks	; (B1)	_	Oxidized Rhizosphere	es on Living Ro	ots (C3)			Dry-Season W	ater Table (C2)	
Seaiment De	posits (B2)		Presence of Reduced	n in Tilled Coll	((6)			Crayfish Burro	ible on Acricl Im	on (CP)
Algal Mat or i	S (BS) Crust (BA)	_	Thin Muck Surface (C	7)	s (CO)			Stunted or Str	ossod Plants (D1)	ery (C9)
Iron Denosits	(B5)		Other (Explain in Ren	narks)				Geomorphic P	osition (D2)	
Inundation Vi	isible on Aerial (B7)		iunoj				Microtopogra	phic Relief (D4)	
Water-Staine	ed Leaves (B9)	,						FAC-Neutral T	est (D5)	
Field Observations										
Surface Water Pres	sent?	NO	Denth (inches):	0						
Water Table Prese	nt?	NO	Depth (inches):	<u> </u>		We	tland Hyd	rology Present?		NO
Saturation Present	?	NO	Depth (inches):	<u></u> 		vve		lology Flesent:		NO
SOIL										
Profile Description	: (Describe to t	he depth need:	ed to document the ind	icator or con	firm the al	osence of in	dicators.)			
Depth	Matrix		Red	ox Features						
(in) Color	(moist)	%	Color (moist)	%	Туре⁺	Loc ²		Fexture	Rei	marks
0-18 10Y	'R 5/3	75	10YR 3/6	25	с	р	C	ay loam		
	<u> </u>									
·······		· · · · · · · · · · · · · · · · · · ·								
·······	· ·	· · · · · · · · · · · · · · · · · · ·								
	<u> </u>									
¹ Type: C=Concentration	D=Depletion RM	=Reduced Matrix, N								
.,,	, b bepietion, nin		IS=Masked Sand Grains.				² Location:	PL=Pore Lining, M=N	latrix.	
Hydric Soil Indicato	ors:		1S=Masked Sand Grains.		· ·		² Location:	PL=Pore Lining, M=N	latrix. ic Hydric Soils ³ :	
Hydric Soil Indicato	ors:		IS=Masked Sand Grains.		·		² Location: Indicato	PL=Pore Lining, M=N rs for Problemat	latrix. ic Hydric Soils ³ :	
Hydric Soil Indicato	ors:		Dark Surface	(\$7)			² Location: Indicato	PL=Pore Lining, M=N rs for Problemat 2 cm Muck (A:	latrix. ic Hydric Soils ³ : 10)	
Hydric Soil Indicato Histosol (A1) Histic Epiped	ors:		Dark Surface Polyvalue Bel	(S7) ow Surface (S8	3)		² Location: Indicato	PL=Pore Lining, M=M rs for Problemat 2 cm Muck (A: Coast Prairie F Biodmont Elec	latrix. ic Hydric Soils ³ : 10) Redox (A16) Odelain Soile (510)	
Hydric Soil Indicato Histosol (A1) Histic Epiped Black Histic (/	on (A2) A3)		Dark Surface Dark Surface Polyvalue Bel Thin Dark Sur	(S7) ow Surface (S8 face (S9)	3)		² Location: Indicato	PL=Pore Lining, M=M rs for Problemat 2 cm Muck (A: Coast Prairie F Piedmont Floc	latrix. ic Hydric Soils ³ : 10) Redox (A16) odplain Soils (F19) Dark Surface (TE12	
Hydric Soil Indicato Histosol (A1) Histic Epiped Black Histic (/ Hydrogen Sul	on (A2) A3) Ifide (A4) vers (A5)		b=Masked Sand Grains Dark Surface Polyvalue Bel Thin Dark Sur Loamy Gleyee Denleted Ma	(S7) ow Surface (S8 face (S9) d Matrix (F2) trix (F3)	3)		² Location: Indicato	PL=Pore Lining, M=M rs for Problemat 2 cm Muck (A: Coast Prairie F Piedmont Floc Very Shallow [Other (Explain	atrix. ic Hydric Soils ³ : 10) Redox (A16) odplain Soils (F19) Dark Surface (TF12 Lin Remarks))
Hydric Soil Indicatc Histosol (A1) Histic Epiped Black Histic (/ Hydrogen Sul Stratified Lay 2cm Muck (A	on (A2) A3) Ifide (A4) rers (A5)		b=Masked Sand Grains. Dark Surface Polyvalue Bel Thin Dark Sur Loamy Gleyee Depleted Ma Redox Dark S	(S7) ow Surface (S8 face (S9) d Matrix (F2) trix (F3) uuface (F6)	3)		² Location: Indicato	PL=Pore Lining, M=N rs for Problemat 2 cm Muck (A: Coast Prairie F Piedmont Floc Very Shallow I Other (Explain	atrix. ic Hydric Soils ³ : 10) Redox (A16) odplain Soils (F19) Dark Surface (TF12 in Remarks))
Hydric Soil Indicatc Histosol (A1) Histic Epiped Black Histic (<i>I</i> Hydrogen Sul Stratified Lay 2cm Muck (A Depleted Bele	on (A2) A3) Ifide (A4) vers (A5) 10) ow Dark Surface	: (A11)	b=Masked Sand Grains. Dark Surface Polyvalue Bel Thin Dark Sur Loamy Gleyee Depleted Mar Redox Dark S Depleted Dar	(S7) ow Surface (S8 face (S9) d Matrix (F2) trix (F3) urface (F6) k Surface (F7)	3)		² Location: Indicato	PL=Pore Lining, M=M rs for Problemat 2 cm Muck (A: Coast Prairie F Piedmont Floo Very Shallow I Other (Explain	atrix. ic Hydric Soils ³ : 10) Aedox (A16) odplain Soils (F19) Dark Surface (TF12 in Remarks))
Hydric Soil Indicatc Histosol (A1) Histic Epiped Black Histic Epiped Hydrogen Sul Stratified Lay 2cm Muck (A Depleted Bele Thick Dark Su	on (A2) A3) Ifide (A4) rers (A5) .10) ow Dark Surface urface (A12)	: (A11)	b=Masked Sand Grains. Dark Surface Polyvalue Bel Thin Dark Sur Loamy Gleyee Depleted Mar Redox Dark S Depleted Dar Redox Depre:	(S7) ow Surface (S8 face (S9) d Matrix (F2) trix (F3) urface (F6) k Surface (F7) ssions (F8)	3)		² Location: Indicato	PL=Pore Lining, M=M rs for Problemat 2 cm Muck (A: Coast Prairie F Piedmont Floc Very Shallow I Other (Explain ³ Indicators of	atrix. ic Hydric Soils ³ : 10) Aedox (A16) odplain Soils (F19) Dark Surface (TF12 in Remarks)) ation and
Hydric Soil Indicatc Histosol (A1) Histic Epiped Black Histic Epiped Hydrogen Sul Stratified Lay 2cm Muck (A Depleted Bele Thick Dark Su Sandy Mucky	on (A2) A3) Ifide (A4) rers (A5) .10) ow Dark Surface ırface (A12) r Mineral (S1)	: (A11)	b=Masked Sand Grains. Dark Surface Polyvalue Bel Thin Dark Sur Loamy Gleyee Depleted Mar Redox Dark S Depleted Dar Redox Depre: Iron-Mangan	(S7) ow Surface (S8 face (S9) d Matrix (F2) trix (F3) urface (F6) k Surface (F7) ssions (F8) ese Masses (F1	3)		² Location: Indicato	PL=Pore Lining, M=M rs for Problemat 2 cm Muck (A: Coast Prairie F Piedmont Floc Very Shallow I Other (Explain ³ Indicators of wetland hydrc	latrix. ic Hydric Soils ³ : 10) Aedox (A16) odplain Soils (F19) Dark Surface (TF12 in Remarks) hydrophytic veget blogy must be pres) ation and ent, unless
Hydric Soil Indicatc Histosol (A1) Histic Epiped Black Histic (/ Hydrogen Sul Stratified Lay 2cm Muck (A Depleted Bele Thick Dark Su Sandy Mucky Sandy Gleyed	on (A2) A3) Ifide (A4) rers (A5) .10) ow Dark Surface ırface (A12) r Mineral (S1) d Matrix (S4)	· (A11)	b=Masked Sand Grains. Dark Surface Polyvalue Bel Thin Dark Sur Loamy Gleyee Depleted Ma Redox Dark S Depleted Dar Redox Depre: Iron-Mangan Umbric Surfa	(S7) ow Surface (S8 face (S9) d Matrix (F2) trix (F3) urface (F6) k Surface (F7) ssions (F8) ese Masses (F1 ce (F13)	3)		² Location: Indicato	PL=Pore Lining, M=M rs for Problemat 2 cm Muck (A: Coast Prairie F Piedmont Floc Very Shallow I Other (Explain ³ Indicators of wetland hydrc disturbed or p	atrix. ic Hydric Soils ³ : 10) Redox (A16) odplain Soils (F19) Dark Surface (TF12 in Remarks) hydrophytic veget plogy must be prese roblematic.) ation and ent, unless
Hydric Soil Indicatc Histosol (A1) Histic Epiped Black Histic (Hydrogen Sul Stratified Lay 2cm Muck (A Depleted Bele Thick Dark Su Sandy Mucky Sandy Gleyed Sandy Redox	on (A2) A3) Ifide (A4) rers (A5) 10) ow Dark Surface urface (A12) r Mineral (S1) d Matrix (S4) (S5)	: (A11)	b=Masked Sand Grains. Dark Surface Polyvalue Bel Loamy Gleyee Depleted Ma Redox Dark S Depleted Dar Redox Depre: Iron-Mangan Umbric Surfa Piedmont Flo	(S7) ow Surface (S8) face (S9) d Matrix (F2) trix (F3) urface (F6) k Surface (F7) ssions (F8) ese Masses (F1 ce (F13) odplain Soils (I	3) 12) F19)		² Location: Indicato	PL=Pore Lining, M=M rs for Problemat 2 cm Muck (A: Coast Prairie F Piedmont Floc Very Shallow I Other (Explain ³ Indicators of wetland hydro disturbed or p	atrix. ic Hydric Soils ³ : 10) Redox (A16) odplain Soils (F19) Dark Surface (TF12 in Remarks) hydrophytic veget plogy must be prese roblematic.) ation and ent, unless
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Hydric Soil Indicatc Histosol (A1) Histic Epiped Black Histic (/ Hydrogen Sul Stratified Lay 2cm Muck (A Depleted Beld Thick Dark Su Sandy Mucky Sandy Gleyed Sandy Gleyed Sandy Redox Stripped Mat Restrictive Layer (if Type Depth (inches) Remarks:	on (A2) A3) Ifide (A4) vers (A5) 10) ow Dark Surface urface (A12) r Mineral (S1) d Matrix (S4) (S5) r vix (S6) f observed): : : No hydric s	(A11) coil indicators	Dark Surface Polyvalue Bel Thin Dark Sur Loamy Gleyee Depleted Ma Redox Dark S Redox Dark S Redox Depleted Dar Redox Depleted Dar Redox Depleted Dar Redox Depleted Dar Redox Depresent and soil does	(S7) ow Surface (S8 face (S9) d Matrix (F2) trix (F3) urface (F6) k Surface (F7) ssions (F8) ese Masses (F1 odplain Soils (i laterial (F21)	3) 12) F19)	inition of	² Location: Indicato	PL=Pore Lining, M=M rs for Problemat 2 cm Muck (A: Coast Prairie F Piedmont Floc Very Shallow I Other (Explain ³ Indicators of wetland hydrc disturbed or p Hydric il; parameter is	atrix. ic Hydric Soils ³ : 10) Redox (A16) odplain Soils (F19) Dark Surface (TF12 in Remarks) hydrophytic veget ology must be prese roblematic.) ation and ent, unless NO
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				ماريطه	Dama	Indiantan	1				
Tree Stratum	(Plot size:	30' radius)		% Cover	Sn?	Status*	Dominance	Tost Works	noot.		
1	(FIOL SIZE.	30 Taulus)		70 COVEI		Status	# Dominan			0	(A)
1. 2					·		# Dominan	LS OBL, FACM	, FAC.	0	(A)
2					·		# Dominan	ts across all s	trata	1	(B)
3. 					·		# Dominan		liala.	1	(6)
4					·		% Dominar			0%	(A/B)
5					·		70 Dominar	ILS ODE, I ACV	v, i AC.	070	(A, D)
0					·		Provalence	Index Works	hoot.		
7					- Tota	Cover	Total %	Cover of	ileet.	Multiply B	
Sanling Stratu	m (Plot size:	30' radius			- 1018	I COVEI			- v 1 –		<u>y.</u>
1							EACW/		×2-		
2					·		EAC	15	- x2-	45	
2					·		EACU	- 15	×1-	352	
3. 					·			00	- ×4-	552	
4					·		Sum:	103	(A)	307	(B)
5. 							Sum.	105	(A)	337	(6)
0. 							Broy	alanca Inday	- P/A -	2.95	
7					·		FIEV		- D/A -	5.85	
					- Toto	Cover	Hudrophut	ic Vocatation	Indicators		
Shrub Stratum	(Diet size)	15' radius			= 1018	I COVEI	пушорпус		Toct ic > EO%		
1								- Brovalance	ndov is $z = 2$ (.	
2					·			- Broblomatic	Hudrophytic	Vogotation ¹	(
2					·			- Banid Tast f	or Undrophytic	ic Vogetation	(explain)
3. 					·						
4					·			worphologi		ns	
5					·		¹ Indicators of	hydric soil and w	etland hydrology	must be presen	t, unless
ъ					·		disturbed or p	oroblematic.	. Chucke		
7.							Deminions	or vegetatio	li Slidid.		
		10 ¹ modius)			= 101a	Cover	Trop Wood				(Car)
	(PIOL SIZE:	to radius)		05	v	FACU	more in heigh	y plants, excludii t and 3in (7.6cm	ig woody vines, a or larger in diam	approximately 20 neter at breast he	eight (DBH)
1. Poa pia				15			Ū				,
2. Faspan	uni laeve			- 15	·						
3. <u>IIII0IIu</u>	initepens				·	FACO	Sanling - W	oodu planta ova	uding woody vin	or approvimatel	v 20ft (6m)
4. 5							or more in he	ight and less that	1 3in (7.6cm) DBF	es, approximatei 1.	y 2011 (611)
5. 					·						
0. 7											
7. 8					·		Shrub - Wo	odu plante ovelu	ding woody vinor	annrovimatoly	2 to 20ft (1
o					·		to 6m) in heig	ht.	uing woody vines	s, approximately	5 10 2011 (1
9					·		,				
10.					·		Horb Alle		and Antonia to a	- Lord to a la cola conce	
11.					·		regardless of	size. Includes wo	ody plants, inc ody plants, excep	t woody vines, le	ess than
12.				102		Course	approximatel	/ 3ft (1m) in heig	ht.	,	
				103	= 10ta	Cover					
Woody Vines	(Plot size:	30 radius)									
1					·		14/2				
2.					·		woody vin	e - All woody vir	nes, regardless of	neight.	
3.											
4.								Hydrophytic			
5.								Vegetation			
					= Tota	l Cover		Present?		NO	
Remarks: (If obs	erved, list morph	ological adaptations l	below).								
No hydr	ophytic vegetat	ion indicators prese	ent; parameter	is not met.							

- hh

Project Site:	Mammot	h Caves NP			- city/county.	Chata	on County	Canadia a D	Samp. Date: 10	0/1/2018
Applicant/Owner:	National I	Park Service			Castian	State:	Kentucky	Sampling P	oint:	DP-8
nvestigator(s):	Sean Mur	ray			Section	, Townsh	ip, Range:	NA	C I (0()	
andform (hillslope, te	errace, etc.):	Terrace			Local relief	(concave, co	onvex, none):	Concave	Slope (%):	5-7
ubregion (LRR or	MLRA):	LRR N; MLR	A 120A	Lat:	37.18621		Long:	-77.373135	Datum:	WGS84
oil Map Unit:	Clarkrang	e silt loam, 2 t	o 6 percent slopes						NWI Classif.:	Upland
Are climatic/hydrol	ogic conditi	ons on the site	e typical for this tim	ne of ye	ear?	Yes	(If no, e	xplain in Remarks.)		
Are Vegetation, Soil	l, or Hydrol	ogy significant	ly disturbed?	No				Norn	nal Circumstances?	Yes
Are Vegetation, Soil	l, or Hydrol	ogy naturally p	problematic?	No				(If need	ded, explain any answ	ers in Remark
SUMMARY OF	FINDING	5 - Attach s	ite map showin	ig sam	nple point le	ocation	s, transed	cts, important fe	atures, etc.	
lydrophytic Vegeta	ation Preser	nt?	NO							
Hydric Soil Present?	?		NO				ls	This Sample Area W	/ithin a Wetland?	NO
Vetland Hydrology	Present?		NO							
(emarks:	One or m Data poi	ore paramet nt located in	an upland swale	i is not create	a wetland. d from erosio	on. Loca	ted within	maintained lawn.	Vegetation regularl	y maintaine
HYDROLOGY										
Vetland Hydrology	Indicators:							Secondary Indicato	rs (minimum of two r	equired)
rimary Indicators ((minimum d	of one is requir	red; check all that a	pply)				Surface	Soil Cracks (B6)	·
Surface Water	r (A1)	-	Aquatic Fau	na (B13))			Sparsel	Vegetated Concave Sur	rface (B8)
High Water Ta	able (A2)		True Aquatio	c Plants	(B14)			Drainag	e Patterns (B10)	
Saturation (A:	3)		Hydrogen Su	ulfide Od	dor (C1)			Moss Tr	im Lines (B16)	
Water Marks	(B1)		Oxidized Rhi	izospher	res on Living Roo	ots (C3)		Drv-Sea	son Water Table (C2)	
Sediment Der	osits (B2)		Presence of	Reduce	d Iron (C4)			Cravfish	Burrows (C8)	
Drift Denosite	(B3)		Recent Iron	Reducti	on in Tilled Soils	s (C6)		Saturati	on Visible on Aerial Ima	gery (C9)
Algal Mat or C	rust (R4)		Thin Muck S	urface /	(7)			Stunted	or Stressed Plants (D1)	
Iron Denosite	(B5)		Other (Evola	ain in Ro	marks)			Geomo	nhic Position (D2)	
Inundation Vie	(b) sible on Aori	J (P7)			marksy			Microto	pographic Poliof (D4)	
Water Stainer	d Loovos (PQ)	ar (B7)						EAC-Nor	utral Tost (D5)	
water-Stamet	u Leaves (D5)						1			
ield Observations:										
c			Depth (ir		-					
urface Water Pres	ent?	NO	(ncnes):	0					
urface Water Prese Vater Table Presen	ent? nt?	NO NO	Depth (ir	nches): nches):	0 >18		We	etland Hydrology Pres	ent?	NO
Surface Water Pres Vater Table Presen Jaturation Present? Describe Recorded	ent? nt? Data (strea No prima	NO NO m gauge, mon	Depth (ir Depth (ir itoring well, aerial p	nches): nches): nches): photos, dicator	0 >18 >18 , previous insp r of wetland l	ections), i hydrolog	We if available: y present;	etland Hydrology Pres	ent?	NO
Sourface Water Pres Vater Table Preser aturation Present? Describe Recorded Remarks:	ent? t? Data (strea No prima	NO NO m gauge, mon	Depth (in Depth (ir itoring well, aerial p	nches): nches): photos, dicator	0 >18 >18 , previous insp	ections), i hydrolog	We if available: y present;	etland Hydrology Pres	ent?	<u>NO</u>
urface Water Pres Vater Table Preser aturation Present Describe Recorded Remarks:	ent? t? Data (strea No prima (Describe t	NO NO m gauge, mon ary and only o	Depth (ir Depth (ir itoring well, aerial p one secondary inc	nches): nches): nches): photos, dicator	0 >18 >18 r previous insp r of wetland l	ections), i hydrolog	We if available: y present; bsence of ir	parameter is not n	ent?	NO
Soll Soll	ent? t? Data (strea No prima (Describe t Matrix	NO NO m gauge, mon ary and only o	Depth (in Depth (in Depth (in itoring well, aerial p one secondary inc eeded to document	dicator	0 >18 >18 r previous insp r of wetland l dicator or conf dox Features	firm the a	We if available: y present; bsence of ir	parameter is not n	ent?	NO
urface Water Pres Vater Table Preser aturation Present bescribe Recorded emarks: GOIL rofile Description: bepth (in) Color (ent? t? Data (strea No prima (Describe t <u>Matrix</u> (moist)	NO NO m gauge, mon ary and only o	Depth (in Depth (in Depth (in itoring well, aerial p one secondary inc eeded to document Color (moist	t the inc nches): nches): photos, dicator	0 >18 >18 previous insp r of wetland l dicator or conf dox Features %	ections), i hydrolog firm the a Type ¹	We if available: y present; bsence of ir Loc ²	parameter is not n	ent?	NO
urface Water Pres Vater Table Preser aturation Present escribe Recorded emarks: COIL rofile Description: tepth (in) Color (0-4 10YF	ent? t? Data (strea No prima (Describe t Matrix (moist) 84/3	NO NO m gauge, mon ary and only of o the depth no % 100	Depth (in Depth (in Depth (in itoring well, aerial p one secondary ind eeded to document Color (moist	t the inc nches): nches): photos, dicator	0 >18 >18 previous insp r of wetland l dicator or conf dox Features %	firm the a	We if available: ay present; bsence of ir Loc ²	parameter is not n ndicators.)	ent?	NO marks
urface Water Pres /ater Table Preser aturation Presenti escribe Recorded emarks: OIL rofile Description: epth (in) Color (0-4 10YF 4-6 10YF	ent? t? Data (strea No prima (Describe t Matrix (moist) R 4/3 R 4/3	NO NO m gauge, mon ary and only of o the depth no % 100 70	Depth (in Depth (in Depth (in itoring well, aerial p one secondary ind eeded to document Color (moist	t the inc Real	0 >18 >18 previous insp r of wetland l dicator or conf dox Features % 30	firm the a	We if available: ay present; bsence of ir Loc ² m	parameter is not m ndicators.) Texture loam	ent?	NO marks
urface Water Pres /ater Table Preser aturation Presenti escribe Recorded emarks: OIL rofile Description: epth (in) Color (0-4 10YF 6+	ent? t? Data (strea No prima (Describe t Matrix (moist) R 4/3 R 4/3	NO NO m gauge, mon ary and only of o the depth no % 100 70	Depth (in Depth (in Depth (in itoring well, aerial p one secondary inc eeded to document Color (moist	t the inc Real	0 >18 >18 previous insp r of wetland l dicator or conf dox Features % 30	firm the a	We if available: ay present; bsence of ir Loc ² m	parameter is not m ndicators.) Texture loam bedrock	ent?	NO emarks
urface Water Pres /ater Table Preser aturation Presenti escribe Recorded emarks: OIL rofile Description: epth (in) Color (0-4 10YF 6+	ent? t? Data (strea No prima (Describe t Matrix (moist) R 4/3 R 4/3	NO NO m gauge, mon ary and only of o the depth no % 100 70	Depth (in Depth (in Depth (in itoring well, aerial p one secondary inc eeded to document Color (moist	aches): nches): photos, dicator the inc Rec t)	0 >18 >18 previous insp r of wetland l dicator or conf dox Features % 30	firm the a	We if available: ay present; bsence of ir Loc ² m	etland Hydrology Pres parameter is not m ndicators.) Texture loam bedrock	ent?	NO emarks er refusal
Arface Water Press Jater Table Preser aturation Presenti escribe Recorded emarks: OIL rofile Description: epth (in) Color (0-4 10YF 6+ 6+	ent? t? Data (strea No prima (Describe t Matrix (moist) R 4/3 R 4/3 R 4/3	NO NO m gauge, mon ary and only of o the depth no % 100 70	Eepth (in Depth (in Depth (in itoring well, aerial p one secondary inc eeded to document Color (moist 7.5YR 4/3	ains	0 >18 >18 previous insp r of wetland l dicator or conf dox Features % 30 30	firm the a	We if available: Ty present; bsence of ir Loc ² m	parameter is not m ndicators.) Texture loam bedrock	ent?	NO marks
urface Water Pres /ater Table Preser aturation Presenti escribe Recorded emarks: OIL rofile Description: epth (in) Color (0-4 10YF 6+ 6+	ent? t? Data (strea No prima (Describe t Matrix (moist) R 4/3 R 4/3 D=Depletion, I	NO NO m gauge, mon ary and only of o the depth no 0 the depth no 70 70 RM=Reduced Mat	Color (moist Color	ains.	0 >18 >18 previous insp r of wetland l dicator or conf dox Features % 30 30	firm the a	We if available: cy present; bsence of ir Loc ² m	parameter is not m ndicators.) Texture loam bedrock	ent?	NO emarks er refusal
urface Water Pres Vater Table Preser aturation Presenti escribe Recorded emarks: OIL rofile Description: hepth (in) Color (0-4 10YF 6+ 6+ Color (0-4 10YF 6+ Color (0-4 10YF 7+ Color (0-4 10YF) 7+ Color (0-4 10YF)	ent? t? Data (strea No prima (Describe t Matrix (moist) R 4/3 R 4/3 D=Depletion, I rs:	NO NO m gauge, mon ary and only of o the depth no 0 the depth no 70 70 RM=Reduced Mat	Depth (in Depth (in Depth (in itoring well, aerial p one secondary inc eeded to document Color (moist 7.5YR 4/3	ains.	0 >18 >18 previous insp r of wetland l dicator or conf dox Features % 30 30	firm the a	We if available: y present; bsence of ir Loc ² m	etland Hydrology Pres parameter is not m ndicators.) Texture loam loam bedrock 2Location: PL=Pore Linin Indicators for Prob	net.	marks er refusal
urface Water Pres Vater Table Preser aturation Presenti vescribe Recorded emarks: GOIL rofile Description: vepth (in) Color (0-4 10YF 6+ 6+ 6+ rype: C=Concentration, lydric Soil Indicaton Histosol (A1)	ent? t? Data (strea No prima (Describe t Matrix (moist) R 4/3 R 4/3 D=Depletion, I rs:	NO NO m gauge, mon ary and only of o the depth no o the depth no 70 RM=Reduced Mat	Depth (in Depth (in Depth (in itoring well, aerial p one secondary inc eeded to document Color (moist 7.5YR 4/3	ains.	0 >18 >18 previous insp r of wetland l dicator or conf dox Features % 30 30 e (S7)	firm the a	We if available: y present; bsence of ir Loc ² m	parameter is not m ndicators.) Texture loam bedrock 	eent?	NO marks er refusal
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urface Water Press /ater Table Preser aturation Presents escribe Recorded emarks: OIL rofile Description: epth (in) 0-4 4-6 10YF 6+ (vpe: C=Concentration, ydric Soil Indicator Histosol (A1) Histic Epipedo Black Histic (A Hydrogen Sulf	ent? t? Data (strea No prima (Describe t Matrix (moist) R 4/3 R 4/3 D=Depletion, I rs: on (A2) (3) fide (A4)	NO NO m gauge, mon ary and only of o the depth no % 100 70 	Depth (in Depth (in Depth (ir itoring well, aerial p one secondary inc eeded to document Color (moist 7.5YR 4/3 rix, MS=Masked Sand Gr Poly Dark Poly Thin Loan	ains.	0 >18 >18 previous insp r of wetland l dicator or conf dox Features % 30 e (S7) elow Surface (S8) ed Matrix (F2)	firm the a	We if available: cy present; bsence of ir Loc ² m	parameter is not m parameter is not m ndicators.) Texture loam bedrock 	ent?	NO emarks er refusal
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urface Water Pres Vater Table Preser aturation Present Describe Recorded temarks: COIL rofile Description: Depth (in) Color (0-4 10YF 4-6 10YF 6+	ent? tt? Data (strea No prima (Describe t Matrix (moist) 4/3 4/3 Tobust D=Depletion, I rs: D=Depletion, I rs: S(S) rix (S6)	NO NO m gauge, mon ary and only of o the depth ne % 100 70 3M=Reduced Mat		ains. ains.	0 >18 >18 >18 r of wetland I dicator or conf dox Features % 30 30 (S) e (S7) elow Surface (S8) ed Matrix (F2) atrix (F3) Surface (F6) rrk Surface (F7) essions (F8) nese Masses (F1) ace (F13) oodplain Soils (f Material (F21)	ections), i hydrolog firm the a <u>Type¹</u> <u>c</u> 3) 3)	We if available: y present; bsence of ir Loc ² m	parameter is not m ndicators.) Texture loam loam bedrock 	ent?	NO emarks er refusal 2) tation and sent, unless
SOIL SOIL SOIL SOIL SOIL SOIL SOIL SOIL	ent? t?? Data (strea No prima (Describe t Matrix (moist) 4/3 4/3 TopeDepletion, I rs: D=Depletion, I rs	NO NO m gauge, mon ary and only of o the depth ne % 100 70 30 80 80 80 80 80 80 80 80 80 80 80 80 80	eeded to document Color (moist	ains. ai	0 >18 >18 previous insp r of wetland I dicator or conf dox Features % 30 e (S7) elow Surface (S8) red Matrix (F2) atrix (F3) Surface (F6) rrk Surface (F6) rrk Surface (F6) rrk Surface (F6) rrk Surface (F1) ace (F13) oodplain Soils (f Material (F21)	ections), i hydrolog firm the a <u>Type¹</u> <u>c</u> 3) 12) F19)	We if available: y present; bsence of ir Loc ²	parameter is not m ndicators.) Texture loam loam bedrock 2Location: PL=Pore Linin Indicators for Prob 2 cm M Coast P. Piedmo Very Sh Other (f	ent?	NO emarks er refusal 2) tation and sent, unless
SOIL Profile Description: Depth (in) Color (0-4 4-6 10YF 6+ Concentration, Histosol (A1) Histic Epipedo Black Histic (A Hydrogen Sulf Stratified Laye 2cm Muck (A1) Histic Epipedo Black Histic (A Hydrogen Sulf Stratified Laye 2cm Muck (A1) Color (Color (Col	ent? t? Data (strea No prima (Describe t Matrix (moist) X 4/3 X 4/3 D=Depletion, I rs: D=Depletion, I rs: D=Depletion, I rs: D=Depletion, I (Mineral (S1) Mineral (S1) Matrix (S4) (S5) rix (S6) observed): bedrock 6	NO NO m gauge, mon ary and only of o the depth no 0 the depth no 70 70 8M=Reduced Mat	eeded to document Color (moist	ains.	0 >18 >18 previous insp r of wetland I dicator or conf dox Features % 30 30 4 (S7) elow Surface (S8) rd Aurix (F2) atrix (F3) Surface (F6) ink Surface (F6) ink Surface (F7) essions (F8) nese Masses (F1 ace (F13) oodplain Soils (f Material (F21)	ections), i hydrolog firm the a 	We if available: y present; bsence of ir Loc ² m	parameter is not m ndicators.) Texture loam loam ² Location: PL=Pore Linin Indicators for Prob 2 cm M Coast P. Piedmo Very Sh Other (f ³ Indicat wetlanc disturbe	ent?	NO emarks er refusal er refusal 2) tation and sent, unless



	Absolute	Dom.	Indicator			
Tree Stratum (Plot size: 30' radius)	% Cover	Sp?	Status*	Dominance Test Worksheet:		
1				# Dominants OBL, FACW, FAC:	0	(A)
2						
3.				# Dominants across all strata:	1	(B)
4. 					0%	(4 (5)
5.		·		% Dominants OBL, FACW, FAC:	070	(A/B)
6		·		Prevalence Index Worksheet:		
7		- Tota	Cover	Total % Cover of:	Multiply By	<i>,</i> -
Sapling Stratum (Plot size: 30' radius)		- 1018	I COVEI			<u>. </u>
1.				FACW x2=		
2.				FAC x 3 =		
3.	·			FACU 63 x 4 =	252	
4.	·			UPL 33 x 5 =	165	
5.				Sum: 96 (A)	417	(B)
6.						
7.		·		Prevalence Index = B/A =	4.34	
		= Tota	l Cover	Hydrophytic Vegetation Indicators:		
Shrub Stratum (Plot size: 15' radius)				Dominance Test is > 50%		
1		. <u> </u>		Prevalence Index is <= 3.	0	
2				Problematic Hydrophytic	c Vegetation ¹ (e	explain)
3				Rapid Test for Hydrophy	tic Vegetation	
4				Morphological Adaptatio	ons	
5				¹ Indicators of hydric soil and wetland hydrolog	y must be present	, unless
6				disturbed or problematic.		
7				Definitions of Vegetation Strata:		
		= Tota	l Cover			
Herb Stratum (Plot size: <u>10' radius</u>)				I ree - Woody plants, excluding woody vines,	approximately 20f	ft (6m) or
1. Poa pratensis	63	<u> </u>	FACU	more in neight and sin (7.00m) of larger in dia	ineter at breast ne	igitt (DDH).
2. Plantago lanceolata	15					
3. Lespedeza repens				Sopling Westerlast such discussed with		20(1) (C)
	3	·		or more in height and less than 3in (7.6cm) DB	ies, approximately H.	20ft (6m)
5		·				
7						
8				Shrub - Woody plants, excluding woody vine	s annrovimately 3	8 to 20ft (1
9		·		to 6m) in height.	.s, approximately s	10 2011 (1
10		·				
11.				Herb - All herbaceous (non-woody) plants. ir	cluding herbaceou	us vines,
12.		·		regardless of size. Includes woody plants, exce	pt woody vines, le	ss than
	96	= Tota	l Cover	approximately 3ft (1m) in height.		
Woody Vines (Plot size: 30' radius)						
1.						
2.		·		Woody vine - All woody vines, regardless of	f height.	
3.				,,,		
4.				Hydrophytic		
5.				Vegetation		
		= Tota	l Cover	Present?	NO	
						_
Remarks: (If observed, list morphological adaptations below)				ļ		
Ne herberter setter in the protocol adaptations below).						
No hydrophytic vegetation indicators present; para	neter is not met.					

- Whb	v	VETLAND DET	ERMINATION DA	TA FORM - I	Eastern	Mountai	ins and	Piedmont Re	egion	DP-9
Project Site:	Mammo	th Caves NP		City/County:	Edmonso	on County			Samp. Date: 10	/1/2018
Applicant/Owner:	National	Park Service		,, , _	State:	Kentucky		Sampling Point:		P-9
Investigator(s):	Sean Mu	rray		Section	, Townsh	ip, Range:	NA			
Landform (hillslope, t	errace, etc.):	Terrace		Local relief	(concave, co	onvex, none):	Concave		Slope (%):	3-5
Subregion (LRR or	MLRA):	LRR N; MLRA 1	L 20A Lat	37.186325		Long:	-77.3731	35	Datum:	WGS84
Soil Map Unit:	Clarkran	ge silt loam, 2 to	5 percent slopes	-					NWI Classif.:	Upland
Are climatic/hydrol	logic condit	tions on the site t	ypical for this time of y	ear?	Yes	(If no, e	xplain in l	Remarks.)		
Are Vegetation, Soi	il, or Hydro	logy significantly	disturbed? No					Normal Ci	rcumstances?	Yes
Are vegetation, so	ii, or Hydro	logy naturally pro	No No				_	(ii needed, e	explain any answ	ers in Remarks.)
		S - Attach site	man chowing car	nnle noint l	ocation	s transor	rtc imn	ortant featur	os oto	
JUIVINANT OF	FINDING	- Allach Site		inhie hourt is		s, transet	us, imp		es, etc.	
Hydrophylic Vegeta	ation Prese		NO			lc -	Thic Sam	nlo Aroa Withir	a Wotland?	NO
Wetland Hydrology	: / Present?	-				15				
Remarks:	One or r	nore narameter	s lacking. Area is no	t a wetland.						
	Data po	int located in a	shallow depression v	vithin an unm	aintaine	d field.				
HYDROLOGY	/ Indicators	•					Second	ary Indicators (m	ninimum of two r	equired)
Primary Indicators	(minimum	of one is required	l; check all that apply)				Jecona	Surface Soil C	Cracks (B6)	-yun cuj
Surface Wate	r (A1)		Aquatic Fauna (B13	;)				Sparsely Veg	etated Concave Sur	face (B8)
High Water Ta	able (A2)	-	True Aquatic Plants	, s (B14)				Drainage Patt	terns (B10)	
Saturation (A	3)	_	Hydrogen Sulfide C	dor (C1)				Moss Trim Lir	nes (B16)	
Water Marks	(B1)	-	Oxidized Rhizosphe	eres on Living Roo	ots (C3)			Dry-Season W	Vater Table (C2)	
Sediment Dep	oosits (B2)	-	Presence of Reduce	ed Iron (C4)				Crayfish Burr	ows (C8)	
Drift Deposits	5 (B3)		Recent Iron Reduct	ion in Tilled Soils	s (C6)			Saturation Vi	sible on Aerial Imag	gery (C9)
Algal Mat or (Crust (B4)	_	Thin Muck Surface	(C7)				Stunted or St	ressed Plants (D1)	
Iron Deposits	(B5)		Other (Explain in Re	emarks)				Geomorphic	Position (D2)	
Inundation Vi	sible on Aer	ial (B7)						Microtopogra	aphic Relief (D4)	
Water-Staine	d Leaves (BS	9)						FAC-Neutral	Fest (D5)	
Field Observations:	:									
Surface Water Pres	sent?	NO	Depth (inches)	: 0						
Water Table Preser	nt?	NO	Depth (inches)	: >18		We	etland Hy	drology Present?		NO
Saturation Present	ſ	NO	Depth (Inches)	: >18						
SOIL										
Profile Description:	: (Describe	to the depth need	ded to document the ir	idicator or conf	firm the a	bsence of in	ndicators.)		
Depth	Matrix		Re	edox Features						
(in) Color	(moist)	%	Color (moist)	%	Type ¹	Loc ²		Texture	Re	marks
0-8 10Y	R 3/3	60	7.5YR 3/4	5	С	р		lay loam		
0-8 101	R 4/6	35						clay	mixtu	re of soils
8-18 10Y	R 4/6 P 2/2		7.5YR 3/4	5	C	р		clay	mixtu	re of soils
0-10 1011	N 3/ 3							lay loan		
¹ Type: C=Concentration,	, D=Depletion,	RM=Reduced Matrix,	MS=Masked Sand Grains.		· · ·		² Location	: PL=Pore Lining, M=N	Matrix.	
Hydric Soil Indicato	ors:						Indicat	ors for Problema	tic Hydric Soils ³	
							mulcati		tie rigurie solis .	
Histosol (A1)	(Dark Surfac	e (S7)				2 cm Muck (A	(10)	
Histic Epipedo	on (A2)		Polyvalue B	elow Surface (S8	3)			Coast Prairie	Redox (A16)	
Black Histic (A	43) fide (A4)		Inin Dark S	urface (S9)				Piedmont Flo	Odplain Solls (F19)	
Hydrogen Sul	nue (A4)		Loarny Gley	eu Matrix (F2)				Other (Eveloi	Dark Surface (TF12	.)
2cm Muck (A	10)		Beday Dark	Surface (F6)					in in Kennarks)	
Depleted Belo	10) Sw Dark Suri	face (A11)		ark Surface (F7)						
Thick Dark Su	rface (A12)		Bedox Dep	ressions (F8)				³ Indicators of	f hydrophytic yogot	ation and
Sandy Muckv	Mineral (S1)	Iron-Manga	inese Masses (F1	.2)			wetland hydr	ology must he pres	ent. unless
Sandy Gleyed	Matrix (S4)		Umbric Sur	face (F13)				disturbed or i	problematic.	,
Sandy Redox	(S5)		Piedmont F	loodplain Soils (F	-19)					
Stripped Mat	rix (S6)		Red Parent	Material (F21)						
Restrictive Layer (if	observed)	:								
Туре	:							Hydrid	Soil Present?	NO
Depth (inches):										
Kemarks:	No hydr	ic soil indicators	s present and soil do	es not meet N	ITCHS de	finition of	nydric so	on; parameter i	s not met.	



110001010	Dom.	inuicator				
% Cover	Sp?	Status*	Dominance Test Worksheet:			
			# Dominants OBL, FACW, FAC:	1 (A))	
			# Dominants across all strata:	3 (B))	
			% Dominants OBL, FACW, FAC:	33% (A)	/B)	
			Prevalence Index Worksheet:			
	= Tota	l Cover	Total % Cover of:	Multiply By:		
			OBL x 1 =			
			FACW 18 x 2 =	36		
			FAC <u>3</u> x 3 =	9		
			FACU <u>56</u> x 4 =	224		
			$\frac{\text{UPL}}{3} \times 5 =$	15	,	
			Sum: 80 (A)	284 (B))	
			Prevalence Index = B/A =	3.55		
	T . 4 .	1.0				
	= 101a	Cover	Dominance Test is > 50%			
				о О		
			Problematic Hydrophyti	.U	`	
			Banid Test for Hydrophy	tic Vegetation		
			Morphological Adaptati			
				5115		
			Indicators of hydric soil and wetland hydrolog	gy must be present, unles	s	
			Definitions of Vegetation Strata:			
	= Tota	l Cover				
			Tree - Woody plants, excluding woody vines,	approximately 20ft (6m)	or	
38	х	FACU	more in height and 3in (7.6cm) or larger in dia	meter at breast height (D	BH)	
15	x	FACW				
15	х	FACU				
3		UPL	Sapling - Woody plants, excluding woody vi	nes, approximately 20ft (6	6m)	
3		FACU	or more in height and less than 3in (7.6cm) DE	iH.		
3		FACW				
3		FAC				
			Shrub - Woody plants, excluding woody vine	es, approximately 3 to 20f	ft (1	
			to 6m) in height.			
			Herb - All herbaceous (non-woody) plants, in	ncluding herbaceous vines	s,	
			regardless of size. Includes woody plants, exce approximately 3ft (1m) in height.	pt woody vines, less than	1	
80	= Tota	l Cover				
			Woody vine - All woody vines, regardless of	of height.		
			Hydrophytic			
			Vegetation			
	= Tota	l Cover	Vegetation Present?	NO		
				# Dominants OBL, FACW, FAC: # Total Cover # Dominants OBL, FACW, FAC: # Dominants OBL, FACW, FAC: # Dominants OBL, FACW, FAC: # Total Cover # Tree - Woody plants, excluding woody vines, more in height and Sin (7.6cm) or larger in dia 15 X 3 FACU 3	# Dominants OBL, FACW, FAC: 1 (A # Dominants OBL, FACW, FAC: 3 (B # Dominants OBL, FACW, FAC: 33% (A # Dominants OBL, FACW x 1 = 56 # Cover FAC 3 x 3 = 9 FAC 3 x 3 = 9 FACU 56 x 4 = 224 UPL 3 x 5 = 15 Sum: 80 284 (B Prevalence Index = B/A = 3.55 15 Sum: Dominance Test is > 50% Prevalence Index is < = 3.0	

whb.	WETL	AND DETERMIN	ATION DAT	A FORM -	Eastern	Mounta	ins and Piedmont R	egion	DP-10
Project Site:	Mammoth Cave	es NP		City/County:	Edmonso	on County		Samp. Date: 10	/1/2018
Applicant/Owner:	National Park S	ervice			State:	Kentucky	Sampling Point:	DI	P-10
Investigator(s):	Sean Murray			Section	n, Towns <mark>h</mark>	ip, Range:	NA		
Landform (hillslope, te	errace, etc.): Ter	race		Local relief	(concave, co	onvex, none):	Concave	Slope (%):	0-2
Subregion (LRR or	MLRA): LRR	N; MLRA 120A	Lat:	37.185895		Long:	-77.373135	Datum:	WGS84
Soil Map Unit:	Clarkrange silt l	oam, 2 to 6 percen	t slopes		Ma a	(16	untain in Damanta (NWI Classif.:	Upland
Are climatic/hydrol	ogic conditions of	n the site typical to	r this time of yea	ar?	res	(if no, e	xplain in Remarks.)	ircumstancos?	Vac
Are Vegetation, Soi	l, or Hydrology sig	aturally problemati	2? <u>No</u>				(If needed.	explain any answe	ers in Remarks.)
	,,	,	<u></u>						,
SUMMARY OF	FINDINGS - At	ttach site map	showing sam	ple point l	ocation	s, transeo	cts, important featur	es, etc.	
Hydrophytic Vegeta	ition Present?	YES				le ⁻	This Sample Area Withi	a Wetland?	VES
Wetland Hydrology	Present?	VES				15	This Sample Area Within		
Remarks:	All parameter	s are met. Area is	classified as a	palustrine e	emergent	(PFM) we	tland.		
	Data point loc	ated in shallow d	epression at th	he edge of a	maintair	ned lawn.			
HYDROLOGY									
Wetland Hydrology	Indicators:						Secondary Indicators (n	ninimum of two re	equired)
Primary Indicators (minimum of one	is required; check	all that apply)				Surface Soil (Cracks (B6)	
Surface Water	r (A1)	Aq	uatic Fauna (B13)				Sparsely Veg	etated Concave Sur	face (B8)
X High Water Ta	able (A2)	Tru	e Aquatic Plants (B14)			X Drainage Pat	terns (B10)	
X Saturation (A3	3)	Hy	drogen Sulfide Od	or (C1)	-+- (C2)		Moss Trim Li	nes (B16)	
Water Marks	(BT)	Ox	uizea Khizosphere	es on Living Ro	uts (L3)		Dry-Season V	vater Table (C2)	
Drift Doposits	(BZ)	Pre	sence of Reduced	n in Tilled Soil	c (C6)		CrayIISI Burr	ows (C8) sible on Aerial Imag	
Algal Mat or C	(B3) Trust (B4)	Thi	n Muck Surface ((77)	5 (CO)		Stunted or St	ressed Plants (D1)	ery (C3)
Iron Deposits	(B5)	Ot	ner (Explain in Rer	narks)			Geomorphic	Position (D2)	
Inundation Vis	sible on Aerial (B7)			indi ito)			Microtopogra	aphic Relief (D4)	
X Water-Stained	d Leaves (B9)						X FAC-Neutral	Test (D5)	
Field Observations:							·		
Surface Water Pres	ent?	NO	Denth (inches):	0					
Water Table Presen		VES	Depth (inches):	10		\\/c	atland Hydrology Present?		VEC
Saturation Present		VES	Depth (inches):	surface			ciana nyarology riesent:		1123
Describe Recorded	Data (stream gau	ge, monitoring wel	l, aerial photos.	previous insp	ections), i	f available:			
Remarks:	At least one p	rimary or two sec	ondary indicat	tors of wetla	and hydro	ology prese	ent; parameter is met.		
SOIL									
Profile Description:	(Describe to the	depth needed to de	ocument the ind	licator or con	firm the a	bsence of ir	dicators.)		
Depth	Matrix		Red	lox Features					
(in) Color (moist)	% Col	or (moist)	%	Type ¹	Loc ²	Texture	Re	marks
0-2 10YF	R 4/2	90 1	DYR 3/6	10	с	р	clay loam		
2-8 10YF	R 5/3	90 1	DYR 3/6	10	C	р	clay loam		
8-18 10YF	R 5/6	85 1	DYR 4/6	15	C	р	clay loam		
¹ Type: C=Concentration.	D=Depletion, RM=Red	duced Matrix. MS=Mask	ed Sand Grains.				² Location: PL=Pore Lining. M=	Matrix.	
Hydric Soil Indicato	rc.	. ,					Indicators for Drahl	tic Undria Calla ³	
	15.						Indicators for Problema	tic Hydric Solis :	
Histosol (A1)			Dark Surface	(S7)			2 cm Muck (A	A10)	
Histic Epipedo	on (A2)		Polyvalue Be	low Surface (S	8)		Coast Prairie	Redox (A16)	
Black Histic (A	3)	_	Thin Dark Su	rface (S9)			Piedmont Flo	odplain Soils (F19)	
Hydrogen Sulf	ide (A4)		Loamy Gleye	d Matrix (F2)			Very Shallow	Dark Surface (TF12)
Stratified Laye	ers (A5)		X Depleted Ma	trix (F3)			Other (Explai	n in Remarks)	
2cm Muck (A1	LU) Nu Derk Court (***		Kedox Dark S	ourtace (F6)					
Thick Dark Com	w Dark Surface (A1		Depleted Dar	K SUITACE (F7)			3	e 1 e 1 e 1	
Sandy Muclas	Mineral (S1)		keuox Depre	SSIUIIS (FO)	12)		² Indicators o	t hydrophytic veget	ation and
Sandy Glaved	Matrix (SA)		Impric Surfa	сэе ividsses (F. ice (F13)			wetland hydr	ology must be pres	ent, uniess
Sandy Redox ((\$5)		Piedmont Flo	odnlain Soils (F19)		disturbed or	problematic.	
Stripped Matr	ix (S6)		Red Parent N	Aaterial (F21)	1107				
Doctrictive Laws (16	obconvert						1		
Restrictive Layer (if	observea):						Hvdri	c Soil Present?	YES
Depth (inches):							, un		·
Remarks:	Indicator F3 (Depleted Matrix)	present and so	il meets NT	CHS defir	ition of hy	dric soil; parameter is	met.	
	·								



	Absolute	Dom.	Indicator				
Tree Stratum (Plot size: 30' radius)	% Cover	Sp?	Status*	Dominance Test Works	heet:		
1.				# Dominants OBL, FAC	N, FAC:	1	(A)
2							
3				# Dominants across all	strata:	1	(B)
4.							
5				% Dominants OBL, FAC	W, FAC:	100%	(A/B)
6							
7				Prevalence Index Work	sheet:		
		= Total	Cover	Total % Cover of:	-	Multiply By	<u>/:</u>
Sapling Stratum (Plot size: 30' radius)				OBL	_ x1=		_
1		· ·		FACW 98	x 2 =	196	
2.		· ·		FAC 3	_ x3=	9	
3.		· ·			_ X4=	15	_
4		· ·		Sum: 104	X 5 =	220	(B)
S		· ·		Juin. 104	_(A)	220	(6)
7		· ·		Prevalence Inde	v — в/л —	2 1 2	
/		· ·		Frevalence mue	- D/A -	2.12	
		= Total	Cover	Hydronhytic Vegetation	n Indicators:		
Shruh Stratum (Plot size: 15' radius)		·····	cover	X Dominance	Test is $> 50\%$		
1.				X Prevalence	Index is ≤ 3.0)	
2.		· ·		Problemati	c Hydrophytic '	Vegetation ¹ (explain)
3.		· ·		X Rapid Test	for Hydrophyti	c Vegetation	
4.		· ·		Morpholog	ical Adaptation	ns	
5.		· ·		¹ Indicators of hydric soil and y	wetland bydrology	must be present	unless
6.				disturbed or problematic.	wetiand nydrology	must be present	, unless
7.				Definitions of Vegetation	on Strata:		
		= Total	Cover				
Herb Stratum (Plot size: 10' radius)				Tree - Woody plants, exclud	ing woody vines, a	pproximately 201	't (6m) or
1. Kyllinga pumila	98	Х	FACW	more in height and 3in (7.6cn	 or larger in diam 	eter at breast he	ight (DBH).
2. Lespedeza repens	3		UPL				
3. Paspalum laeve	3		FAC				
4.				Sapling - Woody plants, ex	cluding woody vine	es, approximately	20ft (6m)
5.				or more in neight and less that	IN 3IN (7.6CM) DBH		
6.							
7		· ·		Charles and the second			
8.		· ·		Snrub - Woody plants, exclute to 6m) in height	Jding woody vines,	, approximately 3	to 20ft (1
9		· ·		to only infleight			
10.		· ·		Horb All borbosous (non	woodu) planta ind	luding hashaaaa	
12		· ·		regardless of size. Includes w	oody plants, except	t woody vines, le	ss than
12.	104	- Total	Cover	approximately 3ft (1m) in hei	ght.		
Woody Vines (Plot size: 30' radius)		- 10181	COVEI				
1							
2		· ·		Woody vine - All woody v	ines, regardless of	height.	
3.		· ·		,	.,		
4.		· ·		Hydrophyti	c		
5.		· ·		Vegetation	า		
		= Total	Cover	Present	?	YES	
Remarks: (If observed, list morphological adaptations b	elow).			.			
Indicator 1 (Rapid Test) present due to dom	inance of FACW or OBL sp	ecies.					
····· · · · · · · · · · · · · · · · ·	····						

- Ahh

Applicative State Executedy State Executedy State Executedy State Description	riojectone.	Mammot	h Caves NP		City/County:	Edmonse	on County		Samp. Date: 10	/1/2018
Interestigation Section, Township, Narge: Narge Locat refer (sear, Narge) Stope (N) 25 Sold Mop Unit: Context Stope Normal Classifier (Sear, Narge) Normal Classifier (Sear, Narge) Sold Mop Unit: Carter Stope Normal Classifier (Sear, Narge) Normal Classifier (Sear, Narge) Normal Classifier (Sear, Narge) Sold Mop Unit: Carter Stope Normal Classifier (Sear, Narge) Normal Classifier (Sear, Narge) Normal Classifier (Sear, Narge) Sub Mop Unit: Carter Stope Normal Classifier (Sear, Narge) Normal Classifier (Sear, Narge) Normal Classifier (Sear, Narge) Sub Mop Unit: Carter Stope Normal Classifier (Sear, Narge) Normal Classifier (Sear, Narge) Normal Classifier (Sear, Narge) Sub Mop Unit: Normal Classifier (Sear, Narge) Normal Classifier (Sear, Narge) Normal Classifier (Sear, Narge) Normal Statistics One or more parameters lacking, Areas is not a wetland. Data point located in a shallow depression, slightly downhill from DP-10. Area is an open field which is not visibly maintained. HVDROLOCY Moread Mydrology Midcators: Aquit's Fase (R13) Stope Classifier (Sear, Narge) Surface Narge) printing Narge (Sear, Narge)	Applicant/Owner:	National	Park Service			State:	Kentucky	Sampling Point	DP	-11
and use in provide set of the set	Investigator(s):	Sean Mu	ray		Section	, Townsh	ip, Range:	NA	<u> </u>	
Serie for Much ()	Landform (hillslope, te	errace, etc.):	Terrace		Local relief	(concave, co	onvex, none):	Concave	Slope (%):	3-5
Bind Multimit Catalogness at team. 2 to be presented togets Optimit Opti	Subregion (LRR or	MLRA):	LRR N; MLRA	La	t: 37.186047		Long:	-77.373135	Datum:	WGS84
Net unable vegetation processing to inter under very Yes (integle paint interimeted and the set of the set o	Soil Map Unit:	Clarkrang	e silt loam, 2 to	o 6 percent slopes		Vaa	(16.00.0)	unlain in Damarka \	NWI Classif.:	Upland
No. Dec. No. Image Image <t< td=""><td>Are Climatic/Hyurol</td><td>il or Hydrol</td><td>ons on the site</td><td>v disturbod?</td><td>year</td><td>res</td><td>(11 110, 92</td><td>Normal (</td><td>Circumstancos?</td><td>Vac</td></t<>	Are Climatic/Hyurol	il or Hydrol	ons on the site	v disturbod?	year	res	(11 110, 92	Normal (Circumstancos?	Vac
Note regression, and introduced, and any productions mod (introduced particular) Note of the regression, and any model of the regression, staget and any model of the regression of the regression, staget and any model of the regression of	Are Vegetation, Sol	il, or Hydrol	ogy significanti	roblematic? No					explain any answe	rs in Romarks)
SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc. imports Supported by Enderson Present? NO International Machines Present? NO Bata point located in a shallow depression, slightly downhill from DP-10. Area is an open field which is not visibly maintained. HVDROLOCY Wetland Hydrology Indicators: Primary locators (minimum of one is required; check III that apply) Secondary Indicators (minimum of two required) Surface Soft Cacks (IMS) Aquatic Flams (IB1) Secondary Indicators (minimum of two required) Surface Soft Cacks (IMS) The Aquatic Flams (IB1) Secondary Indicators (minimum of two required) Surface Soft Cacks (IMS) The Aquatic Flams (IB1) Secondary Indicators (IMS) Secondary Indicators (IMS) Primary Indicators (IMS) Moniput Flams (IMS) Secondary Indicators (IMS) Secondary Indicators (IMS) Surface Soft Cacks (IMS) Moniput Flams (IMS) Secondary Indicators (IMS) Secondary Indicators (IMS) Water Safe Soft Cacks (IMS) Moniput Flams (IMS) Secondary Indicators (IMS) Secondary Indicators (IMS) Water Safe Soft Cacks (IMS) The Aquatic Flams (IS1) Secondary Indicators (IMS) Secondary Indicators (IMS)	Are vegetation, 30	ii, or riyuroi	ogy naturally p	NO NO				(ii fielded,		is in Kennarks.)
No Is This Sample Area Within a Wetland? No Remarks: No Is This Sample Area Within a Wetland? No Remarks: Do no or more parameters lacking, Area is not a wetland. Data point located in a shallow depression, slightly downhill from DP-10. Area is an open field which is not visibly maintained. HVDROLOGY Wetland Hydrology Indicators: Successful and the secondary Indicators (minimum of two required) Firing Water field in the location of two required. Avaatic Farus (103) Sufface Staff (40) Sufface Water (A1) Avaatic Farus (103) Sufface Staff (40) Sufface Staff (40) Sufface Water (A1) Avaatic Farus (103) Sufface Staff (40) Sufface Staff (40) Sufface Water (A1) Avaatic Farus (103) Sufface Staff (40) Sufface Staff (40) Sufface Water (A1) Avaatic Farus (103) Sufface Staff (40) Sufface Staff (40) Sufface Staff (40) Propersite (10) Sufface Staff (40) Sufface Staff (40) Sufface Water (A2) Mo Depth (Inches): Sufface Staff (40) Sufface Staff (40) Muter Staff (40) The Avaatif (40) Sufface Staff (40) Sufface Staff (40) Sufface Staff (40)	SUMMARY OF	FINDING	S - Attach si	te map showing sa	mple point l	ocation	s, transec	cts, important featu	res, etc.	
NO Is This Sample Area Within a Wetland 2 NO Remarks: One or more parameters lacking. Area is not a wetland. Data point located in a shallow depression, slightly downhill from DP-10. Area is an open field which is not visibly maintained. HVDROLOGY Wetland Hydrology Indicators: Secondary Indicators (Initiation of one is required; check all that apply) Secondary Indicators (Initiation of one is required; Check all that apply) Surface Watch (A) Aquatic Faura (B3) Surface Sing Chack (B3) Data point located in hydrology Indicators (Initiations (Initiatity (Initinitiations (Initiations (Initinitiations (Initiations (I	Hydrophytic Vegeta	ation Prese	nt?	NO						
Wetland Hydrology Present? NO RemarkS: Data point located in a shallow depression, slightly downhill from DP-10. Area is an open field which is not visibly maintained. HVDROLOGY Secondary Indicators: Wetland Hydrology Indicators: Secondary Indicators: (minimum of new required). Fight Mater Sill Secondary Indicators: (minimum of new required). Secondary Indicators: Secondary Indicators: (minimum of new required). Hydrology Indicators: Secondary Indicators (minimum of two required). Secondary Indicators: Secondary Indicators (minimum of two required). Hydrology Indicators: Secondary Indicators (minimum of two required). Secondary Indicators: Secondary Indicators (minimum of two required). Secondary Indicators: More Tomepash (20) Depth (mintos). Secondary Indicators: More Tomepash (20) Depth (mintos). Depth (mintos). Secondary Indicators: NO Depth (mintos). Depth (mintos). Depth (mintos). Secondary Indicators of wetland hydrology Present? NO Depth (mintos). Depth (mintos). Secondary Indicators. Remarks: No Depth (mintos). Secondary Indicators. No<	Hydric Soil Present?	?		NO			ls T	This Sample Area With	in a Wetland?	NO
Remarks: Dre or more parameters lacking. Area is not a wetland. Data point located in a shallow depression, slightly downhill from DP-10. Area is an open field which is not visibly maintained. HVDROLOGY Secondary indicators: Primary indicators (minimum of one is required; check all that apply) Secondary indicators (minimum of one is required; diverse field which is not visibly maintained. Startiet Water (A) Aquatic Fama (B3) Surface Water (B1) Drage field which is not visibly maintained. Startiet (A) Aquatic Fama (B3) Description of one is required; diverse (B1) Description of one is required; diverse (B1) Water Marks (B1) Oxided thiteophers on Lining Roots (C3) Dry Second Water Table (A2) Description (D2) Other of model parameters (B1) Other (Fsplain in Remarks) Micro tappend Parameter (D1) Micro tappend Parameter (D2) Intro Media Lawse (B1) Other (Fsplain in Remarks) Micro tappend Present (D2) Micro tappend Parameter (D2) Micro tappend Parameter (D3) Intro Media Present 2 NO Depth (inches): 21 Micro Tappend Parameter (D3) Micro tappend Parameter (D3) Solt Solt Solt field Solt field (D3) Micro tappend Parameter (D3) Micro tappend Parameter (D3) Micro tappend Parameter (D3) Micro tappend Parameter (D3) <td>Wetland Hydrology</td> <td>/ Present?</td> <td></td> <td>NO</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	Wetland Hydrology	/ Present?		NO						
HYDROLOGY Welland Hydrology Indicators: Surface Water (A1) Aquatic Faani (B13) Surface Soli Cracks (B6) High Water Toble (A2) The Aquatic Faani (B13) Surface Soli Cracks (B6) High Water Toble (A2) The Aquatic Faani (B13) Surface Soli Cracks (B6) High Water Toble (A2) The Aquatic Faani (B13) Surface Soli Cracks (B6) Solid Water Mores (B1) Chackee of Reduced for (C4) Surface Soli Cracks (B1) Solid Proposits (B2) Execute on Reduction in Tilled Solis (C6) Surface Solid Cracks (B1) Mater Solid Cracks (B8) Execute on Reduction in Tilled Solis (C6) Surface Varier (C1) Mater Solid Cracks (B8) Execute on Reduction in Tilled Solis (C6) Surface Varier (C1) Surface Varier (C1) Mater Solid Cracks (B8) Execute Reduction in Tilled Solis (C6) Surface Varier (C1) Surface Varier (C1) Mater Solid Cracks (B8) Execute Reduction in Tilled Solis (C6) Surface Varier (C1) Surface Varier (C1) Water Solid Cracks (B8) Execute Reduction in Tilled Solis (C6) Surface Varier (C1) Surface Varier (C1) Water Solid Cracks (B8) Depth (Inches): <u>218</u> Wetland Hydrology Present? NO Surface Varier (B2) Depth (Inc	Remarks:	Data poi	nt located in a	a shallow depression,	slightly down	hill from	DP-10. Ar	ea is an open field whi	ch is not visibly n	naintained.
Wetland Hydrology Indicators: Secondary Indicators: Timary Indicators: Aquatic Fauna (813) Surface Vater (A1) Aquatic Fauna (813) Surface Vater (A1) Aquatic Fauna (813) Surface Vater (A1) Mater Marks (81) Surface Vater (A1) Darlage Pattern (810) Surface Vater (A1) Mater Marks (81) Surface Vater (A1) Presence of Reduced two (C1) Surface Vater Table (A2) Presence of Reduced two (C1) Phy Water Marks (81) Outlet (Faplain in Remarks) Iron Deposits (83) Recent Iron Reduction in Tiled Solis (C5) Not patter fable (A2) Thin Muck Surface (C7) Iron Deposits (83) Other (Faplain in Remarks) Mater Table Present? NO Depth (Inches): <u>0</u> Staruration Present? NO Depth (Inches): <u>18</u> Vater Table Present? NO Depth (Inches): <u>18</u> Vor Patter Reduct Factures Indicators for Problematic Hydric Solis ¹ : Yofile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.) Patt Redox Features Yofile Description: (Descri	HYDROLOGY									
Primary indicators (minimum of one is required; check all that apply) Surface Vire (A) High Water (A) High Wate	Netland Hydrology	/ Indicators						Secondary Indicators (minimum of two re	quired)
Surface Water (A1) Aquatic Fanar (B3) Sparsely Vegetated Concerve Surface (B8) Hey Water Table (A2) True Aquatic Plants (B14) Mark Marks (B1) Surface Water (Marks (B1) Oxidiated Misospheres on Living Roots (C3) Drainage Patterns (B10) Water Marks (B1) Oxidiated Misospheres on Living Roots (C3) Dry Seson Water Table (C2) Suffer Control (B3) Presence of Reduced too (C4) CaryAi(B) Burrows (C8) Ont Deposits (B3) Presence of Reduced too (C4) CaryAi(B) Burrows (C8) I'ron Deposits (B3) Other (Explain in Remarks) Staturation Visible on Aerial (B7) Water Statue Leaves (B9) Other (Explain in Remarks) Mice Cotopagraphic Relief (D4) Water Statue Leaves (B9) Depth (Inches): 18 Staturation Nesent? NO Depth (Inches): 18 Varier Table Present? NO Depth (Inches): 18 SoliL Tork (Marks) 518 Wettand Hydrology Present? NO SoliL Color (molst) % Type? Loc? Texture Remarks SoliL Color (molst) % Type? Loc? Texture Remarks Solid Startation Northerabe Reduced Mater, M5-Masked Sand Grains. * Locarian Pu-Pore Lining, M-Matrix. Type: C-concentration, DrDepletion, IAM* Masked Sa	rimary Indicators ((minimum o	of one is require	ed; check all that apply)				Surface Soil	Cracks (B6)	, ,
High Water Table (A2) The Aquate Plants (B4) Drainage Patterns (B10) Saturation (A3) Oddited Rhosphers on Uving Roots (C3) Drainage Patterns (B10) Water Murks (B1) Oddited Rhosphers on Uving Roots (C3) Dr.Yesson Water Table (A2) Bediment Deposits (B3) Recent ron Reduction in Tilled Solis (C6) Saturation Visible on Arail (D7) Water Stained Leaves (B1) Other (Explain in Remarks) Caraylish Barrows (C3) Inundation Visible on Arail (D7) Other (Explain in Remarks) Comorphic Position (D2) Water Stained Leaves (B1) Other (Explain in Remarks) Microtopographic Relief (D4) Water Stained Leaves (B1) Depth (inches): 0 Water Table Present? NO Depth (inches): 0 Nor Tomine Vision (C3) Nor Joint Nick Surface (C3) Nor Joint Nick Surface (C3) Nor Tomine Vision (C3) Depth (inches): 0 Nor Tomine Vision (C3) Depth (inches): 0 Nor Tomine Vision (C3) Nor Yania Nor Tomine Vision (C3) Nor Tomine Vision (C3) Nor Tomine Vision (C3) Nor Tomine Vision (C3) Solid Nor Yania Recorded Data (Stream gauge, monitoring well, aerial photos, previous inspections), if available: Yania Nor Yania Recorded C3 Nor Yania Solid Color (moist)	Surface Wate	er (A1)		Aquatic Fauna (B1	.3)			Sparsely Ve	getated Concave Surf	ace (B8)
Suturation (A3) Hydrogen Sulfate Odor (C1) Moss Trim Lines (B16) Water Mixer (B14) Dynamics on Living Roots (C3) Dynamics on Living Roots (C3) Sediment Deposits (B13) Presence of Reduced trin (C4) Dynamics on Kills (C2) Alga Mat or Crust (B4) Thin Muck Sulfate (C7) Saturation (K4) Iron Deposits (B5) Other (Explain in Remarks) Generoptic Position (D2) Inudation Visible on Aerial (B7) Water State (Laws (B9) FAC Neutral Test (D5) Field Observations: O Depth (inches): O Surface Water Present? NO Depth (inches): 118 Water Table Present? NO Depth (inches): 118 SollL Social (Stremg upge, monitoring well, aerial photos) 129 NO Folice Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.) Permarks: No primary or secondary indicators of wetland hydrology present; parameter is not met. SollL Color (moist) % Color (moist) % Type' Loc ² Type: Color (moist) % Color (moist) % Type' Loc ² Type: Color (moist) %	High Water Ta	able (A2)		True Aquatic Plan	ts (B14)			Drainage Pa	tterns (B10)	
Water Marks (B1) Oxidized Minisopheres on LVing Roots (C3) Dry-Season Water Table (C2) Sediment Deposits (B3) Recent tron Reduction in Tiled Solis (C6) Suturation Visible on Aerial Imagery (C9) Alga Mator Crust (B4) Thin Muck Surface (C7) Suturation Visible on Aerial Imagery (C9) Inundator Wisble on Aerial (B7) Other (Explain in Remarks) Geomorphic Position (D2) Inundator Wisble on Aerial (B7) Depth (inches): 0 Water Table Present? NO Depth (inches): 18 Sediment Document Present? NO Depth (inches): 18 Solid No Depth (inches): 18 Wetland Hydrology Present? NO Solid No Depth (inches): 18 Wetland Hydrology Present? NO Solid No Depth (inches): 18 18 Solid Solid Solid No Depth (inches): 18 18 Solid Sol	Saturation (AS	3)		Hydrogen Sulfide	Odor (C1)			Moss Trim L	ines (B16)	
sediment Deposits (82)	Water Marks	(B1)		Oxidized Rhizosph	eres on Living Ro	ots (C3)		Dry-Season	Water Table (C2)	
Drift Deposits (83) Recent toon Reduction in Tilled Solis (C6) Saturation Visible on Acrial Imagery (C9) Mapel Mater Ortus (84) Drim Muck Surface (77) Saturation Visible on Acrial Imagery (C9) Immodation Visible on Acrial (87) Drim Muck Surface (77) Saturation Visible on Acrial Imagery (C9) Immodation Visible on Acrial (87) Depth (Inches): 0 Saturation Visible on Acrial Imagery (C9) Water Stained Leaves (89) FAC-Neutral Test (D5) Microtopographic Relef (1 Acia) Microtopographic Relef (1 Acia) Water Table Present? NO Depth (Inches): 138 Wetland Hydrology Present? NO Depth (Inches): 138 Wetland Hydrology Present? NO Mo Peth (Inches): 100 Solid No Depth (Inches): 138 Wetland Hydrology Present? NO Depth (Inches): 138 Wetland Hydrology Present? NO NO Solid No Depth (Inches): 160 No No Depth (Inches): 138 Wetland Hydrology Present? NO Solid Matrix K Remarks No No No Torelibe scription: Depth (Inches):	Sediment Dep	oosits (B2)		Presence of Reduc	ced Iron (C4)			Crayfish Bur	rows (C8)	
Again Mater Cruss (B4) Thim Mark Surface (C7) Stundted or Stressed Plants (D1) Inundation Visible on Aerial (B7) Coher (Explain in Remarks) Geromorphic Position (D2) Mater Stated Leaves (B9) Pac-Neutral Test (D5) Pac-Neutral Test (D5) Field Observations: Doppht (Inches): <u>138</u> Wetland Hydrology Present? NO Depth (Inches): <u>138</u> Wetland Hydrology Present? NO Depth (Inches): <u>100</u> Depth (Inches): <u>138</u> Wetland Hydrology Present? NO Depth (Inches): <u>100</u> Secrifice Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: No Present? NO Present? NO Solid Matrix Redox Features Fact-Neutral Test (D5) Remarks: No Presenter Remarks Solid Ocior (moist) % Color (moist) % Type ¹ Loc ² Texture Remarks -1 Ocior (moist) % Color (moist) % Type ¹ Loc ² Texture Remarks -1 Ocior (moist) % Color (moist) % Type ¹ Loc ²	Drift Deposits	s (B3)		Recent Iron Reduc	tion in Tilled Soils	s (C6)		Saturation \	isible on Aerial Imag	ery (C9)
Incord Deposition (B2) Other (Explain in Remarks) Geomorphic Position (D2) Water Stained Leaves (B9) PAC-Neutral Test (D5) Microtopgraphic Relified (PA) Water Stained Leaves (B9) Depth (Inches): 0 PAC-Neutral Test (D5) Water Stained Leaves (B9) Depth (Inches): 0 Wetland Hydrology Present? NO Water Table Present? NO Depth (Inches): 18 Wetland Hydrology Present? NO Depth (Inches): 18 Wetland Hydrology Present? NO NO NO Depth (Inches): 18 Wetland Hydrology Present? NO NO Depth (Inches): 18 Wetland Hydrology Present? NO NO Depth (Inches): 18 Vetland Hydrology Present? NO NO Depth (Inches): 18 Vetland Hydrology Present? NO NO SOIL Indicators of wetland hydrology present; parameter is not met. NO Indicators. Indicators. Prefit Description: (Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.) Indicators. Indicators. Indicators. Type: Concentration, Drobpletion, RM-Reduce	Algal Mat or C	Crust (B4)		Thin Muck Surface	e (C7)			Stunted or S	stressed Plants (D1)	
Initindation Visible on Aerial [87] Microtopographic Relief (DA) Water-State Haves [89] FAC-Neutral Test (DS) Field Observations: FAC-Neutral Test (DS) water Stable Present? NO Depth (inches): >18 Wetland Hydrology Present? NO SOIL Profile Description: (Description: Checribe to the depth needed to document the indicator or confirm the absence of indicators.) Pertime Matrix Remarks Color (moist) 418 2.5Y 5/3 85 10YR 3/5 15 c p clay Dam Type: C-Concentration, D-Depletion, RM-Reduced Matrix, MS-Masked Sand Grains. "location: PL-Fore Lining, M-Matrix. Hydroic Soill Indicators: Indicators fo	Iron Deposits	(B5)		Other (Explain in F	Remarks)			Geomorphic	Position (D2)	
	Inundation Vis	sible on Aeri	al (B7)					Microtopog	raphic Relief (D4)	
Type: C-Concentration, M-Beption, MA-Reduced Matrix, MS-Masked Sand Grans. *Location: PL-Proteining, MM-Matrix. Type: C-Concentration, D-Depietion, MA-Reduced Matrix, MS-Masked Sand Grans. *Location: PL-Proteining, MM-Matrix. Type: C-Concentration, D-Depietion, MA-Reduced Matrix, MS-Masked Sand Grans. *Location: PL-Proteining, MM-Matrix. Type: C-Concentration, D-Depietion, MA-Reduced Matrix, MS-Masked Sand Grans. *Location: PL-Proteining, MM-Matrix. Type: C-Concentration, D-Depietion, MA-Reduced Matrix, MS-Masked Sand Grans. *Location: PL-Proteining, MM-Matrix. Type: C-Concentration, D-Depietion, MA-Reduced Matrix, MS-Masked Sand Grans. *Location: PL-Proteining, MM-Matrix. Histosic (A1) Dark Surface (S7) Cost Surface (S1) Histosic (A1) Dark Surface (S1) Cost Surface (S1) Histosic (A1) Depieted Matrix (S1) Depieted Matrix (S1) Back Histis (A3) Displetion RM-Reduced Matrix (S1) Depieted Matrix (S1) Back Histis (A3) Depieted Matrix (S1) Depieted Matrix (S1) Depieted Matrix (S1) Strainfed Matrix (S4) Depieted Matrix (Water-Stained	d Leaves (B9)					FAC-Neutra	Test (D5)	
Surface Water Present? NO Depth (inches): 318 Wetland Hydrology Present? NO Alter Table Present? NO Depth (inches): 318 Wetland Hydrology Present? NO Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: No No No Remarks: No primary or secondary indicators of wetland hydrology present; parameter is not met. Soll Stoll Troflie Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.) Remarks Remarks Yop (in (moist)) % Type ¹ Loc ² Texture Remarks (in) Color (moist) % Type ¹ Loc ² Texture Remarks 418 2.57 S/3 85 10YR 3/6 15 c p claam	ield Observations:	:								
Water Table Present? NO Depth (inches): 13 Wetland Hydrology Present? NO Descripte Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: No No No Description: Concentration, Dispetition (Description: Concentration), if available: No No No SOIL Topic Description: Concentration, Dispetition: (Describe to the depth needed to document the indicator or confirm the absence of indicators.) Remarks: Texture Remarks Ord OVR A/2 100 % Color (moist) % Type ¹ Loc ² Texture Remarks Type: C-Concentration, Di-Depletion, RM-Reduced Matrix, MS-Masked Sand Grains. * <td>Surface Water Pres</td> <td>sent?</td> <td>NO</td> <td>Depth (inches</td> <td>): <u> </u></td> <td></td> <td></td> <td></td> <td></td> <td></td>	Surface Water Pres	sent?	NO	Depth (inches): <u> </u>					
Saturation Present? NO Depth (inches): >18 Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: Remarks: No primary or secondary indicators of wetland hydrology present; parameter is not met. SOIL Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.) Pepth Matrix Redox Features (in) Color (moist) % Type ¹ 0.4 100r (moist) % Type ¹ 4.18 2.5Y 5/3 85 100rR 3/6 15 c p clay loam Type: C-Concentration, D-Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. *Location: PL=Pore Lining, M=Matrix. *Location: PL=Pore Lining, M=Matrix. Histics Explored (A1) Dark Surface (57) 2 cm Muck (A10) Color (Thist) 2 cm Muck (A10) Histic Explored (A2) Polyvalue Below Surface (53) Depleted Matrix (F3) Color (Hist) 2 cm Muck (A10) Startified Layers (A5) Depleted Matrix (F3) Depleted Matrix (F3) Color (Hist) 3 indicators of hydrophytic vegetation and uset and hydrology must be present, unless disturbed or problematic. Stripted Matrix (S4) Umbric Surface (F12) Ve	Nater Table Preser	nt?	NO	Depth (inches): >18		We	etland Hydrology Present	?	NO
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: Remarks: No primary or secondary indicators of wetland hydrology present; parameter is not met. SOIL Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.) Depth Matrix Redox Features (in) Color (moist) % Color (moist) 4.18 2.5Y 5/3 85 10YR 3/6 15 c p clay loam Type: C-Concentration, D-Depletion, RM-Reduced Matrix, MS-Masked Sand Grains. "Loco" loam	Saturation Present?	?	NO	Depth (inches	;): > 18					
Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.) Depth Matrix Color (moist) % Color (moist) % Type ¹ Loc ² Texture Remarks 0.4 10YR 4/2 100 Color (moist) % Color (moist) % Type ¹ Loc ² Texture Remarks loam A18 2.5Y 5/3 85 10YR 3/6 15 c p clay loam Type: C-Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. "Type: C-Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. "Type: C-Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. Hydric Soil Indicators: Histosol (A1) Dark Surface (S7) Histose Epipedon (A2) Polyvalue Below Surface (S8) Coast Prairie Redox (A16) Black Histic (A3) Thin Dark Surface (S9) Coast Prairie Redox (A16) Depleted Matrix (F2) Very Shallow Dark Surface (TF12) Stratified Layers (A5) Depleted Dark Surface (F7) Thick Dark Surface (A11) Depleted Dark Surface (F7) Thick Dark Surface (A12) Redox Deryseins (F8) Sandy Redox (S5) Piedmont Floodplain Soils (F19) Stripped Matrix (S6) Red Parent Material (F21) Remarks: No hydric soil indicators present and soil does not meet NTCHS definition of hydric soil; parameter is not met.	SOIL									
Matrix Reudy Peatures (n) Color (moist) % Type ¹ Loc ² Texture Remarks 0-4 10YR 4/2 100 % Type ¹ Loc ² Texture Remarks 4-18 2.5Y 5/3 85 10YR 3/6 15 c p clayloam	Profile Description:	: (Describe t	o the depth ne	eded to document the i	ndicator or conf	firm the a	bsence of in	ndicators.)		
(in) Color (moist) % Color (moist) % Lype Loc Texture Remarks 0-4 107R 4/2 100 100 0am 0am 0am 0am 4-18 2.5Y 5/3 85 10YR 3/6 15 c p clay loam 0am Type: C-Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ² Location: PL=Pore Lining, M=Matrix. Hydric Soil Indicators: Indicators for Problematic Hydric Soils ³ : Indicators for Problematic Hydric Soils ³ : Histosci (A1) Dark Surface (S7) 2 cm Muck (A10) 2 cm Muck (A10) Histic Epipedon (A2) Polyvalue Below Surface (S8) Coast Prairie Redox (A16) Black Histic (A3) Thin Dark Surface (S7) Very Shallow Dark Surface (T12) Stratified Layers (A5) Depleted Dark Surface (F6) Other (Explain in Remarks) 2cm Muck (A10) Redox Dark Surface (F7) 3 Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic. Sandy Mucky Mineral (S1) Iron-Marganese Masses (F12) 3 Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic. Sandy Redox (S5) Piedmont Floodplain Soils (F19) </td <td>Deptn</td> <td>IVIATI</td> <td></td> <td>K</td> <td>edox Features</td> <td>- 1</td> <td>. 2</td> <td></td> <td>_</td> <td></td>	Deptn	IVIATI		K	edox Features	- 1	. 2		_	
0-4 100'K 4/2 100 Ioam 4-18 2.5Y 5/3 85 10YR 3/6 15 c p clay loam "Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. *Location: PL=Pore Lining, M=Matrix. Hydric Soil Indicators: Indicators for Problematic Hydric Soils ³ : Histosol (A1) Dark Surface (S7) 2 cm Muck (A10) Histic Epipedon (A2) Polyvalue Below Surface (S8) Coast Prairie Redox (A16) Black Histic (A3) Thin Dark Surface (S9) Piedmont Floodplain Soils (F19) Hydrogen Suffade (A4) Loamy Gleyed Matrix (F2) Very Shallow Dark Surface (TF12) Stratified Layers (A5) Depleted Matrix (F3) Other (Explain in Remarks) Zorm Muck (A10) Redox Depressions (F8) 3 Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic. Sandy Mucky Mineral (S1) Umbric Surface (F13) disturbed or problematic. Stripped Matrix (S6) Red Parent Material (F21) Hydric Soil Present? Remarks: No hydric soil indicators present and soil does not meet NTCHS definition of hydric soil; parameter is not met.	(in) Color ((moist)		Color (moist)	%	Туре*	Loc	Texture	Rer	narks
Prior Prior Prior Prior Prior Prior Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ³ Location: PL=Pore Lining, M=Matrix. Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ³ Location: PL=Pore Lining, M=Matrix. Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ³ Location: PL=Pore Lining, M=Matrix. Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ³ Location: PL=Pore Lining, M=Matrix. Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ³ Location: PL=Pore Lining, M=Matrix. Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ³ Location: PL=Pore Lining, M=Matrix. Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ³ Location: PL=Pore Lining, M=Matrix. Hydric Soil (A1) Dark Surface (S7) ² crm Muck (A10) Histos (A1) Dark Surface (S8) ² crm Muck (A10) Hydrogen Sulfide (A4) Loamy Gleyed Matrix (F3) ³ Indicators of hydrophytic vegetation and wetara functions of hydrophytic vegetation and wetara functions of soils (F19) Thick Dark Surface (A12) Red A Depressions (F8)	0-4 10YH 1-18 2.5V	K 4/2	100	10VP 3/6			<u> </u>	loam clav loam		
Type: C-Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ² Location: PL=Pore Lining, M=Matrix. Hydric Soil Indicators: Indicators for Problematic Hydric Soils ³ : Histosol (A1) Dark Surface (S7) Histosol (A2) Polyvalue Below Surface (S8) Black Histic (A3) Thin Dark Surface (S9) Hydrige Sulfide (A4) Loamy Gleyed Matrix (F2) Stratified Layers (A5) Depleted Matrix (F3) Depleted Matrix (F3) Depleted Matrix (F3) Depleted Bark Surface (A10) Redox Dark Surface (F6) Depleted Bark Surface (A11) Depleted Dark Surface (F7) Thick Dark Surface (A12) Redox Depressions (F8) Sandy Mucky Mineral (S1) Irron-Manganese Masses (F12) Sandy Gleyed Matrix (S4) Umbric Surface (F13) Sandy Redox (S5) Piedmont Floodplain Soils (F19) Stripped Matrix (S6) Red Parent Material (F21) Restrictive Layer (if observed): Type: Type: Deplettic Soil Present? Deplettic Layers Hydric Soil Present? Medra Ks: No hydric soil indicators present and soil does not meet NTCHS definition of hydric soil; parameter is not met.	4-10 2.51	1 3/ 3		1011(5/0			P			
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Histoson Inducators. Indicators for Problematic Hydric Solls": Histoson (A1) Dark Surface (S7) 2 cm Muck (A10) Histic Epipedon (A2) Polyvalue Below Surface (S8) Coast Prairie Redox (A16) Black Histic (A3) Thin Dark Surface (S9) Piedmont Floodplain Soils (F19) Hydrogen Sulfide (A4) Loamy Gleved Matrix (F2) Very Shallow Dark Surface (TF12) Stratified Layers (A5) Depleted Matrix (F3) Other (Explain in Remarks) Zcm Muck (A10) Redox Dark Surface (F6) Peleted Dark Surface (F7) Thick Dark Surface (A12) Redox Depressions (F8) 3 Indicators of hydrophytic vegetation and wetland hydrology must be present, unless Sandy Mucky Mineral (S1) Uron-Manganese Masses (F12) wetland hydrology must be present, unless Sandy Redox (S5) Piedmont Floodplain Soils (F19) disturbed or problematic. Stripped Matrix (S6) Red Parent Material (F21) Hydric Soil Present? NO Lestrictive Layer (if observed): Type: Hydric Soil Indicators present and soil does not meet NTCHS definition of hydric soil; parameter is not met.	hydric Soil Indicate	.,						Indicators for Deel-	atio Hudris C - 11-3	
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Hydrogen Sulfide (A4) Loamy Gleyed Matrix (F2) Very Shallow Dark Surface (TF12) Stratified Layers (A5) Depleted Matrix (F3) Other (Explain in Remarks) 2cm Muck (A10) Redox Dark Surface (F6) Depleted Below Dark Surface (A11) Depleted Dark Surface (F7) Thick Dark Surface (A12) Redox Depressions (F8) ³ Indicators of hydrophytic vegetation and sold openessions (F12) Sandy Mucky Mineral (S1) Iron-Manganese Masses (F12) wetland hydrology must be present, unless disturbed or problematic. Sandy Redox (S5) Piedmont Floodplain Soils (F19) disturbed or problematic. Stripped Matrix (S6) Red Parent Material (F21) Hydric Soil Present? No hydric soil indicators present and soil does not meet NTCHS definition of hydric soil; parameter is not met.	Black Histic (A	43)		Thin Dark	Surface (S9)			Piedmont Fl	oodplain Soils (F19)	
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Inick Dark Surface (A12) Redox Depressions (r8) * Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic. Sandy Gleyed Matrix (S4) Umbric Surface (F13) disturbed or problematic. Sandy Redox (S5) Piedmont Floodplain Soils (F19) disturbed or problematic. Stripped Matrix (S6) Red Parent Material (F21) Hydric Soil Present? NO Remarks: No hydric soil indicators present and soil does not meet NTCHS definition of hydric soil; parameter is not met. No	Stratified Laye 2cm Muck (A1	D 1 C 1	ace (A11)		Dark Surface (F7)			2		
Sandy Modely Millet al (S1) in Off-MidligateSe Masses (F12) wetland hydrology must be present, unless Sandy Gleyed Matrix (S4) Umbric Surface (F13) disturbed or problematic. Sandy Redox (S5) Piedmont Floodplain Soils (F19) disturbed or problematic. Stripped Matrix (S6) Red Parent Material (F21) Hydric Soil Present? Restrictive Layer (if observed): Type: Hydric Soil Present? NO Depth (inches): No hydric soil indicators present and soil does not meet NTCHS definition of hydric soil; parameter is not met. No	Stratified Laye 2cm Muck (A1 Depleted Belo	ow Dark Surf		HOROV DOP	nessions (F8)			Indicators	of hydrophytic vegeta	ition and
Sandy Greece Matrix (Sa) Officit Surface (F15) disturbed or problematic. Sandy Redox (S5) Piedmont Floodplain Soils (F19) Red Parent Material (F21) Restrictive Layer (if observed): Type: Hydric Soil Present? NO Depth (inches): No hydric soil indicators present and soil does not meet NTCHS definition of hydric soil; parameter is not met. No	Stratified Laye 2cm Muck (A1 Depleted Belo Thick Dark Sur	ow Dark Surf rface (A12)		Redox Dep	anoco Maccas /54	2)				
	Stratified Laye 2cm Muck (A1 Depleted Belc Thick Dark Sur Sandy Mucky	ow Dark Surf rface (A12) Mineral (S1)		Iron-Mang	ganese Masses (F1	12)		wetland hyd	Irology must be prese	nt, unless
Restrictive Layer (if observed): Type: Depth (inches): Remarks: No hydric soil indicators present and soil does not meet NTCHS definition of hydric soil; parameter is not met.	Stratified Laye 2cm Muck (A1 Depleted Belc Thick Dark Sur Sandy Mucky Sandy Gleyed	bw Dark Surf rface (A12) Mineral (S1) Matrix (S4)		Iron-Mang Umbric Su	ganese Masses (F1 Irface (F13)	12)		wetland hyd disturbed or	Irology must be prese problematic.	nt, unless
Restrictive Layer (if observed): Type: Depth (inches): Remarks: No hydric soil indicators present and soil does not meet NTCHS definition of hydric soil; parameter is not met.	Stratified Layr 2cm Muck (Al Depleted Belc Thick Dark Su Sandy Mucky Sandy Gleyed Sandy Redox (ow Dark Surf rface (A12) Mineral (S1) Matrix (S4) (S5) rix (S6)		Iron-Mang Umbric Su Piedmont	ganese Masses (F1 Irface (F13) Floodplain Soils (I	12) F19)		wetland hyd disturbed ol	rology must be prese problematic.	nt, unless
Hydric Soil Present? NO Depth (inches):	Stratified Layr 2cm Muck (A: Depleted Belc Thick Dark Sun Sandy Mucky Sandy Gleyed Sandy Redox (Stripped Matr	ow Dark Surf rface (A12) Mineral (S1) Matrix (S4) (S5) rix (S6)		Iron-Mang Umbric Su Piedmont Red Paren	anese Masses (F1 rface (F13) Floodplain Soils (I t Material (F21)	12) F19)		wetland hyd	Irology must be prese • problematic.	nt, unless
Remarks: No hydric soil indicators present and soil does not meet NTCHS definition of hydric soil; parameter is not met.	Stratified Layr 2cm Muck (A: Depleted Belc Thick Dark Sun Sandy Mucky Sandy Gleyed Sandy Redox (Stripped Matr Restrictive Layer (if	ow Dark Surf rface (A12) Mineral (S1) Matrix (S4) (S5) rix (S6)		Iron-Mang Umbric Su Piedmont Red Paren	anese Masses (F1 rface (F13) Floodplain Soils (I t Material (F21)	12) F19)		wetland hyd disturbed or	rology must be prese problematic.	nt, unless
No nyaric soil indicators present and soil does not meet NICHS definition of hydric soil; parameter is not met.	Stratified Layr 2cm Muck (A: Depleted Belc Thick Dark Sun Sandy Mucky Sandy Gleyed Sandy Redox (Stripped Matr Restrictive Layer (if Type: Death (inclust)	ow Dark Surf rface (A12) Mineral (S1) Matrix (S4) (S5) rix (S6)		Iron-Mang Umbric Su Piedmont Red Paren	anese Masses (F1 rface (F13) Floodplain Soils (I t Material (F21)	12) F19)		wetland hyc disturbed or Hydr	irology must be prese problematic.	nt, unless
	Stratified Layr 2cm Muck (A: Depleted Belc Thick Dark Su Sandy Mucky Sandy Gleyed Sandy Redox (Stripped Matr Restrictive Layer (if Type: Depth (inches):	ow Dark Surf rface (A12) Mineral (S1) Matrix (S4) (S5) rix (S6)		Iredox Dej Iron-Manş Umbric Suu Piedmont Red Paren	ganese Masses (F1 rface (F13) Floodplain Soils (I t Material (F21)	12) F19)	6	wetland hyc disturbed or Hydr	irology must be prese problematic.	nt, unless



			Absolute	Dom.	Indicator				
Tree Stratum	(Plot size:	30' radius)	% Cover	Sp?	Status*	Dominance Test W	orksheet:		
1.		ŕ				# Dominants OBL.	ACW. FAC:	ο	(A)
2						,	- / -		_``
3						# Dominants across	all strata.	1	(B)
J							s all strata.	1	_(b)
4.								•••	(. (.)
5.						% Dominants OBL,	FACW, FAC:	0%	(A/B)
6.									
7						Prevalence Index V	Vorksheet:		
				= Tota	l Cover	Total % Cover o	f:	Multiply By	:
Sapling Stratum	(Plot size:	30' radius)				OBL	x 1 =		
1.	-					FACW 9	x 2 =	18	_
2.						FAC	x 3 =		
3						FACIL 10	0 × 4 =	400	_
۵. ۸							×5-		_
						Sum: 10	<u> </u>	110	(D)
J						Sum. 10	9 (A)	410	(D)
6.									
7						Prevalence I	ndex = B/A =	3.83	_
				= Tota	l Cover	Hydrophytic Veget	ation Indicators:		
Shrub Stratum	(Plot size:	15' radius)				Domina	ance Test is > 50%		
1.	-					Prevale	ence Index is <= 3.0)	
2.						Probler	matic Hydrophytic	Vegetation ¹ (e	explain)
3.						Rapid T	est for Hydrophyt	ic Vegetation	
4						Mornh	ological Adaptatio	ns	
5							ological / lauptatio	15	
5. c						Indicators of hydric soil	and wetland hydrology	must be present	, unless
o						Definitions of Vers	c.		
7						Definitions of Vege	tation Strata:		
	(=)			= Tota	Cover				
Herb Stratum	(Plot size:	10' radius				Iree - Woody plants, e	xcluding woody vines, a	pproximately 20f	t (6m) or
1. Poa prat	ensis		85	<u> </u>	FACU	more in neight and sin (7.6cm) or larger in diam	leter at breast rie	ıgnı (рвп).
2. Glechom	a hederacea		15		FACU				
3. Persicari	a maculosa		3		FACW				
4. Juncus di	ichotomus		3		FACW	Sapling - Woody plant	s, excluding woody vin	es, approximately	20ft (6m)
5. Coleatae	nia rigidula		3		FACW	or more in height and le	ss than 3in (7.6cm) DBH	1.	
6.									
7.									
8.						Shrub - Woody plants	excluding woody vines	, approximately 3	to 20ft (1
9						to 6m) in height.	о, ,		
10									
10.						Horb All barbassaus	(non woods) plants in	luding boshoooo	
11.						regardless of size. Includ	les woody plants, excen	t woody vines. le	ss than
12.						approximately 3ft (1m) i	n height.	,	
			109	= Iota	Cover				
Woody Vines	(Plot size:	30' radius							
1									
2.						Woody vine - All woo	ody vines, regardless of	height.	
3.									
4.						Hydrop	hytic		
5.						Vegeta	ation		
				= Tota	l Cover	Pres	ent?	NO	
									_
Remarks: (If ohse)	ved list mornh	ological adaptations below)				Į			
		ion indicators and anti-							
No nyaroj	phytic vegeta	tion indicators present; pa	frameter is not met.						

- Chb

Applicant/Owner: Nampling Point: Unrestigator(5): Sean Murray Section; Township, Range: NA Landform (nishape, termae, etc); Terrace Local relief (concex, concer, rand); Conceve Stopping (IR Normal); Nampling Point; Soli Map Unit: Clarkange silt Loam, 2 to 6 percent slopes 37.3801 Long: -77.373135 NVU Clarkange silt Loam, 2 to 6 percent slopes NVU Clarkange silt Loam, 2 to 6 percent slopes NVU Clarkange silt Loam, 2 to 6 percent slopes NVU Clarkange silt Loam, 2 to 6 percent slopes NVU Clarkange silt Loam, 2 to 6 percent slopes NVU Clarkange silt Loam, 2 to 6 percent slopes NVU Clarkange silt Loam, 2 to 6 percent slopes NVU Clarkange silt Loam, 2 to 6 percent slopes NVU Clarkange silt Loam, 2 to 6 percent slopes NVU Clarkange silt Loam, 2 to 6 percent slopes NVU Clarkange silt Loam, 2 to 6 percent slopes NVU Clarkange silt Loam, 2 to 77.373135	DP-12 i): 0 to 2 with the second se
Investigator(s): Sean Murray Section, Township, Range: NA Solution (Concave) Slope Subregion (LRR or MLRA: LTR N; MLRA 120A Lat: 37.18601 Long:77.373133 D Ung:77.373133 D VIV (Clas Are climatic/hydrologi; conditions on the site typical for this time of year? Yes (If no, explain in herraks.) Are Vegetation, Soli, or Hydrology instinctindly disturbed? No Are Vegetation Present? YES Is This Sample Area Within a Wetla Hydrology Present? YES Is This Sample Area Within a Wetlat Hydrology Present? YES Area is not a wetland. Data point is located at the upper edge of a shallow depression. Sufface Water (A1) Aquatic Faura (B13) Sparsely Vegetated Cons Present? Yes Area (Vice Constant Faura (B13) Sparsely Vegetated Cons Present? Yes Area (Vice Constant Faura (B13) Sparsely Vegetated Cons Sparsely Vegetated Cons (B10) Sufface Soli Crack (B6) Sufface Cor (Cl3) Dry Season Water Table (A2) Presence of Reduce Cons (Cl3) Dry Season Water Table (A2) Presence of Reduce Cons (Cl3) Dry Season Water Table (A2) Presence of Reduce Cons (Cl4) Sutatuton Stable on Area (S1) Mars Time (S2) Mars (S1) Dry Season Water Table (A2) Present? Mo Depth (Inches): Table On Area (S1) Mars Time (S1) Mars Time (S2) Mars (S1) Mars Time (S2) Mars (S1) Mars Time (S2) Mars (S1) Mars (6): 0 to 2 m: WGS84 f.: Upland s? Yes answers in Remarks d? NO wo required)
Landtorm (nikliops terrace, etc): Terrace Local Pilefel (conceve, concer, none): Conceve Slop bead Soli Map Unit: Cankrange sill loam, 2 to 6 percent slopes MWI Clait Soli Map Unit: Cankrange sill loam, 2 to 6 percent slopes MWI Clait Are Vegetation, Soli, or Hydrology significantly disturbed? No MVI Clait Are Vegetation, Soli, or Hydrology significantly disturbed? No Mo Mo SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc. Hydrogoly present? YES Hydro Soli Present? NO Is This Sample Area Within a Wetla Wetland Hydrology Present? YES Is This Sample Area Within a Wetla Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) Secondary Indicators (minimum of Saturation Nyteine solitic Mode (Cl) Surface Wetland Hydrology Indicators: Order or more parameters lacking. Area is not a wetland. Data point is located at the upper edge of a shallow depression. HYDROLOGY Wetland Hydrology Indicators: Mo Saturation Primary Indicators (minimum of one is required; check all that apply) Secondary Indicators (minimum of Saturation Privace (Fauchece (Cl)) Saturation Privace (Saturation Privace (Saturation Privace (Saturation Privace (Saturation Privace (Sat	6): 0 to 2 m: WGS84 if.: Upland s? Yes answers in Remarks d? NO wo required)
Subregion (Link or MiLAN): LINK NULLA 120A Lat: 37.28001 Long://27.21.315 Lat Subregion (Link or MiLAN): LINK NULLA 120A Lat: 37.28001 Long://27.21.315 Will Claix Are climatic/hydrologic conditions on the site typical for this time of year? Yes (If no, explain in Remarks). Are Vegetation, Soil, or Hydrology inducating tabutubed? No SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc. Hydrophytic VegEINDINGS - Attach site map showing sample point locations, transects, important features, etc. Hydrophytic VegEINDINGS - Attach site map showing sample point locations, transects, important features, etc. Hydrophytic VegEINDINGS - Attach site map showing sample point locations, transects, important features, etc. Hydrophytic VegEINDINGS - Attach site map showing sample point locations, transects, important features, etc. Hydrophytic VegEINDINGS - Attach site map showing sample point locations, transects, important features, etc. Hydrophytic VegEINDINGS - Attach site map showing sample point locations, transects, important features, etc. Hydrophytic VegEINDINGS - Attach site map showing sample point locations, transects, important features, etc. Hydrophytic VegEINDINGS - Attach site map showing sample point locations, transects, important features, etc. Hydrophytic VegEINDINGS - Attach site map showing sample point locations, transects, important features, etc. Hydrophytic VegEINDINGS - Attach site map showing sample point locations, transects, important features, etc. Hydrophytic VegEINDINGS - Attach site map showing sample point locations, transects, important features, etc. Hydrophytic VegEINDINGS - Attach site map showing sample point locations, transects, important set (minimum of one is required; check all that apply) Surface Water (A1) Present? Mydra dual mater crart (A2) Trave Austic Phytic	m: WGS84 if.: Upland s? Yes answers in Remarks d? NO wo required)
Soft Hag Drift, Carry Los percentary Yes (If no, explain in Remarks.) Normal Circumstan Are Vegetation, Soli, or Hydrology significantly disturbed? No Normal Circumstan Are Vegetation, Soli, or Hydrology anturally problematic? No Normal Circumstan Are Vegetation, Soli, or Hydrology anturally problematic? No Normal Circumstan Are Vegetation, Soli, or Hydrology naturally problematic? No Normal Circumstan Are Vegetation, Soli, or Hydrology naturally problematic? No No <td>is? Yes answers in Remarks d? <u>NO</u></td>	is? Yes answers in Remarks d? <u>NO</u>
Are Vegetation, Soli, or Hydrology significantly disturbed? No	is? Yes answers in Remarks d? <u>NO</u> wo required)
Are Vegetation, Soil, or Hydrology naturally problematic? No (if needed, explain an SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc. Hydrophytic Vegetation Present? YES Netting Sufficient State No Is This Sample Area Within a Wetla Wetland Hydrology Present? YES Is This Sample Area Within a Wetla Wetland Hydrology Indicators: Data point is located at the upper edge of a shallow depression. Surface Water (A) Primary Indicators (minimum of one is required; check all that apply) Secondary Indicators (minimum of Surface Soil Cracks (B6) Surface Water (A) Aquetic Fauns (B3) Surface Soil Cracks (B6) Surface Water (A) Moyares Soil Kords (G3) Dry Season Water Table (A2) Surface Water (A) Moyares Soil Kords (G4) Sorarset (A) Surface Water (A) Moyares Soil Cracks (G6) Surface Water (A) Surface Water (A) Moyares Soil Cracks (G6) Surface Water (A) Moyares Water Soil Cracks (G6) Surface Water (A) Moyares Mater Soil (C6) Surface Soil Cracks (G6) Surface Soil Cracks (G6) Surface Water (A) Moyares Mater Soil (C6) Surface Soil Cracks (G6) Surface Soil Cracks (G6) Profe Description (A)	d? <u>NO</u>
SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc. Hydricophytic Vegetation Present? YES Is This Sample Area Within a Wetla Wetland Hydrology Present? YES Remarks: One or more parameters lacking. Area is not a wetland. Data point is located at the upper edge of a shallow depression. HYDROLOGY Secondary Indicators: Primary Indicators (Innimum of one is required; check all that apply) Secondary Indicators (minimum of safaree Soil Cracks (86) Surface Water (A1) Aquatic Fauns (814) Dariange Praterns (810) Saturation (A3) Hydrogon Sulface Odd (C3) Ony-Season Water Table (A2) Wettand Hydrology Indicators: Presence of Reduced Ion (C4) Craftsh Burrows (C3) Burface Water (A1) Ondized Rhizospheres on Living Roots (C3) Ory-Season Water Table (A2) Water Marks (B1) Ondized Rhizospheres on Living Roots (C3) Ory-Season Water Table (A2) Bard Mar Cruss (B4) Thin Muck Strafec (C7) Saturation Visible on Aerial (B7) Innu dator Nuible on Aerial (B7) Depth (Inches): Saturation Present? Water-Stained Leaves (B9) FAC-Neutral Test (D5) Situration Present? Field Observations: NO Depth (Inches): Situ	d? <u>NO</u>
SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc. Hydrophytic Vegetation Present? NO Remarks: One or more parameters lacking. Area is not a wetland. Data point is located at the upper edge of a shallow depression. HYDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) Secondary Indicators (minimum of one is required; check all that apply) Surface Water (A1) Aquatic Fauna (B13) Sparsely Vegetated Com Saturation (A3) Hydrogen Sulfide Odor (C1) Moss Trin Lines (B14) Saturation (A3) Hydrogen Sulfide Odor (C1) Moss Trin Lines (B14) Saturation (A3) Hydrogen Sulfide Odor (C1) Moss Trin Lines (B15) Saturation (A3) Hydrogen Sulfide Odor (C1) Moss Trin Lines (B16) Saturation (A3) Ordered Rhiscopheres on Lines Roto (C3) Ory-Season Water Table Saturation (A3) Hydrogen Sulfide Odor (C1) Moss Trin Lines (B16) Saturation Sulfslo on Aerial (87) Cherketurion In Tiled Sulfs (C6) Saturation Sulfslo on Aerial (87) Water Stained Leaves (B9) FAC-Neutral Test (OS) Feld Observations: Vestained Hydrology Present? Surface Water Present? NO Depth (inches): -12 Wetland	d? <u>NO</u>
Hydrophytic Vegetation Present? VES Is This Sample Area Within a Wetla Wetland Hydrology Present? NO Ves Is This Sample Area Within a Wetla Remarks: One or more parameters lacking. Area is not a wetland. Data point is located at the upper edge of a shallow depression. Is This Sample Area Within a Wetla HYDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) Surface Sol Cracks (B6) Surface Water (A1) Aquatic Fauna (B13) Sparsely Vegeted Com High Water Table (A2) True Aquatic Fauna (B13) Sparsely Vegeted Com Water Marks (B1) Oudrage Builde Odor (C1) Mors Frainage Patterns (B10) Mors Frainage Patterns (B10) Ontri Deposits (B3) Presence of Reduced Iron (C4) Crayfish Burrow (C3) Dyreseson Water Table Orth Deposits (B3) Recent tons Reduction In Tilled Solis (C6) Saturation Alible on Acti (B7) Stunted or Stressed Plan Tion Deposits (B3) Other (Explain In Remarks) Geomorphic Position (D1) Moreotopographic Relief Elid Observations: NO Depth (Inches): >12 Wetland Hydrology Present? Surface Water Present? NO Depth (Inches): >12 Wetland Hydrology Present? <t< td=""><td>d? <u>NO</u></td></t<>	d? <u>NO</u>
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10+ bedrock 10+ bedrock 1 ³ Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ² Location: PL=Pore Lining, M=Matrix. Hydric Soil Indicators: Indicators for Problematic Hydric : Histosol (A1) Dark Surface (S7) Histoc Epipedon (A2) Polyvalue Below Surface (S8) Black Histic (A3) Dark Surface (S9)	
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Histic Epipedon (A2) Polyvalue Below Surface (S8) Coast Prairie Redox (A16	
Black Histic (A3) This Dark Surface (S9) Piedmont Elondolain Soi	
	(F19)
Hydrogen Sulfide (A4) Loamy Gleved Matrix (F2) Very Shallow Dark Surfa	(TF12)
Stratified Layers (A5) Depleted Matrix (F3) Other (Explain in Remark)
2cm Muck (A10) Redox Dark Surface (F6)	
Depleted Below Dark Surface (A11) Depleted Dark Surface (F7)	
Thick Dark Surface (A12) Redox Depressions (F8) ³ Indicators of hydrophyt	vegetation and
Sandy Mucky Mineral (S1) Iron-Manganese Masses (F12) wetland hydrology must	e present, unless
Sandy Gleyed Matrix (S4) Umbric Surface (F13) disturbed or problemativ	
Sandy Redox (S5) Piedmont Floodplain Soils (F19)	
Stripped Matrix (S6) Red Parent Material (F21)	
Portrictive Laver (if abcorved):	
Restrictive Layer (II Observed):	
nype. nyoric soli Prese	+2 NO
DEDUI UULUESI.	t?0
Remarks: No hydric soil indicators present and soil does not meet NTCHS definition of hydric soil: parameter is not met	t?
Remarks: No hydric soil indicators present and soil does not meet NTCHS definition of hydric soil; parameter is not met	t?NO



			Absolute	Dom.	Indicator					
Tree Stratum	n (Plot size:	30' radius)	% Cover	Sp?	Status*	Dominance Te	st Worksh	eet:		
1.		,		<u> </u>		# Dominants OBL, FACW, FAC:		1	(A)	
2				·			, -	, -		``
3						# Dominants a	eross all st	trata:	2	(B)
4				·		# Dominants o		inata.		(0)
				·		% Dominants			50%	(A/B)
5						70 Dominants	ODL, I ACM	, TAC.	5078	(A, D)
0. 				·		Brovalanco Ind	lov Morks	hoot:		
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5.						or more in height and less than 3in (7.6cm) DBH.				
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7.										
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Attachment 3

2018 Representative Photographs

2018 VHB Wetland Delineation - Representative Photographs Mammoth Cave National Park; Edmonson County, KY Page 1 of 6



Photograph 1: View of Data Point DP-1 showing maintained lawn.



Photograph 2: View of Data Point DP-2 showing maintained lawn.



2018 VHB Wetland Delineation - Representative Photographs Mammoth Cave National Park; Edmonson County, KY Page 2 of 6



Photograph 3: View of Data Point DP-3 showing maintained lawn.



Photograph 4: View of Data Point DP-4 showing maintained lawn.



2018 VHB Wetland Delineation - Representative Photographs Mammoth Cave National Park; Edmonson County, KY Page 3 of 6



Photograph 5: View of Data Point DP-5 showing maintained lawn.



Photograph 6: View of Data Point DP-6 showing upland forest community.



2018 VHB Wetland Delineation - Representative Photographs Mammoth Cave National Park; Edmonson County, KY Page 4 of 6



Photograph 7: View of Data Point DP-7 showing maintained lawn.



Photograph 8: View of Data Point DP-8 with a drainage feature in maintained lawn.



2018 VHB Wetland Delineation - Representative Photographs Mammoth Cave National Park; Edmonson County, KY Page 5 of 6



Photograph 9: View of Data Point DP-9 in unmaintained early successional community.



Photograph 10: View of Data Point DP-10 in herbaceous wetland adjacent to lawn.



2018 VHB Wetland Delineation - Representative Photographs Mammoth Cave National Park; Edmonson County, KY Page 6 of 6



Photograph 11: View of Data Point DP-11 in early successional community.



Photograph 12: View of Data Point DP-12 in early successional community.



Attachment 4

USFWS IPaC Species List

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as trust resources) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section. CONSUL

Location

Edmonson County, Kentucky xon Cave Pkwy oth Cave Dome Sink

Local office

Kentucky Ecological Services Field Office

\$ (502) 695-0468 (502) 695-1024

J C Watts Federal Building, Room 265 330 West Broadway Frankfort, KY 40601-8670

http://www.fws.gov/frankfort/

NOTFORCONSULTATION

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population, even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and projectspecific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

- 1. Draw the project location and click CONTINUE.
- 2. Click DEFINE PROJECT.
- 3. Log in (if directed to do so).
- 4. Provide a name and description for your project.
- 5. Click REQUEST SPECIES LIST.

Listed species

¹ and their critical habitats are managed by the <u>Ecological Services Program</u> of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries²).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact <u>NOAA Fisheries</u> for <u>species under their jurisdiction</u>.

- 1. Species listed under the <u>Endangered Species Act</u> are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the <u>listing status page</u> for more information.
- 2. <u>NOAA Fisheries</u>, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS
Gray Bat Myotis grisescens No critical habitat has been designated for this species. <u>https://ecos.fws.gov/ecp/species/6329</u>	Endangered
 Indiana Bat Myotis sodalis This species only needs to be considered if any of the following conditions apply: All activities in this location should consider possible effects to this species. The project area includes sensitive areas in close proximity to a hibernaculum. All activities in this location should consider possible effects to this species. The project area includes known "swarming 1" habitat. All activities in this location should consider possible effects to this species. The project area includes known "swarming 1" habitat. All activities in this location should consider possible effects to this species. The project area includes known "summer 1" habitat. All activities in this location should consider possible effects to this species. The project area includes known "summer 1" habitat. All activities in this location should consider possible effects to this species. The project area includes known "summer 2" habitat. All activities in this location should consider possible effects to this species. The project area includes known "summer 2" habitat. All activities in this location should consider possible effects to this species. The project area includes known "summer 2" habitat. There is final critical habitat for this species. Your location overlaps the critical habitat. 	Endangered
 https://ecos.fws.gov/ecp/species/5949 Northern Long-eared Bat Myotis septentrionalis This species only needs to be considered if the following condition applies: Contact the KFO to discuss possible impacts to the species. The specified area includes or is in the vicinity of a known hibernaculum and/or maternity roost tree. No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9045 	Threatened
Clams	STATUS
Clubshell Pleurobema clava No critical habitat has been designated for this species. <u>https://ecos.fws.gov/ecp/species/3789</u>	Endangered

Fanshell Cyprogenia stegaria No critical habitat has been designated for this species. <u>https://ecos.fws.gov/ecp/species/4822</u> Endangered

Northern Riffleshell Epioblasma torulosa rangiana No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/527	Endangered
Orangefoot Pimpleback (pearlymussel) Plethobasus cooperianus No critical habitat has been designated for this species. <u>https://ecos.fws.gov/ecp/species/1132</u>	Endangered
Pink Mucket (pearlymussel) Lampsilis abrupta No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/7829	Endangered
Purple Cat's Paw (=purple Cat's Paw Pearlymussel) Epioblasma obliquata obliquata No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/5602	Endangered
Rabbitsfoot Quadrula cylindrica cylindrica There is final critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/5165	Threatened
Ring Pink (mussel) Obovaria retusa No critical habitat has been designated for this species. <u>https://ecos.fws.gov/ecp/species/4128</u>	Endangered
Rough Pigtoe Pleurobema plenum No critical habitat has been designated for this species. <u>https://ecos.fws.gov/ecp/species/6894</u>	Endangered
Sheepnose Mussel Plethobasus cyphyus No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/6903	Endangered
Snuffbox Mussel Epioblasma triquetra No critical habitat has been designated for this species. <u>https://ecos.fws.gov/ecp/species/4135</u>	Endangered
Spectaclecase (mussel) Cumberlandia monodonta No critical habitat has been designated for this species. <u>https://ecos.fws.gov/ecp/species/7867</u>	Endangered

Crustaceans

NAME	STATUS
Kentucky Cave Shrimp Palaemonias ganteri There is final critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/5008	Endangered

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

This location overlaps the critical habitat for the following species:

NAME	ТҮРЕ
Indiana Bat Myotis sodalis https://ecos.fws.gov/ecp/species/5949#crithab	Final
Migratory hirds	,GUL'

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act

¹ and the Bald and Golden Eagle Protection Act².

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.

2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/ birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/ conservation-measures.php
- Nationwide conservation measures for birds

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general

public have sighted birds in and around your project area, visit the <u>E-bird data mapping tool</u> (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found <u>below</u>.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME

BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)

Bald Eagle Haliaeetus leucocephalus This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Sep 1 to Jul 31
Blue-winged Warbler Vermivora pinus This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	Breeds May 1 to Jun 30
Cerulean Warbler Dendroica cerulea This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. <u>https://ecos.fws.gov/ecp/species/2974</u>	Breeds Apr 23 to Jul 20
Eastern Whip-poor-will Antrostomus vociferus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 1 to Aug 20
Kentucky Warbler Oporornis formosus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Apr 20 to Aug 20

Prairie Warbler Dendroica discolor This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 1 to Jul 31
Red-headed Woodpecker Melanerpes erythrocephalus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 10 to Sep 10
Wood Thrush Hylocichla mustelina This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 10 to Aug 31

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

<u>Nationwide Conservation Measures</u> describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. <u>Additional measures</u> and/or <u>permits</u> may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS <u>Birds of Conservation Concern (BCC)</u> and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the <u>Avian Knowledge Network</u> (<u>AKN</u>). The AKN data is based on a growing collection of <u>survey</u>, <u>banding</u>, <u>and citizen science datasets</u> and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (<u>Eagle Act</u> requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the <u>E-bird Explore Data Tool</u>.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the <u>Avian</u> <u>Knowledge Network (AKN)</u>. This data is derived from a growing collection of <u>survey</u>, <u>banding</u>, <u>and citizen science</u> <u>datasets</u>.

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or yearround), you may refer to the following resources: <u>The Cornell Lab of Ornithology All About Birds Bird Guide</u>, or (if you are unsuccessful in locating the bird of interest there), the <u>Cornell Lab of Ornithology Neotropical Birds guide</u>. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

- 1. "BCC Rangewide" birds are <u>Birds of Conservation Concern</u> (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
- 2. "BCC BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
- "Non-BCC Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the <u>Eagle Act</u> requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the <u>Northeast Ocean Data Portal</u>. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the <u>NOAA NCCOS</u> <u>Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf</u> project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the <u>Diving Bird Study</u> and the <u>nanotag studies</u> or contact <u>Caleb Spiegel</u> or <u>Pam Loring</u>.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to <u>obtain a permit</u> to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to

confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns. ULTATIO

THERE ARE NO REFUGE LANDS AT THIS LOCATION.

Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION

Wetlands in the National Wetlands Inventory

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

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

THERE ARE NO KNOWN WETLANDS AT THIS LOCATION.

Data limitations

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

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

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

Data exclusions

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

Data precautions

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

APPENDIX B: RELEVANT CORRESPONDENCE

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NATIONAL PARK SERVICE Mammoth Cave National Park P.O. Box 7 Mammoth Cave, KY 42259 (270) 758-2180



May 17, 2019

Governor Scott Miller Absentee-Shawnee Tribe of Indians of Oklahoma 2025 South Gordon Cooper Drive Shawnee, OK 74801

RE: Proposed Project to Construct Family Cabins and Improve Site Access at Mammoth Cave National Park

Dear Governor Miller:

In accordance with Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended (54 USC 300101, et seq.) and its implementing regulation 36 CFR 800.3(a), please accept this letter as notification of a proposed project and its initiation of consultation.

The National Park Service (NPS) proposes to construct family cabins and improve the access and parking at the lodge parking area at Mammoth Cave National Park, Kentucky (see attached Area of Potential Effects map). This proposed project would provide a lodging option that can accommodate larger families and gatherings such as family reunions and would provide parking and intuitive circulation routes to the lodge parking area that create a sense of arrival, reestablish the cultural landscape, reduce congestion, increase the number of parking spaces, and improve visitor interaction and safety. This project is needed because lodging options for larger families and groups are currently unavailable at the park and are limited within the nearby communities. Additionally, the current configuration of entrance road and lodge parking area provides no sense of arrival, is not intuitive, and the current approach to the lodge is visually dominated by the service area of the lodge. Furthermore, the site does not meet current accessibility standards and there are issues related to pedestrian connectivity to the lodge and surrounding areas.

The purpose of this letter is to inform you of the proposed project and initiate communication with your office regarding our federal obligation under Section 106 of the NHPA. The NPS is preparing an environmental assessment, in accordance with the National Environmental Policy Act (NEPA), to identify and evaluate potential impacts to park resources and to incorporate public comment. The NPS intends to use the NEPA process to comply with Section 106 of the NHPA. We would like to request any data or information you may have on cultural resources located within the APE. We look forward to continuing the NHPA Section 106 consultation process with you as we concurrently work through our NEPA process.

Sincerely,

Barclay Trimble Superintendent





NATIONAL PARK SERVICE Mammoth Cave National Park P.O. Box 7 Mammoth Cave, KY 42259 (270) 758-2180



May 17, 2019

Reid Nelson Advisory Council on Historic Preservation Office of Federal Agency Programs 401 F Street NW Suite 308 Washington, DC 20001

RE: Proposed Project to Construct Family Cabins and Improve Site Access at Mammoth Cave National Park

Dear Mr. Nelson:

In accordance with Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended (54 USC 300101, et seq.) and its implementing regulation 36 CFR 800.3(a), please accept this letter as notification of a proposed project and its initiation of consultation.

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The area of potential effect (APE) for the proposed project is defined by activities that would include constructing a total of eight family cabins in a combination of duplexes and single cabins

The purpose of this letter is to inform you of the proposed project and initiate communication with your office regarding our federal obligation under Section 106 of the NHPA. The NPS is preparing an environmental assessment, in accordance with the National Environmental Policy Act (NEPA), to identify and evaluate potential impacts to park resources and to incorporate public comment. The NPS intends to use the NEPA process to comply with Section 106 of the NHPA. We would like to request any data or information you may have on cultural resources located within the APE. We look forward to continuing the NHPA Section 106 consultation process with you as we concurrently work through our NEPA process.

Please forward written comments to Edward Jakaitis, Cultural Resource Program Manager, at the address listed above. Thank you for your assistance with this project. If you have any questions, please contact Edward Jakaitis by telephone at (270)758-2143 or by email at edward_jakaitis@nps.gov.

Sincerely,

Barclay Trimble Superintendent



NATIONAL PARK SERVICE Mammoth Cave National Park P.O. Box 7 Mammoth Cave, KY 42259 (270) 758-2180



May 17, 2019

Principal Chief Bill John Baker Cherokee Nation P.O. Box 948 Tahlequah, OK 74464

RE: Proposed Project to Construct Family Cabins and Improve Site Access at Mammoth Cave National Park

Dear Principal Chief Baker:

In accordance with Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended (54 USC 300101, et seq.) and its implementing regulation 36 CFR 800.3(a), please accept this letter as notification of a proposed project and its initiation of consultation.

The National Park Service (NPS) proposes to construct family cabins and improve the access and parking at the lodge parking area at Mammoth Cave National Park, Kentucky (see attached Area of Potential Effects map). This proposed project would provide a lodging option that can accommodate larger families and gatherings such as family reunions and would provide parking and intuitive circulation routes to the lodge parking area that create a sense of arrival, reestablish the cultural landscape, reduce congestion, increase the number of parking spaces, and improve visitor interaction and safety. This project is needed because lodging options for larger families and groups are currently unavailable at the park and are limited within the nearby communities. Additionally, the current configuration of entrance road and lodge parking area provides no sense of arrival, is not intuitive, and the current approach to the lodge is visually dominated by the service area of the lodge. Furthermore, the site does not meet current accessibility standards and there are issues related to pedestrian connectivity to the lodge and surrounding areas.

The purpose of this letter is to inform you of the proposed project and initiate communication with your office regarding our federal obligation under Section 106 of the NHPA. The NPS is preparing an environmental assessment, in accordance with the National Environmental Policy Act (NEPA), to identify and evaluate potential impacts to park resources and to incorporate public comment. The NPS intends to use the NEPA process to comply with Section 106 of the NHPA. We would like to request any data or information you may have on cultural resources located within the APE. We look forward to continuing the NHPA Section 106 consultation process with you as we concurrently work through our NEPA process.

Sincerely,

Barclay Trimble Superintendent



NATIONAL PARK SERVICE Mammoth Cave National Park P.O. Box 7 Mammoth Cave, KY 42259 (270) 758-2180



May 17, 2019

Karen Bunso Chickasaw Nation P.O. Box 1548 Ada, OK 74812

RE: Proposed Project to Construct Family Cabins and Improve Site Access at Mammoth Cave National Park

Dear Ms. Bunso:

In accordance with Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended (54 USC 300101, et seq.) and its implementing regulation 36 CFR 800.3(a), please accept this letter as notification of a proposed project and its initiation of consultation.

The National Park Service (NPS) proposes to construct family cabins and improve the access and parking at the lodge parking area at Mammoth Cave National Park, Kentucky (see attached Area of Potential Effects map). This proposed project would provide a lodging option that can accommodate larger families and gatherings such as family reunions and would provide parking and intuitive circulation routes to the lodge parking area that create a sense of arrival, reestablish the cultural landscape, reduce congestion, increase the number of parking spaces, and improve visitor interaction and safety. This project is needed because lodging options for larger families and groups are currently unavailable at the park and are limited within the nearby communities. Additionally, the current configuration of entrance road and lodge parking area provides no sense of arrival, is not intuitive, and the current approach to the lodge is visually dominated by the service area of the lodge. Furthermore, the site does not meet current accessibility standards and there are issues related to pedestrian connectivity to the lodge and surrounding areas.

The purpose of this letter is to inform you of the proposed project and initiate communication with your office regarding our federal obligation under Section 106 of the NHPA. The NPS is preparing an environmental assessment, in accordance with the National Environmental Policy Act (NEPA), to identify and evaluate potential impacts to park resources and to incorporate public comment. The NPS intends to use the NEPA process to comply with Section 106 of the NHPA. We would like to request any data or information you may have on cultural resources located within the APE. We look forward to continuing the NHPA Section 106 consultation process with you as we concurrently work through our NEPA process.

Sincerely,

Barclay Trimble Superintendent



NATIONAL PARK SERVICE Mammoth Cave National Park P.O. Box 7 Mammoth Cave, KY 42259 (270) 758-2180



May 17, 2019

Stephen Yerka Eastern Band of Cherokee Indians P.O. Box 455 Cherokee, NC 28719

RE: Proposed Project to Construct Family Cabins and Improve Site Access at Mammoth Cave National Park

Dear Mr. Yerka:

In accordance with Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended (54 USC 300101, et seq.) and its implementing regulation 36 CFR 800.3(a), please accept this letter as notification of a proposed project and its initiation of consultation.

The National Park Service (NPS) proposes to construct family cabins and improve the access and parking at the lodge parking area at Mammoth Cave National Park, Kentucky (see attached Area of Potential Effects map). This proposed project would provide a lodging option that can accommodate larger families and gatherings such as family reunions and would provide parking and intuitive circulation routes to the lodge parking area that create a sense of arrival, reestablish the cultural landscape, reduce congestion, increase the number of parking spaces, and improve visitor interaction and safety. This project is needed because lodging options for larger families and groups are currently unavailable at the park and are limited within the nearby communities. Additionally, the current configuration of entrance road and lodge parking area provides no sense of arrival, is not intuitive, and the current approach to the lodge is visually dominated by the service area of the lodge. Furthermore, the site does not meet current accessibility standards and there are issues related to pedestrian connectivity to the lodge and surrounding areas.

The purpose of this letter is to inform you of the proposed project and initiate communication with your office regarding our federal obligation under Section 106 of the NHPA. The NPS is preparing an environmental assessment, in accordance with the National Environmental Policy Act (NEPA), to identify and evaluate potential impacts to park resources and to incorporate public comment. The NPS intends to use the NEPA process to comply with Section 106 of the NHPA. We would like to request any data or information you may have on cultural resources located within the APE. We look forward to continuing the NHPA Section 106 consultation process with you as we concurrently work through our NEPA process.

Sincerely,

Barclay Trimble Superintendent



NATIONAL PARK SERVICE Mammoth Cave National Park P.O. Box 7 Mammoth Cave, KY 42259 (270) 758-2180



May 17, 2019

Chief Glenna J. Wallace Eastern Shawnee Tribe of Oklahoma 7500 E. 128 Rd. Wyandotte, OK 74370

RE: Proposed Project to Construct Family Cabins and Improve Site Access at Mammoth Cave National Park

Dear Chief Wallace:

In accordance with Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended (54 USC 300101, et seq.) and its implementing regulation 36 CFR 800.3(a), please accept this letter as notification of a proposed project and its initiation of consultation.

The National Park Service (NPS) proposes to construct family cabins and improve the access and parking at the lodge parking area at Mammoth Cave National Park, Kentucky (see attached Area of Potential Effects map). This proposed project would provide a lodging option that can accommodate larger families and gatherings such as family reunions and would provide parking and intuitive circulation routes to the lodge parking area that create a sense of arrival, reestablish the cultural landscape, reduce congestion, increase the number of parking spaces, and improve visitor interaction and safety. This project is needed because lodging options for larger families and groups are currently unavailable at the park and are limited within the nearby communities. Additionally, the current configuration of entrance road and lodge parking area provides no sense of arrival, is not intuitive, and the current approach to the lodge is visually dominated by the service area of the lodge. Furthermore, the site does not meet current accessibility standards and there are issues related to pedestrian connectivity to the lodge and surrounding areas.

The purpose of this letter is to inform you of the proposed project and initiate communication with your office regarding our federal obligation under Section 106 of the NHPA. The NPS is preparing an environmental assessment, in accordance with the National Environmental Policy Act (NEPA), to identify and evaluate potential impacts to park resources and to incorporate public comment. The NPS intends to use the NEPA process to comply with Section 106 of the NHPA. We would like to request any data or information you may have on cultural resources located within the APE. We look forward to continuing the NHPA Section 106 consultation process with you as we concurrently work through our NEPA process.

Sincerely,

Barclay Trimble Superintendent



NATIONAL PARK SERVICE Mammoth Cave National Park P.O. Box 7 Mammoth Cave, KY 42259 (270) 758-2180



May 17, 2019

Chairman Ron Sparkman Shawnee Tribe P.O. Box 189 Miami, OK 74355

RE: Proposed Project to Construct Family Cabins and Improve Site Access at Mammoth Cave National Park

Dear Chairman Sparkman:

In accordance with Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended (54 USC 300101, et seq.) and its implementing regulation 36 CFR 800.3(a), please accept this letter as notification of a proposed project and its initiation of consultation.

The National Park Service (NPS) proposes to construct family cabins and improve the access and parking at the lodge parking area at Mammoth Cave National Park, Kentucky (see attached Area of Potential Effects map). This proposed project would provide a lodging option that can accommodate larger families and gatherings such as family reunions and would provide parking and intuitive circulation routes to the lodge parking area that create a sense of arrival, reestablish the cultural landscape, reduce congestion, increase the number of parking spaces, and improve visitor interaction and safety. This project is needed because lodging options for larger families and groups are currently unavailable at the park and are limited within the nearby communities. Additionally, the current configuration of entrance road and lodge parking area provides no sense of arrival, is not intuitive, and the current approach to the lodge is visually dominated by the service area of the lodge. Furthermore, the site does not meet current accessibility standards and there are issues related to pedestrian connectivity to the lodge and surrounding areas.

The purpose of this letter is to inform you of the proposed project and initiate communication with your office regarding our federal obligation under Section 106 of the NHPA. The NPS is preparing an environmental assessment, in accordance with the National Environmental Policy Act (NEPA), to identify and evaluate potential impacts to park resources and to incorporate public comment. The NPS intends to use the NEPA process to comply with Section 106 of the NHPA. We would like to request any data or information you may have on cultural resources located within the APE. We look forward to continuing the NHPA Section 106 consultation process with you as we concurrently work through our NEPA process.

Your response within 30 days from the date of receipt of this letter would be greatly appreciated. Please forward written comments to Edward Jakaitis, Cultural Resource Program Manager, at the address listed above. Thank you for your assistance with this project. If you have any questions, please contact Edward Jakaitis by telephone at (270)758-2143 or by email at edward_jakaitis@nps.gov.

Sincerely,

Barclay Trimble Superintendent



NATIONAL PARK SERVICE Mammoth Cave National Park P.O. Box 7 Mammoth Cave, KY 42259 (270) 758-2180



May 17, 2019

Craig Potts Executive Director and SHPO Kentucky Heritage Council Barstow House 410 High Street Frankfort, KY 40601

RE: Proposed Project to Construct Family Cabins and Improve Site Access at Mammoth Cave National Park

Dear Mr. Potts:

In accordance with Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended (54 USC 300101, et seq.) and its implementing regulation 36 CFR 800.3(a), please accept this letter as notification of a proposed project and its initiation of consultation.

The National Park Service (NPS) proposes to construct family cabins and improve the access and parking at the lodge parking area at Mammoth Cave National Park, Kentucky (see attached Area of Potential Effects map). This proposed project would provide a lodging option that can accommodate larger families and gatherings such as family reunions and would provide parking and intuitive circulation routes to the lodge parking area that create a sense of arrival, reestablish the cultural landscape, reduce congestion, increase the number of parking spaces, and improve visitor interaction and safety. This project is needed because lodging options for larger families and groups are currently unavailable at the park and are limited within the nearby communities. Additionally, the current configuration of entrance road and lodge parking area provides no sense of arrival, is not intuitive, and the current approach to the lodge is visually dominated by the service area of the lodge. Furthermore, the site does not meet current accessibility standards and there are issues related to pedestrian connectivity to the lodge and surrounding areas.

The area of potential effect (APE) for the proposed project is defined by activities that would include constructing a total of eight family cabins in a combination of duplexes and single cabins

The purpose of this letter is to inform you of the proposed project and initiate communication with your office regarding our federal obligation under Section 106 of the NHPA. The NPS is preparing an environmental assessment, in accordance with the National Environmental Policy Act (NEPA), to identify and evaluate potential impacts to park resources and to incorporate public comment. The NPS intends to use the NEPA process to comply with Section 106 of the NHPA. We would like to request any data or information you may have on cultural resources located within the APE. We look forward to continuing the NHPA Section 106 consultation process with you as we concurrently work through our NEPA process.

Please forward written comments to Edward Jakaitis, Cultural Resource Program Manager, at the address listed above. Thank you for your assistance with this project. If you have any questions, please contact Edward Jakaitis by telephone at (270)758-2143 or by email at edward_jakaitis@nps.gov.

Sincerely,

Barclay Trimble Superintendent



NATIONAL PARK SERVICE Mammoth Cave National Park P.O. Box 7 Mammoth Cave, KY 42259 (270) 758-2180



May 17, 2019

Chief George Wickliffe United Keetoowah Band of Cherokee Indians P.O. Box 746 Tahlequah, OK 74465

RE: Proposed Project to Construct Family Cabins and Improve Site Access at Mammoth Cave National Park

Dear Chief Wickliffe:

In accordance with Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended (54 USC 300101, et seq.) and its implementing regulation 36 CFR 800.3(a), please accept this letter as notification of a proposed project and its initiation of consultation.

The National Park Service (NPS) proposes to construct family cabins and improve the access and parking at the lodge parking area at Mammoth Cave National Park, Kentucky (see attached Area of Potential Effects map). This proposed project would provide a lodging option that can accommodate larger families and gatherings such as family reunions and would provide parking and intuitive circulation routes to the lodge parking area that create a sense of arrival, reestablish the cultural landscape, reduce congestion, increase the number of parking spaces, and improve visitor interaction and safety. This project is needed because lodging options for larger families and groups are currently unavailable at the park and are limited within the nearby communities. Additionally, the current configuration of entrance road and lodge parking area provides no sense of arrival, is not intuitive, and the current approach to the lodge is visually dominated by the service area of the lodge. Furthermore, the site does not meet current accessibility standards and there are issues related to pedestrian connectivity to the lodge and surrounding areas.

The purpose of this letter is to inform you of the proposed project and initiate communication with your office regarding our federal obligation under Section 106 of the NHPA. The NPS is preparing an environmental assessment, in accordance with the National Environmental Policy Act (NEPA), to identify and evaluate potential impacts to park resources and to incorporate public comment. The NPS intends to use the NEPA process to comply with Section 106 of the NHPA. We would like to request any data or information you may have on cultural resources located within the APE. We look forward to continuing the NHPA Section 106 consultation process with you as we concurrently work through our NEPA process.

Sincerely,

Barclay Trimble Superintendent



Jakaitis, Edward <edward_jakaitis@nps.gov>

Mammoth Cave National Park, review of Section 106 undertaking

3 messages

Jakaitis, Edward <edward_jakaitis@nps.gov> To: syerka@nc-cherokee.com Cc: Timothy Pinion <timothy pinion@nps.gov> Tue, May 21, 2019 at 9:45 AM

Dear Mr. Yerka,

Please see the attached correspondence regarding a proposed Section 106 undertaking, to construct family cabins and improve site access at Mammoth Cave National Park. Should a request for consultation with Mammoth Cave National Park be made, please contact me at your earliest convenience.

Sincerely, Ed Jakaitis

Edward Jakaitis Cultural Resource Program Manager Mammoth Cave National Park P.O. Box 7 Mammoth Cave, KY 42259 (0)270-758-2143 (c)270-597-6349 edward_jakaitis@nps.gov



MACA_Family Cabins_Section 106 Initiation Letter_Eastern Band of Cherokee.pdf 2044K

Stephen Yerka <syerka@nc-cherokee.com> To: "Jakaitis, Edward" <edward_jakaitis@nps.gov> Cc: Timothy Pinion <timothy_pinion@nps.gov> Tue, May 21, 2019 at 6:01 PM

Thank you Mr. Jakaitis,

For inviting the EBCI THPO to be a consulting party for the proposed 106 project to construct family cabins and improve access to Mammoth Cave National Park. The EBCI THPO accepts your invitation and looks forward to engaging with you on this project.

I am in the field right now and responding from my phone. Should you need a more formal letter response, I can provide it to you when I am back in the office.

Thank you,

Stephen

Stephen Yerka Historic Preservation Specialist THPO, EBCI (828) 359-6852 [Quoted text hidden]

<MACA_Family Cabins_Section 106 Initiation Letter_Eastern Band of Cherokee.pdf>

Jakaitis, Edward <edward_jakaitis@nps.gov> To: Stephen Yerka <syerka@nc-cherokee.com> Fri, May 31, 2019 at 5:55 PM

Dear Stephen,

I wanted to touch base with you and acknowledge our receipt of your acceptance for consultation. Seeing as this is the end of the week, I would like for us to arrange a discussion some time in the next week or so and I can provide you with some general information on the project, but also learn from you what topics of interest the tribe may have with the family cabins project. I can then gather some specific information that will be most beneficial to the EBCI's interests.

I should also note, I will be participating in a field studies course here at the park, running through all of next week. I will continue to have access to my email, but will be out of phone contact for much of my days next week. But, I would be happy to speak with you to kick start our discussions, during most evenings next week between 6pm-7pm CST. Thursday, I will be available from 5pm-6pm. If this will not work, just let me know and we can speak that following Monday (6/10), any time you like.

Thanks for your interest on behalf of the Eastern Band of Cherokee and if I can offer any information sooner than next week, let me know or feel free to call my cell, listed in my signature.

Kind Regards, Ed Jakaitis

[Quoted text hidden]



GW 329 DBP CHEROKEE NATION® P.O. Box 948 • Tahleguah, OK 74465-0948 • 918-453-5000 • cherokee.org Office of the Chief

Bill John Baker Principal Chief OP Ch JSS&อปั OEOGA

S. Joe Crittenden Deputy Principal Chief ወ. KG. JEYወy WPA DLሪብ ውEQGA

June 18, 2019

Edward Jakaitis National Park Service Mammoth Cave National Park P.O. Box 7 Mammoth Cave, KY 42259

Re: Proposed Project to Construct Family Cabins and Improve Site Access at Mammoth Cave National Park

Mr. Edward Jakaitis:

The Cherokee Nation (Nation) is in receipt of your correspondence about **Proposed Project to Construct Family Cabins and Improve Site Access at Mammoth Cave National Park**, and appreciates the opportunity to provide comment upon this project. Please allow this letter to serve as the Nation's interest in acting as a consulting party to this proposed project.

The Nation maintains databases and records of cultural, historic, and pre-historic resources in this area. Our Historic Preservation Office reviewed this project, cross referenced the project's legal description against our information, and found no instances where this project intersects or adjoins such resources. Thus, the Nation does not foresee this project imparting impacts to Cherokee cultural resources at this time.

However, the Nation requests that the National Park Service (NPS) halt all project activities immediately and re-contact our Offices for further consultation if items of cultural significance are discovered during the course of this project.

Additionally, the Nation requests that the NPS conduct appropriate inquiries with other pertinent Tribal and Historic Preservation Offices regarding historic and prehistoric resources not included in the Nation's databases or records.

If you require additional information or have any questions, please contact me at your convenience. Thank you for your time and attention to this matter.

Wado,

Elizabeth Toombs, Tribal Historic Preservation Officer Cherokee Nation Tribal Historic Preservation Office elizabeth-toombs@cherokee.org 918.453.5389



Jakaitis, Edward <edward_jakaitis@nps.gov>

[EXTERNAL] Family Cabins Letter: Can You Clarify?

5 messages

Ryall, Jennifer (Heritage Council) <Jennifer.Ryall@ky.gov> To: "Jakaitis, Edward" <edward_jakaitis@nps.gov> Mon, Jun 17, 2019 at 9:36 AM

Hey Ed,

I reached the point in your letter regarding the family cabins where you state that, "The NPS intends to use the NEPA process to comply with Section 106 of the NHPA." Just to be sure we understand completely, is NPS actually proposing substitution (this might be our office's first project where true substitution is proposed) or are you proposing parallel Section 106 and NEPA consultation (the latter being more standard)? We'll be fine either way, but substitution isn't used often and we want to be sure everyone understands what we're getting into.

Thanks,

~Jenn

Jennifer Ryall

Environmental Review Coordinator

Kentucky Heritage Council

410 High Street

Frankfort, Kentucky 40601

Phone: (502) 892-3619

Jakaitis, Edward <edward_jakaitis@nps.gov> To: "Ryall, Jennifer (Heritage Council)" <Jennifer.Ryall@ky.gov> Tue, Jun 18, 2019 at 3:29 PM

Jenn,

Yes, that is correct. We do intend to consult under the NEPA process, with the identification, evaluation of significance, and finding of effect included in the EA document and review process. We would be sending this document to your office at the same time that the US Fish and Wildlife Service will be receiving their own copy. We will take all comments as they come and your office will still be afforded the thirty day review period. If you have any questions or concerns regarding this process for us, please let me know. I do not anticipate any divergence from the previous review and comment process that we have gone through with other projects, to this point.

Thank you, Ed [Quoted text hidden]

Edward Jakaitis Cultural Resource Program Manager Mammoth Cave National Park P.O. Box 7 Mammoth Cave, KY 42259 (0)270-758-2143 (c)270-597-6349

https://mail.google.com/mail/u/0?ik=93fa7d7a95&view=pt&search=all&permthid=thread-f%3A1636598746233371720&simpl=msg-f%3A16365987462... 1/4

edward_jakaitis@nps.gov



Mail Delivery System <Mailer-Daemon@smtp6.smgr.doi.gov> To: edward_jakaitis@nps.gov Tue, Jun 18, 2019 at 3:29 PM

I'm sorry to have to inform you that your message could not be delivered to one or more recipients. It's attached below.

For further assistance, please send mail to <postmaster@doi.gov>.

If you do so, please include this problem report. You can delete your own text from the attached returned message.

<Jennifer.Ryall@ky.gov>: 502 4.4.2 Error: Connection lost to forwarding agent. 451 4.4.2 Error: Connection lost to forwarding agent.

Final-Recipient: rfc822; Jennifer.Ryall@ky.gov Status: 5.4.2 Action: failed Last-Attempt-Date: Tue, 18 Jun 2019 16:29:40 -0400 Diagnostic-Code: smtp; 502 4.4.2 Error: Connection lost to forwarding agent. 451 4.4.2 Error: Connection lost to forwarding agent.

------ Forwarded message -----From: "Jakaitis, Edward" <edward_jakaitis@nps.gov> To: "Ryall, Jennifer (Heritage Council)" <Jennifer.Ryall@ky.gov> Cc: Bcc:

Date: Tue, 18 Jun 2019 15:29:27 -0500

Subject: Re: [EXTERNAL] Family Cabins Letter: Can You Clarify? Jenn.

Yes, that is correct. We do intend to consult under the NEPA process, with the identification, evaluation of significance, and finding of effect included in the EA document and review process. We would be sending this document to your office at the same time that the US Fish and Wildlife Service will be receiving their own copy. We will take all comments as they come and your office will still be afforded the thirty day review period. If you have any questions or concerns regarding this process for us, please let me know. I do not anticipate any divergence from the previous review and comment process that we have gone through with other projects, to this point. Thank you,

Ed

On Mon, Jun 17, 2019 at 9:36 AM Ryall, Jennifer (Heritage Council) <Jennifer.Ryall@ky.gov> wrote:

Hey Ed,

I reached the point in your letter regarding the family cabins where you state that, "The NPS intends to use the NEPA process to comply with Section 106 of the NHPA." Just to be sure we understand completely, is NPS actually proposing substitution (this might be our office's first project where true substitution is proposed) or are you proposing parallel Section 106 and NEPA consultation (the latter being more standard)? We'll be fine either way, but substitution isn't used often and we want to be sure everyone understands what we're getting into.

Thanks,

~Jenn

Jennifer Ryall

Environmental Review Coordinator

Kentucky Heritage Council

410 High Street

Frankfort, Kentucky 40601

Phone: (502) 892-3619

Edward Jakaitis Cultural Resource Program Manager Mammoth Cave National Park P.O. Box 7 Mammoth Cave, KY 42259 (0)270-758-2143 (c)270-597-6349 edward jakaitis@nps.gov



Re [EXTERNAL] Family Cabins Letter Can You Clarify 11K

Jakaitis, Edward <edward_jakaitis@nps.gov> To: "Ryall, Jennifer (Heritage Council)" <jennifer.ryall@ky.gov> Tue, Jun 18, 2019 at 3:30 PM

[Quoted text hidden]

Ryall, Jennifer (Heritage Council) <Jennifer.Ryall@ky.gov> To: "Jakaitis, Edward" <edward_jakaitis@nps.gov> Tue, Jun 18, 2019 at 3:34 PM

Sounds good! This will just be a bit of a new one for us so I wanted to make sure we're on the same page. It sounds like we are and that you're handling substitution as it's laid out in the Regs (informing us in advance, giving us the chance to comment, having the consultation reflected in the EA). I always look forward to working through a different type of consultation process.

~Jenn

Jennifer Ryall

Environmental Review Coordinator

Kentucky Heritage Council

410 High Street

Frankfort, Kentucky 40601

Phone: (502) 892-3619

[Quoted text hidden]



As the nation's principal conservation agency, the Department of the Interior has responsibilities for most of our nationally owned public lands and natural resources. This includes fostering wise use of our land and water resources, protecting our fish and wildlife, preserving the environmental and cultural values of our national parks and historic places, and providing for the enjoyment of life through outdoor recreation. The department assesses our energy and mineral resources and works to ensure that their development is in the best interests of all our people. The department also promotes the goals of the Take Pride in America campaign by encouraging stewardship and citizen responsibility for American Indian reservation communities and for people who live in island territories under US administration.

NPS/MACA/AUGUST 2019