



**Clean Water Act Section 401 Water Quality Certification Application**

Please refer to the "Clean Water Act Section 401 Water Quality Certification Application Guidance" document for assistance with completing this application.

**A. Pre-Filing Meeting**

Please provide the date that a pre-filing meeting was requested from Nevada Division of Environmental Protection (NDEP) Bureau of Water Quality Planning (BWQP).

October 22, 2024

*Note: If a pre-filing meeting has not been requested, please schedule a pre-filing meeting with NDEP BWQP.*

**B. Contact Information**

**Project Proponent Information**

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**C. Project General Information**

**Project Location**

Project/Site Name: Upper Carson Slough Backcountry Trail Project

Name of receiving waterbody: Upper Carson Slough watershed

Address: -

Type of waterbody present at project location (*select all that apply*):

City: Amargosa Valley

- Perennial River or Stream
- Intermittent River or Stream
- Ephemeral River or Stream
- Lake/Pond/Reservoir
- Wetland
- Other: \_\_\_\_\_

County: Nye

State: Nevada

Zip Code: 89020

Latitude (UTM or Dec/Deg): 36.4676523°N

Longitude (UTM or Dec/Deg): 116.3402596°W

Township: 17S

Range: 50E

Section: 9, 10, 15, 16, 21, 22, 28

¼ Section:

## Project Details

### Project purpose:

The primary goal of the Project is to create a backcountry hiking and nature exploration opportunity for Ash Meadows National Wildlife Refuge (AMNWR) visitors, which will be different and unique compared to existing trails which are front country visitor access points, short easy access trails, often with boardwalks, a visitor center and more developed associated features. The new trail system will provide a clear pathway with both point to point and loop options, and with the intent of minimizing user made routes and trampling of vegetation.

The backcountry trail system will support the mission of AMNWR by enhancing the understanding of the ongoing restoration efforts and fostering a greater connection between refuge visitors and the Upper Carson Slough (UCS) by highlighting the cultural and ecological importance of the area. New interpretive displays designed with the help of Newe and Nuwu/Nuwuvi Working Group (NWG) will provide visitors with educational opportunities to learn about the cultural significance that these ancestral lands have for the indigenous people of the area.

### Describe current site conditions:

Attachments can include, but are not limited to, relevant site data, photographs that represent current site conditions, or other relevant documentation.

The trail is sited entirely within the AMNWR. Much of the trail alignment is found within the effective 100-year floodplain with gentle gradient moving between pockets of the desert upland and wetland habitats of the UCS. The USFWS mapped out ponding water areas during a winter site visit by their botanical staff, and subsequent iterations of the trail between 2012 and 2024 have attempted to avoid the areas of seasonal ponding or overly wet conditions as well as sensitive plant habitat.

A webmap is provided of the proposed trail alignment and features, and also includes photo points from multiple site visits performed to inform the project design. The webmap is available here: [Upper Carson Trail Comparison](#)

### Describe the proposed activity including methodology of each project element:

#### Project Overview:

The project consists of the construction of approximately 8.17 miles of trail routes, separated into four sections, and associated recreational support infrastructure including parking areas, trailhead kiosks, a vault toilet, overlooks, waypoint signs, and informational panels. The four trail segments are as follows:

- Peterson Reservoir Trail: 0.84 mile
- UCS Loop Trail: 3.58 miles
- Cold Spring Trail: 2.14 miles
- Rogers/Longstreet Spring Connection Trail: 1.61 miles

The trails will be sited within existing disturbance areas (e.g., roads, berms, two track) to the extent practicable, yet will also require construction in undisturbed areas to provide trail connectivity. Approximately 4.58 miles of the trail occur in previously disturbed areas (i.e., creating no new disturbance) and the remaining 3.59 miles will be new disturbance. Only the length of trail that will be new disturbance is considered for potential impacts to wetlands. Trail disturbance in previously disturbed areas is not considered new wetland

impact (as confirmed by USACE staff at the pre-application meeting) and has therefore not been included in the wetland impact calculations.

Design criteria have been refined throughout the design process, based on review and input from the USFWS staff, NWG, and the A-E team. Initial design criteria were derived from the focused discussion at the project kick-off meeting; the June 2023 trail corridor marking (50-foot width) with USFWS staff, and from technical guidance and engineering standards. Technical guidance and engineering standards that outline the best practices and methods for trail design and construction on federally managed public lands are adhered to in the design. Sources include: *Outdoor Developed Areas accessibility guidance (US Access Board, 2014)*, *Federal Highway Administration (FHWA) Highway Design (FHWA, 2018)*, discussions with construction contractors and material vendors and was designed to comply with the standards and requirements of the Architectural Barriers Act (ABA) to the maximum extent practicable.

Design criteria identified at the beginning of the project with stakeholders include:

- Include the Tribal Working Group to the extent they want to participate
- Low impact
- User experience is uniquely backcountry
- ABA compliant
- Budget and schedule limitations
- Minimize mid- to long-term maintenance
- Responsible land use and respect

**Trail Construction:**

Construction of the trails will require vegetation removal, hand grading and compaction of native soils to create a 36-inch trail tread width, removal of materials to create a smooth trail surface, and applying trail edging (tufa rock or similar) to the first 100 feet of trail for directional purposes near trailhead access points. Construction of the trails will be completed using hand tools for the grading, smoothing, and vegetation clearing. Heavy equipment will not be used. Where feasible and practical, vegetation removed from the trail surface will be replanted on the trail edge for soil stabilization and to encourage visitors to stay on the designated path. Architectural Barriers Act (ABA) guidance and the Final 35% Design require a maximum of 2% cross slope and no more than 5% running slope.

The design footprint includes a 50-foot buffer (total width) to customize and adjust (field fit) the trail footprint during construction to minimize impacts to wetlands and sensitive plants, minimize soil disturbance, and provide flexibility based on site conditions.

**Crossings and Boardwalk:**

Small portions of the trails will include 4-foot-wide puncheon boardwalk or low profile bridges which will be constructed over channel crossings and marshy areas where necessary. These include one 7-foot crossing and one 20-foot crossing on the Cold Spring Trail, one 20-foot crossing on the Peterson trail that does not impact wetland, and one 30-foot boardwalk (that encompasses a 4-foot crossing) on the UCS Loop Trail. The crossings and boardwalk may have variable decking/surface depending on procurement with design/build contractor with the intent to integrate with the natural setting, while being low

maintenance and weather resistant. The supports are currently proposed to be 4 by 10 Fiber Reinforced Polymer (FRP) footers/mudsill set on the ground surface, with cross bar supports placed at the surface at intervals, if needed depending on structural integrity of decking. The FRP material has been recommended due to its lightweight and durable characteristics for hand transporting to the crossing locations, as well as longevity of use before replacement is needed. The FRP material can also span larger distances than Trex, treated wood, or other support materials. Whether cross support beams are needed intermediately will need to be determined during final design and depends on structural integrity of decking (structural mesh can result in much fewer cross beams, lets light and water into the wetland, whereas Trex would require increased cross beams per supplier specifications). For the purposes of quantifying potential impacts at the crossings, a conservative approach has been used that assumes full impact of wetlands below the bridges and boardwalks, however the actual impact will only be at the location of mudsill/footing and any intermediate cross bar supports placed on the surface (if any). The design has been selected to maintain current wetland function for flood amelioration, percolation, retention, and wetland habitat. Vegetation will naturally recruit under the bridge.

All crossings and boardwalk that will create a new wetland disturbance are embedded in the corresponding row of the wetland impact table.

**Passing Areas Along the Trail:**

Passing spaces along the trail will be constructed in upland and/or previously disturbed areas, thus creating no new wetland impacts. Passing spaces of at least 60"x60" in area will be constructed at least every 1,000 feet per ABA recommendations, along the trail alignment using similar methods as described above (clearing, smoothing, etc.). The distance between passing spaces may adjust to avoid the placement lying within new wetland disturbance trail sections (e.g., none of the passing spaces are included in the wetland impact table because they will all lie in previously disturbed or upland areas).

**Signage:**

All trailhead information, wayfinding, overlook, and regulatory signs will be installed in upland or previously disturbed areas and will not create new wetland impacts. Trailhead signs will be placed in the parking areas or at the trailhead points. Mile marker signs will be installed every 0.5-mile along trails and waypoint and regulatory signs will be placed at trail junctions and other areas where guidance is necessary. The signs will be installed in steel frames and mounting systems with gravel or concrete footings.

**Parking Areas and Associated Infrastructure:**

The parking lots, kiosks, and vault toilet will be sited within upland or previously disturbed areas and will not create new wetland impacts. The parking areas will consist of improvements to two existing parking lots and two newly built areas. The surface will be composed of aggregate base and surface material and will be approximately 11-inches-thick. The parking areas will be edged with decorative tufa rock and will be graded for appropriate drainage. A trailhead kiosk will be installed at each parking area.

**Overlook Areas and Associated Infrastructure:**

The overlook areas will be sited within upland or previously disturbed areas and will not create new wetland impact. The overlook areas will consist of three newly built areas. Three of the overlook areas will be cleared and graded to create at least a 36" x 48" area and one overlook area will be a boardwalk. Railings or tufa rock edgings will be placed around the main footprint of the overlooks. Interpretive displays will be installed within the overlook areas. The areas will be graded to ensure appropriate drainage.

A complete description of these project features and 35% design drawings are provided in **Attachment A – UCS Backcountry Trail Final 35% Design Report**.

**New Wetland Impacts Calculations:**

For a conservative estimate of cut and fill, activities have been estimated at 1 cubic yard (CY) per linear foot of trail (3-foot trail width \* 1-foot trail length \* 4-inch depth = 1 cubic yard/linear foot). The 4-inch depth was selected to be a clear overestimate to over-compensate for minor and unforeseen cut and fill during trail construction. The trail design, and subsequent tools and methods selected for trail construction reflect the low-impact goals of the project and do not require cut and fill. Immediately adjacent materials will be used to achieve trail smoothing. Any cut or fill (using immediately adjacent materials) would be to achieve a maximum 2% cross grade and maximum 5% running grade. There have been no areas identified within the proposed impacted wetland areas that clearly exceed these slope requirements, and transition areas from wetland to upland are the most likely area to require a change in running grade. Any other locations where a change in grade would be necessary include upland or already disturbed areas, such as where trail transitions to berm or existing roads occur, or to the upland parking and outlook areas.

**Operation and Maintenance:**

The addition of small amounts of crushed rock or other materials may be placed in persistently inaccessible areas and would be placed in such a way as to not impact flow of surface water or impact hydrology function, as discussed in the ESA Section 7 Biological Opinion. The rock would be installed at a maximum depth of 4 inches and has been accounted for in the 1 CY per LF estimated wetland impact discussed above heading. Trail maintenance may also include selective mowing if vegetation growth substantially impedes hiking access.

Estimate the nature, specific location, and number of discharge(s) expected to be authorized by the proposed activity:

The trail will cross one large, mapped wetland area at multiple locations, as well as three slough channel crossings (one of which is surrounded by uplands) and one approximately 30-foot-long boardwalk area across low lying area that ponds for intermittent times. The location and number of discharge areas to wetlands are provided in the USACE permit application (ORM sheet).

Provide the date(s) on which the proposed activity is planned to begin and end and the approximate date(s) when any discharge(s) may commence:

Project construction is expected to begin as soon as all permits are approved and last 6-12 months. If the trail is not completed within this timeline, multiple phases of construction may be planned under these permits to complete the project. The FONSI and BO include best management practices such as requiring migratory bird nest surveys if work must be completed during the local migratory bird nesting season.

Provide a list of the federal permit(s) or license(s) required to conduct the activity which may result in a discharge into regulated waters (see mandatory attachments):

- U.S. Army Corps of Engineers Nationwide Permit 14 (CWA 404)
- The following permits will be obtained if required:
  - NDEP Construction Stormwater General Permit
  - NDEP Temporary Working in Waterways Permit

Provide a list of all other federal, state, interstate, tribal, territorial, or local agency authorizations required for the proposed activity and the current status of each authorization:

**Jurisdictional Delineation:** A jurisdictional delineation was completed for the UCS by Otis Bay Ecological Consultants in 2011, using 1987 delineation manual and three-parameter approach methodology. The delineated Waters of the U.S. are included in the Wetland Delineation Report presented in Attachment B. For the purposes of permitting and based on pre-permit discussions with USACE and NDEP, the 2011 delineation will be relied on as a conservative approach for baseline wetlands at the site and estimating potential wetland impacts. The site is a highly dynamic wetland complex/system and varies depending on rainfall and weather within each year and is predominantly spring fed; it is assumed that major modifications have not occurred to the wetland hydrology other than slough channel and spring restoration/improvements, and the 2011 delineation presents a conservative boundary of likely wetland areas (consisting of perennial, intermittent, and ephemeral complex system). For the purposes of permitting with NDEP, it is assumed that the Waters of the State (WOS) are synonymous with the mapped Waters of the United States (WOTUS). NDEP stated in the pre-filing meeting that they would not determine limits of WOS and would rely on USACE conservative approach for limits of wetlands for the project. Cowardin wetland classifications are provided based on the NWI data.

**U.S. Fish and Wildlife (USFWS) NEPA:** An environmental assessment (EA) was completed in August 2013 (Attachment C) and a Finding of No Significant Impact (FONSI) was issued in September 2013 (Attachment D).

**USFWS Endangered Species Act Section 7 Consultation:** In 2012, USFWS prepared a Biological Opinion (BO) for Section 7 Consultation in which the UCS restoration projects were analyzed which included the Longstreet Spring, Rogers Spring, Cold Spring, and Five Springs restoration projects, berm/dam removal projects, and the UCS backcountry trail project. The consultation found that potential adverse effects may occur to Ash Meadows Amargosa pupfish (*Cyprinodon nevadensis mionectes*), and Ash Meadows speckled dace (*Rhinichthys osculus nevadensis*) from the spring restoration and dam removal projects. The UCS backcountry trail project was not listed as a potential impact to those species. The consultation also found the UCS projects have a potential to impact Ash Meadows sunray (*Enceliopsis nudicaulis var. corrugata*) and spring-loving centaury (*Centaureum namophilum*) from direct and indirect effects of construction near populations of the plants. Impacts will be reduced through mitigations (transplanting and seed collection) for Ash Meadows sunray and spring-loving centaury is expected to benefit from the restoration projects due to restoring hydrologic function within its habitats around the NWR. The consultation did not state whether the trail alignment would directly affect populations of those plant species. The 50-foot trail corridor within which the trail will be field fit, will allow trail alignment to avoid and minimize impacts to these species which can vary from year to year. If impacts cannot be avoided, then the mitigation measure of transplanting or seed collection will be implemented. The BO is included in Attachment E.

	<p>In 2024, the trail design was updated to site more of the alignment within existing disturbance areas (e.g., roads and berms) to reduce disturbance to sensitive cultural and natural resources. No new impacts that weren't already disclosed in the 2012 consultation would occur. USFWS will provide a biological monitor during project construction to ensure that sensitive plant populations are avoided, or seed collection or plant salvage would occur where feasible and beneficial.</p> <p><b>National Historic Preservation Act Section 106 Consultation:</b>          The Nevada State Historic Preservation Office (SHPO) was initially engaged for a Section 106 Consultation for the AMNWR restoration and trail projects in 2012. Due to updates in the trail alignment, the consultation was reinitiated in August 2024. SHPO did not respond within the 30-day window and USFWS then determined that the project would have "No Adverse Effects" under the regulations stated in 36 CFR 800.5(b), 36 CFR 800.3(c)(4), and 36 CFR 800.4(d)(1)(i) (Attachment F).</p> <p><b>Tribal Consultation:</b> Tribal consultation meetings were held with members of the Newe (Timbisha Shoshone) and Nuwu/Nuwuvi (Southern Paiute/Chemehuevi) regarding the project. These meetings were held on 21-23 March 2023, 8-9 May 2023, 21-22 August 2023, 28-30 January 2024, and 16 April 2024. Tribal members provided diverse input on the goals of the project and specific trail design elements and shared their approval of the trail design. Many members voiced support for this low-profile backcountry trail versus a more developed front-country trail such as what is present in areas such as the visitor center and Point-of-rocks boardwalks. This consultation is described in the Section 106 Consultation document presented in Attachment F.</p>	
Total area of impact to regulated waterbodies (acres):	0.246 acres	
Total distance of impact to regulated waterbodies (linear feet):	3,539.6 linear feet	
Amount excavation and/or fill discharged within regulated waters (acres, linear feet, and cubic yards):	Temporary: 0 acres, 0 linear feet, 0 cubic yards	Permanent: 0.246 acres, 3,539.6 linear feet, 136.5 cubic yards
Amount of dredge material discharged within regulated waters (acres, linear feet, and cubic yards):	Temporary: 0 acres, 0 linear feet, 0 cubic yards	Permanent: 0 acres, 0 linear feet, 0 cubic yards
Describe the reason(s) why avoidance of temporary fill in regulated waters is not practicable (if applicable):	N/A - temporary fill is not required for project design or construction.	

Describe the Best Management Practices (BMPs) to be implemented to avoid and/or minimize impacts to regulated waters:


Examples include sediment and erosion control measures, habitat preservation, flow diversions, dewatering, hazardous materials management, water quality monitoring, equipment or plans to treat, control, or manage discharges, etc.

- The trail alignment has been sited to avoid wetlands, areas of saturated soils, and surface waters to the extent practicable.
- The trail surfaces (compacted native soil and boardwalk) were chosen to limit alteration of existing surface hydrology and topography.
- Trail construction will not occur during precipitation events when soils may be more susceptible to erosion, disturbance, and compaction.
- Trail construction will be performed with hand tools to minimize surface area disturbance.
- Vegetation removed from the trail surface may be replanted on the trail edge to stabilize soils and encourage users to stay on the trail.
- The trails will be closed during and after severe weather events to reduce the risk of erosion and sedimentation and allow time to repair the trails, as necessary.
- Durable trail infrastructure materials will be selected in order to reduce maintenance requirements. The trails will be maintained, which will include measures such as trail repair and erosion control, as necessary.
- All constructed slopes and fills (e.g., gravel parking areas) will be designed to ensure appropriate drainage.
- Trail slopes may be constructed in exceedances of Architectural Barriers Act (ABA) requirements in areas where extensive cut and fill may cause excessive sedimentation and erosion (see ABA Exemptions table in Design Document). This would be only in minor areas, if any, such as transition to outlooks and parking areas. However, the nature of a design-build contract for the next steps allows contractor to micro-site and develop the best slopes and location for the trail bed to promote longevity and sustainable design that requires limited long-term maintenance.
- Trail signage will provide information on trail rules (e.g., visitors must stay on trail) and safety which will reduce anthropogenic impacts to waters and species.
- During project planning field work performed in collaboration with USFWS, a 50-foot-wide corridor was established and screened to find areas where the trail could be constructed with minimal impacts to natural and cultural resources. The 36-inch-wide final trail alignment will be field-fit (micro-sited) within this corridor during construction.
- All mitigation requirements as described in the FONSI (Attachment D) will be adhered to. These measures are more applicable to the associated spring and slough restoration projects which were also analyzed within the EA, but the measures that are applicable for the trail construction will be utilized and will indirectly minimize impacts to waters (e.g., USFWS will provide biological monitors, designated access areas will be delineated with flagging, equipment used in both the upland and wetlands areas will be washed to prevent the spread of noxious and invasive weeds, etc.).
- The trail will be constructed using current agency technical guidance and engineering standards, such as the U.S. Forest Service's 2023 *Standard Trail Plans and Specification* document and the U.S. Access Board's 2014 *Outdoor Developed Areas* guidance.



Describe how the activity has been designed to avoid and/or minimize adverse effects, both temporary and permanent, to regulated waters:	The trail alignment has been designed to avoid waters to the extent practicable and will be field-fit/micro-sited to minimize and avoid impacts to wetlands, special status plant species, minimize erosion, and support longevity and sustainability of trail design so as to limit long term maintenance and additionally trail work or multiple construction entries at the site. The trail and associated infrastructure are designed to and will be maintained to prevent erosion and sedimentation. See the project's BMPs in the above box for specific measures.
Describe any compensatory mitigation planned for this project (if applicable):	N/A - compensatory mitigation will not be required.

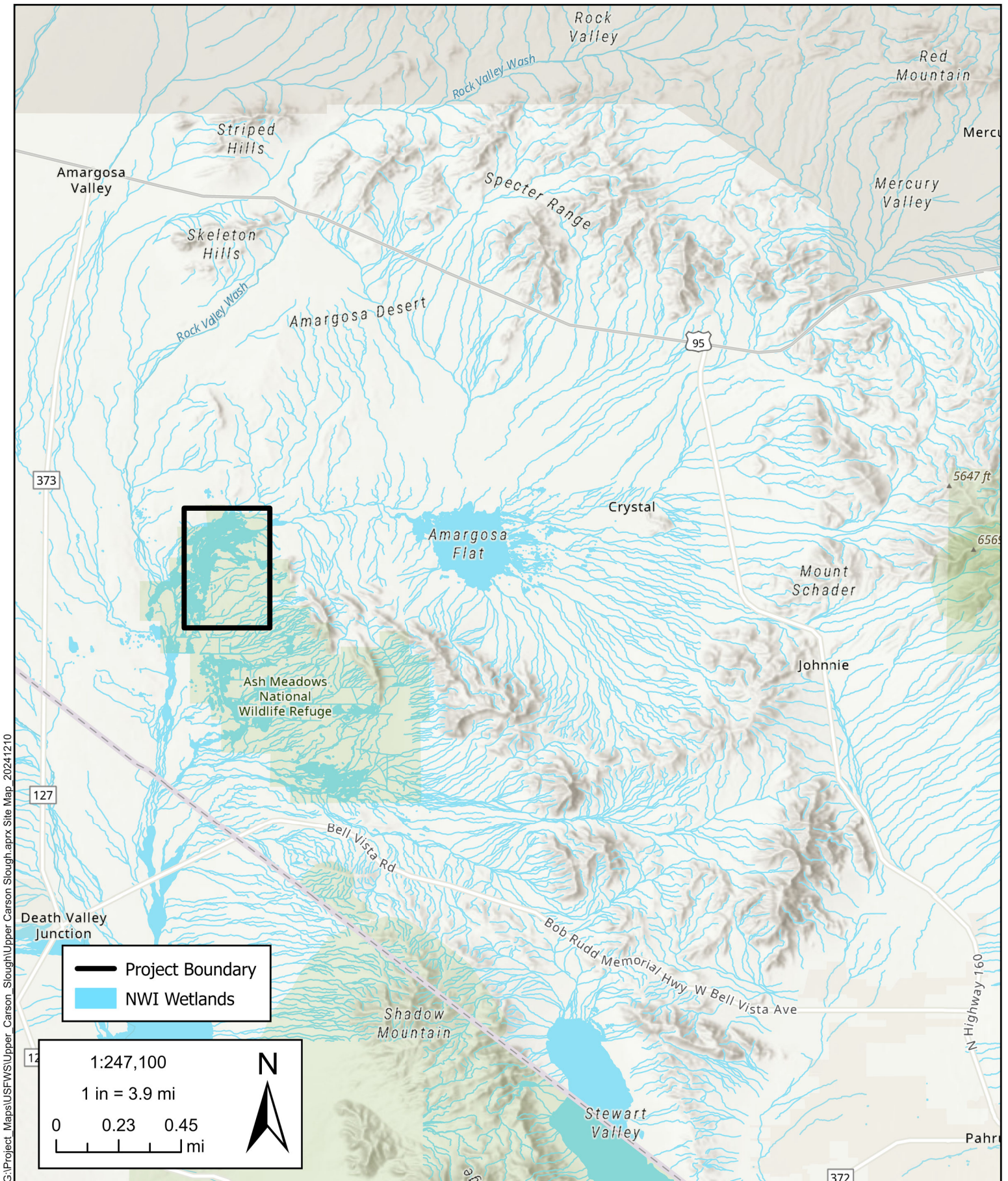
**D. Signature**

Name and Title (Print):  Kevin DesRoberts	Phone Number:  (702) 515-5451	Date:  12/16/24
 <hr/> Signature of Responsible Official		


**Mandatory Attachments:**

- **Federal Permit or License Identification:**
  - Project proponents seeking a federal general permit or license must include a copy of the draft federal license or permit and any readily available water quality-related materials that informed the development of the draft federal license or permit, or;
  - Project proponents seeking a federal individual permit or license must include a copy of the federal permit or license application and any readily available water quality-related materials that informed the development of the federal license or permit application.
- **Site Map** - A map or diagram of the proposed project site including project boundaries in relation to regulated waters, local streets, roads, and highways.
- **Engineered Drawings** - Engineered drawings are preferred to be submitted at the 70% design level. If only conceptual designs are available at the time of application, plans for construction should be submitted prior to the start of the project. Specific locations of the proposed activities and details of specific work elements planned for the project should be identified (e.g., staging areas, concrete washouts, perimeter controls, water diversions, or other BMPs).

Submit the completed application materials to NDEP ([ndep401@ndep.nv.gov](mailto:ndep401@ndep.nv.gov)) with the appropriate U.S. Army Corps of Engineers Regulatory Office copied on the communication (<http://www.spk.usace.army.mil/Missions/Regulatory/Contacts/Contact-Your-Local-Office/>).



G:\Project\_Maps\USFWS\Upper\_Carson\_Slough\Upper\_Carson\_Slough.aprx Site Map\_20241210

	PRINT DATE	PROJECTION	PROJECT NAME	<h1>Site Map</h1>
	December 10, 2024	NAD83	Upper Carson Slough Backcountry Trail Project	
	PROJECT NUMBER	PROJECT MANAGER		
	23013	T. Harju		
		CARTOGRAPHER		
		J. Berg		

# Upper Carson Slough Backcountry Trail Project Narrative

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## Final 35% Design – Task 5



Prepared for:  
U.S. Fish and Wildlife Service  
610 East Spring Meadows Road,  
Amargosa Valley, NV 89020

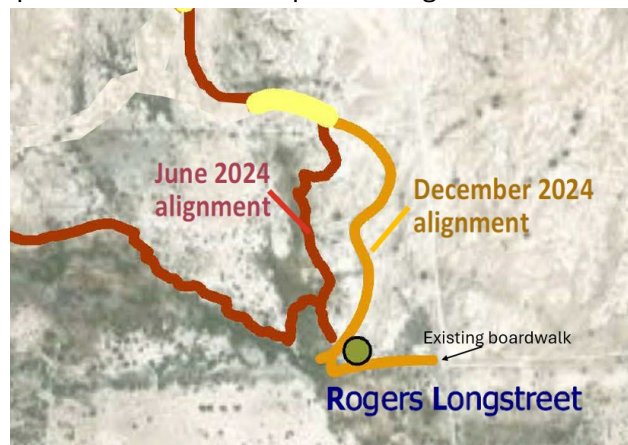
**June 14, 2024**

Prepared by:  
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## Note of changes and clarifications from June 14, 2024 – December 15, 2024.

This page documents changes and clarifications to information in the Upper Carson Slough Backcountry Trail 35% Design Document dated June 14, 2024, that were incorporated during the permitting phase of this project with U.S. Corp of Engineers (USACE) and Nevada Department of Environmental Protection regarding the Section 404 and 404 of Clean Water Act (CWA) applications. The following changes and adjustments are as follows:

- The Section 106 compliance process conducted in support of the Section 401 and 404 permits, resulted in a trail alignment change on the southern end of the Rogers-Longstreet trail. The June 2024 trail alignment in this area was reverted back the 2011 trail alignment (Source: Otis Bay; The Upper Carson Slough Backcountry Trail Plan Final, March 9, 2011), and labeled as the December 2024 alignment to illustrate that the change in alignment was made after the submittal of the 35% Design. The clipped image below shows the change in alignment. This change in alignment results in fewer impacts to wetlands and other sensitive resources. Impact calculations included in the 401/404 permitting packages are based on the revised post-section 106 compliance alignment.



- Some information required for 401/404 permit documentation was not explicitly described in the 35% design. The 401/404 permit package should be carefully followed during final construction planning. A list of these clarifications include:
  - Information on bridge footing/mudsill materials and placement is clarified in the 401/404 permit package. In summary:
    - “The crossings and boardwalk may have variable decking/surface depending on procurement with design/build contractor with the intent to integrate with the natural setting, while being low maintenance and weather resistant. The supports are currently proposed to be 4 by 10 Fiber Reinforced Polymer (FRP) footers/mudsill set on the ground surface, with cross bar supports placed at the surface at intervals, if needed depending on structural integrity of decking.”
  - The location of the vault toilet may be adjusted but will be placed in upland or on previously disturbed ground.

- o To achieve the 2% cross slope and 5% running slope (as written in the 35% design), and to accommodate future operation & maintenance needs, an assumption of 1 cubic yard (CY) per linear foot (LF) of impact area/material cut and fill was made to conservatively over-estimate potential soil movement in the new wetland impact areas. This will consist of smoothing out the trail surface using material within the 3 foot wide alignment, as well as accounts for some imported gravel during maintenance phases, that may be placed in frequently flooded areas.
- o All trailhead information, wayfinding, overlook, and regulatory signs will be installed in upland or previously disturbed areas and will not create new wetland impacts. Concrete will not be placed in wetlands in association with footings for signage.
- o Passing spaces along the trail will be constructed in upland and/or previously disturbed areas. The distance between passing spaces may adjust to avoid the placement lying within new wetland disturbance trail sections. Maximum spacing between passing spaces is 1,000 feet (as written in the 35% design).

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## Acronyms and Abbreviations

ABA	Architectural Barriers Act
acc.	Accessible
A-E	Architectural and Engineering
Alta	Alta Science & Engineering, Inc.
AMNWR	Ash Meadows National Wildlife Refuge
DNWRC	Desert National Wildlife Refuge Complex
EA	Environmental Assessment
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FIRM	Flood Insurance Rate Map
FRP	Fiber Reinforced Polymer
NOAA	National Oceanic and Atmospheric Administration
NDEP	National Pollutant Discharge Elimination
NWG	Newe and Nuwu/Nuwuvi Working Group
O&M	Operation & Maintenance
SOW	Scope of Work
SWPPP	Storm Water Pollution Prevention Plan
UCS	Upper Carson Slough
USFWS	U.S. Fish and Wildlife Service
WRCC	Western Regional Climate Center

## Units

°F	degrees Fahrenheit
mi	miles
SF	square feet

## Section 1 Summary

The Upper Carson Slough (UCS) Backcountry Trail Project is located in the Ash Meadows National Wildlife Refuge (AMNWR) in Amargosa Valley, Nevada. The UCS is located in the northern end of the refuge and provides critical habitat for the area.

Prior to the establishment of the refuge, much of the area had been developed to provide water for agriculture and other uses (USFWS 2022). The UCS was developed in this manner, which ultimately led to the degradation of its springs and wetland habitat. However, the successful implementation of restoration efforts in 2014 has restored the function of the UCS springs and provided the foundation for habitat recovery.

Following the 2014 restoration efforts, a backcountry trail system was planned for the UCS to provide a new visitor experience for the refuge that differed from the boardwalks and interpretive elements currently offered.

The U.S. Fish and Wildlife Service (USFWS) contracted Architectural and Engineering (A-E) services with Alta Science and Engineering, Inc. (Alta) to develop a backcountry trail system that included improved access to the UCS, new hiking trails, and a new interpretive design describing the unique ecology of the area and its connection to the indigenous Newe and Nuwu/Nuwuvi people.

Specific A-E design components targeted for the project were:

- An interconnected foot trail system throughout the UCS showcasing the unique ecology of the area.
- Low-profile water crossings where needed along trail alignments.
- Overlook areas.
- A vault toilet at the Peterson Reservoir Parking Area.
- Improvement of existing parking areas and creation new parking areas for visitor access.
- An interpretive story that provides new exhibits and narrative designs for the trail system.

The goal of the A-E services contract was to provide a schematic design package that included the necessary information to compile design-build scopes-of-work (SOW) for the project. That includes a design-build narrative, an engineer's opinion of probable construction cost, design drawings, accessibility determination, and design for the interpretive experience.

This document presents the design narrative for the Final 35% Design package for the UCS Backcountry Trail Project. The intent of this narrative is to describe the recommended design elements, including the trail design, infrastructure details, and interpretive design. Each of these elements are described in the following sections of this report.

### 1.1 General Context

Managed by the USFWS, AMNWR is part of the Desert National Wildlife Refuge Complex (DNWRC) and encompasses over 23,000 acres of spring-fed wetlands and alkaline desert uplands (USFWS 2024). The DNWRC consists of four separate refuges that each work to preserve unique desert ecosystems.

Established in 1984, AMNWR was created to conserve and recover listed endangered, proposed endangered, and candidate plant and animal species found in the area (USFWS 2022). AMNWR is an oasis of the Mojave Desert with an ecosystem that 26 rare plant and

animal species found nowhere else in the world call home. Habitat for these species is provided by an estimated 50 seeps and springs that provide approximately 17,000 acre-feet of water for the refuge each year (USFWS 2022).

For decades, dedicated groups have worked to rehabilitate AMNWR to much success. Restoration efforts will continue and the UCS Backcountry Trail Project aims to augment those efforts by providing refuge visitors with new opportunities to connect and learn about the area and the hard work required to restore it.

## **1.2 Project Goals**

The primary goal of the UCS Backcountry Trail Project is to create a backcountry hiking, hunting, and nature exploration opportunity for AMNWR visitors (USFWS 2022). Currently, more highly developed visitor areas are available including the AMNWR visitor center and boardwalks with interpretive exhibits. Some hunting access is available in the UCS but is generally limited to areas with short sections of defined trail and existing two track roads.

The trail system would support visitor access to the area through parking area improvements and creating new hiking trails that would offer visitors new opportunities to experience nature in a less developed setting.

New interpretive displays designed with the help of Newe and Nuwu/Nuwuvi Working Group (NWG) will provide visitors with educational opportunities to learn about the cultural significance that these ancestral lands have for the indigenous people of the area.

The backcountry trail system will support the mission of AMNWR by enhancing the understanding of the ongoing restoration efforts and fostering a greater connection between refuge visitors and the UCS by highlighting the cultural and ecological importance of the area.

## **1.3 Basic Design Strategy**

The UCS has a variety of desert habitats that provide several diverse nature exploration opportunities for visitors of AMNWR. There are also existing visitor features with opportunities for improvement to further enhance the visitor experience. The primary trail design was to improve these existing visitor areas and connect them with a backcountry trail system that will provide visitors greater exposure to the diverse habitats of the UCS while minimizing new disturbance in the area.

The design strategy started with the 2011 conceptual trail design (Otis Bay 2011a), incorporated new data and field information, refined the design layout, and gathered stakeholder input for further layout adjustments.

The final deliverables for this project are a summation of the collaborative design process used on this project. The design elements presented in the drawings, cost opinion, and this report are the result of an iterative design and review process with USFWS and NWG.

## **1.4 Previously Completed Planning Efforts**

In 2011, a conceptual trail design was developed (Otis Bay 2011a) for the UCS that included many of the targeted design elements mentioned previously (Section 1) and was used as one of the primary planning and design references.

In February 2023, USFWS staff walked the proposed trail alignments from the 2011 plan as an initial scouting effort to determine general trail suitability. Water tables are typically at their peak

elevations during this time of year, so this trail reconnaissance was able to identify a number of potential obstacles that resulted in recommended modifications to the 2011 trail alignments.

A project kick-off meeting in May 2023 included a focused discussion to identify opportunity and stakeholder desires, as well as practical, administrative, and ideological constraints for the UCS Backcountry Trail system (Alta 2023). The A-E team broadly summarized and categorized themes identified at the kick-off meeting and used them to create design criteria. These criteria did not necessarily work synonymously with each other (i.e., maximizing one theme/criteria may result in the minimization of another criteria). These criteria were augmented with more metrics as the design process progressed.

In June 2023, the A-E team and USFWS staff marked preliminary trail alignments in the field to ground truth the concepts and assess the viability of carrying these concepts forward in the design process. This trail marking effort provided valuable insight on how each design criteria may be applied, as well as informing practical limitations for each conceptual trail segment.

In September 2023, following seasonal monsoonal rains and extreme weather patterns brought on by Hurricane Hilary, an emergency trail assessment was performed by the A-E team with the assistance of USFWS staff. This effort allowed the A-E team to observe how the trail alignments responded to severe surface runoff within the 100-year floodplain. Like the first trail marking event, this emergency assessment provided valuable feedback that helped inform future trail design choices and discussions with project partners.

A final in-person workshop took place in January 2024, where the A-E team, USFWS, and NWG discussed the design and walked short sections of the proposed trail alignments. Like previous field work events, this workshop was an important design milestone that generated valuable group discussion and allowed more members of the design group to experience the proposed trails firsthand.

## 1.5 Design Criteria

Design criteria have been refined throughout the design process, based on review and input from the USFWS staff, NWG, and the A-E team. Initial design criteria were derived from the focused discussion at the project kick-off meeting, the June 2023 trail marking with USFWS staff, and from technical guidance and engineering standards.

Technical guidance and engineering standards that outline the best practices and methods for trail design and construction on federally managed public lands are adhered to in the design. Sources included: *Outdoor Developed Areas accessibility guidance (USAB 2014)*, *Federal Highway Administration (FHWA) Highway Design (FHWA 2018)*, and discussions with construction contractors and material vendors.

Design criteria identified at the beginning of the project with stakeholders were:

- Include the NWG
- Low impact
- User experience is uniquely backcountry
- ABA compliant
- Budget and schedule limitations
- Minimize mid- to long-term maintenance
- Responsible land use and respect

## 1.6 Design Layout Summary

The design is comprised of four backcountry trails, two improved and two new parking areas, and three overlooks (Table 1). Each trail segment underwent individual decision-making for its alignment, constructability, type of ecosystem it traversed, and level of disturbance. The proposed trail system is divided into four primary trail segments (further summarized in Table 1):

- Peterson Reservoir Trail
- Cold Spring Trail
- UCS Loop Trail
- Rogers Spring and Longstreet Spring (Roger-Longstreet) Loop Trail

The proposed trail system consists of approximately 8.09 miles (mi) of recommended trail routes. The trail system uses a mix of new trail segments and existing infrastructure features such as USFWS administration roads, two-track access paths, and inactive irrigation infrastructure (Table 1). Much of the system is found within the effective 100-year floodplain and moves between the desert upland and wetland habitats of the UCS.

The naming for the trails presented in this narrative and design are preliminary and subject to change. Further collaboration between USFWS and NWG will determine the final trail names.

In Appendix A, an overview map of the proposed alignments is available on Sheet S2, design sheets for each trail are shown on Sheets S4-S7 and overlooks and parking areas are shown on Sheets S8-S12.

**Table 1. Design Summary**

Trail Segments	Associated Features	Trail Lengths (miles)					Trail, Parking, and Overlook Features			
		Total Length	Within 2011 Delineated Wetlands	New Trail	Existing Two-Track Path	Existing Road	Low-profile Stream Crossings	Interpretive Signage	Parking Spaces	Additional/Optional Features
Peterson Reservoir Trail	<ul style="list-style-type: none"> <li>Upgrades to existing Peterson Reservoir Parking Area</li> <li>Vault toilet</li> <li>Peterson Reservoir Overlook</li> </ul>	0.84	0.04	0.77	0.07	0	1	<ul style="list-style-type: none"> <li>1 Trailhead information sign</li> <li>1 Wayfinding sign</li> <li>1 Interpretive overlook display</li> </ul>	5+1 acc.	<ul style="list-style-type: none"> <li>Up to 3 benches at overlook</li> <li>Trail edging</li> <li>2 mile markers</li> <li>2 regulatory markers</li> <li>2 directional markers</li> <li>1 acc. parking sign</li> </ul>
UCS Loop Trail	<ul style="list-style-type: none"> <li>Upgrades to existing Rogers Spring Parking Area</li> <li>Rogers Spring Overlook</li> <li>Roadside Overlook</li> <li>Roadside Parking Area</li> </ul>	3.56	1.95	1.47	0.86	1.23	1	<ul style="list-style-type: none"> <li>1 Trailhead information sign</li> <li>1 Wayfinding sign</li> <li>2 Interpretive overlook displays</li> </ul>	<ul style="list-style-type: none"> <li>Rogers Spring, 4+1 acc.</li> <li>Roadside, 4+1 acc.</li> </ul>	<ul style="list-style-type: none"> <li>Boardwalk surfacing</li> <li>Up to 4 benches</li> <li>Access control plants</li> <li>7 mile markers</li> <li>4 regulatory markers</li> <li>2 directional markers</li> <li>2 acc. parking signs</li> </ul>
Cold Spring Trail	<ul style="list-style-type: none"> <li>Hunter's Access Parking Area</li> </ul>	2.14	1.60	1.22	0.82	0.10	2	<ul style="list-style-type: none"> <li>1 Trailhead information sign</li> <li>1 Wayfinding sign</li> </ul>	5+1 acc.	<ul style="list-style-type: none"> <li>4 mile markers</li> <li>2 regulatory markers</li> <li>1 directional marker</li> <li>1 acc. parking sign</li> </ul>
Rogers-Longstreet Loop Trail	<ul style="list-style-type: none"> <li>NA; Connects to UCS Loop Trail and existing Longstreet Parking Area</li> </ul>	1.55	0.25	1.12	0	0.43	0	<ul style="list-style-type: none"> <li>1 Trailhead information sign</li> </ul>	NA	<ul style="list-style-type: none"> <li>3 mile markers</li> <li>2 regulatory markers</li> <li>2 directional markers</li> </ul>

<sup>1</sup>Approximately 0.83 miles of new trail for the UCS Loop Trail utilizes and inactive irrigation berm.

<sup>2</sup>Approximately 0.23 miles of new trail for the Rogers-Longstreet Loop Trail utilizes a berm of heavily disturbed material.

## 1.7 Construction Site Access

AMNWR is approximately 90 mi northwest of Las Vegas, Nevada and 44 mi east of Death Valley National Park.

The UCS is located northwest of the AMNWR visitor center. All roads on the refuge are dirt and gravel but are frequently maintained for vehicle traffic (USFWS 2024). Rainfall and surface runoff are particularly hard on the refuge roads creating slick, muddy conditions that result in damage to roads and road closures.

Several two-track dirt paths exist in UCS and are actively used by USFWS staff for access to perform typical refuge operations. Some of these two-track paths will be utilized for the proposed trail system.

On-site camping has been discussed as an acceptable arrangement for the construction contractor personnel during construction. On-site camping must receive formal approval from USFWS.

## 1.8 Climate

Located in the lowland desert region of southern Nevada, AMNWR experiences long, hot summers and short, mild winters (WRCC 2024a). USFWS recommends fall and spring as the best seasons to visit the refuge (USFWS 2024).

The nearest weather station to AMNWR is station number 260150 located in Amargosa Valley, Nevada. As part of the Western Regional Climate Center's (WRCC) collection of National Oceanic and Atmospheric Administration (NOAA) cooperative weather stations, the period of record for this station is December 1, 1965 to July 31, 2014 (WRCC 2024b).

Summer temperatures frequently go above 100 degrees Fahrenheit (°F), so the best summer visiting hours are in the morning. The UCS does experience freezing temperatures. However, the freeze-free season is over 225 days annually. From 1965 to 2014 the average annual max temperature was 81.3°F and the average annual minimum temperature was 48.5°F (WRCC 2024b).

Average annual precipitation for the area is 4.33 inches (WRCC 2024b). Winter brings the greatest likelihood of precipitation with an average of 1.94 inches. Most of the precipitation that falls is rain. The average annual snowfall depth is 0.30 inches (WRCC 2024b). Occasionally, the refuge experiences late summer monsoons that bring heavy rains.

## 1.9 Environmental Impact

The project's design follows the recommendations of the proposed action from the 2013 UCS Environmental Assessment (EA). The summary of impacts determined that the proposed action would have no significant impacts on (Bio-West 2013):

- Air Quality
- Threatened and Endangered Species
- Cultural and Historical Resources
- Recreation
- Invasive and Nonnative Plants and Animals

- Wetlands
- Migratory Birds

### **1.10 Regulatory Requirements**

All regulatory permits will need to be prepared and obtained by the Contractor. Potential permits for this project include, but are not limited to:

- State of Nevada
  - Nevada National Pollutant Discharge Elimination (NDEP) Temporary Work Waterways
  - Nevada Storm Water Pollution Prevention Plan (SWPPP)
- Clean Water Act
  - Section 401
  - Section 404

According to the Federal Emergency Management Agency's (FEMA) Flood Insurance Rate Map (FIRM) number 32023C8575E, much of the project area is located within the 100-year floodplain. The project's design elements are minor enhancements and will not have an effect on the base flood elevation; therefore, the project does not warrant evaluation or revision of the FIRM panel (Bio-West 2013).

Clearing of vegetation during construction along trail alignments must occur outside of the migratory bird breeding season of March 15 through August 15 (USFWS 2022).

### **1.11 Engineer's Opinion of Probable Construction Cost**

The engineer's opinion of probable construction cost is attached as Appendix B.

The base bid items included in the estimate represent the recommended material options and minimum expected workmanship required to complete the construction of the design and accomplish project goals. Given the variability of pricing and availability of labor and materials, deviations from the recommended design are allowable if approved by USFWS. At a minimum, any deviations should be shown to maintain or improve the level of quality expected from the design.

USFWS has requested that the design be presented with a recommended phasing approach for construction to account for uncertainties around scheduling and funding availability. To aid this request and future decision making, the cost opinion is broken down into the phases described in Section 1.13.

### **1.12 Accessibility**

The UCS Backcountry Trail Project was designed to comply with the standards and requirements of the Architectural Barriers Act (ABA) to the maximum extent practicable. Appendix C includes the Accessibility Checklist; the proposed design meets all ABA requirements, with the exception of having a stable surface during all seasons [Appendix C, 1015.5 and 1017.2]. Trail features that do not meet accessibility requirements are exempted due to the condition for Exception 3 provided by the U.S. Access Board's *Outdoor Developed*



Areas guidance document (USAB 2014). The condition for Exception 3 states that, “compliance would fundamentally alter the function or purpose of the facility or the setting.”

The purpose of the project is to provide new opportunities to explore the backcountry in ways that differ from the front country options that already exist on the refuge. Through collaboration with USFWS and NWG it was determined that this meant creating a backcountry experience that is noticeably simpler and less developed than the boardwalks and overlooks available at present on the refuge providing a new experience for visitors. To meet the ABA requirement of having a stable surface during all seasons, trail surfaces would need to be raised and compacted with imported material, which is a level of development similar to front country attractions and in contradiction to the purpose and goals of the project.

The setting of the project is in, and adjacent to, a flood-prone wetland. One of the project requirements is to minimize habitat and hydrological alteration, including avoiding wetland and marsh areas to the maximum extent practicable (USFWS 2022). Raising the trail elevation and importing material to maintain stability year-round would create a significant negative impact on both site hydrology and existing habitats.

### **1.13 Construction Phasing**

The design is presented with a phased approach to construction to account for funding allocation and changes in construction timing. Project construction and phasing will follow specific bid schedules. For planning purposes, the following design features are listed as potential phasing options, as they can be constructed as complete packages for visitors (i.e., they each provide a parking, hiking, and interpretive experience).

1. Construct the UCS Loop Trail and all associated features (including the nearby Roadside Overlook). See Table 1 for required and additional/optional features.
2. Other phases that can be constructed as a ‘complete package’ include:
  - a. Peterson Reservoir Trail and its associated features. See Table 1 for required and additional/optional features.
  - b. Cold Spring Trail and its associated features. See Table 1 for required and additional/optional features.
  - c. Rogers-Longstreet Loop Trail and its associated features. See Table 1 for required and additional/optional features.

## **Section 2 Trail Design**

The A-E team balanced several pieces of information when considering alternatives for each potential trail segment. Alternatives were based on:

1. Information gleaned from the NWG Workshop, kick-off meeting, and background documents.
2. Field-tested alignments that were walked by USFWS staff in February 2023 (USFWS 2023). The alignments walked by USFWS staff in February 2023 were intended to identify parts of previously proposed trail alignments that either A) seemed feasible to navigate and have relatively dry conditions, or B) may have substantial obstacles either in constructability or long-term maintenance.
3. Base site data, including:

- a. AHME Soils (NRCS Web Soil Survey 2023) and (Otis Bay 2011b)
  - b. Wetlands (Otis Bay 2011b)
  - c. Sensitive plant habitats (Otis Bay 2011a)
  - d. Aerial imagery (National Agriculture Imagery Program - 2019)
  - e. Topography (Otak Topographic Survey – 2023)
4. Balancing the length of trail utilizing existing features (i.e., road and two-track dirt path) compared to the new areas that require an entirely new trail to be constructed.
  5. The likelihood of trail segments being ABA compliant.
  6. Metrics listed in the project’s nomination, such as the number of trail miles to be built, stream crossings, parking lots, vault toilets, interpretive signs, etc.

The design trail alignments are proposed as 50-foot-wide corridors to allow for flexibility during construction to accommodate either accessing additional desirable habitats and/or unforeseen field conditions that impact trail constructability. These corridors were previously screened during the field work events as part of the basic design strategy to avoid rare plants, sensitive habitats, biological soil crusts, culturally significant areas, and unsafe terrain to the maximum extent possible. All trails are designed to comply with ABA requirements to the maximum extent practicable.

Each trail is designed with the following standard features:

- Avoids impacting surface hydrology to the maximum extent practicable.
- Minimum 36-inch clear tread width.
- Graded and compacted native soil tread surface.
- Removal of any tread obstacles greater than 2 inches in height while maintaining a minimum separation distance of 48 inches between obstacles.
- Trail running slopes to be no greater than 5% where practicable. Slopes greater than 5% are allowable under the following conditions:
  - 5% to 8.33% for no more than 200 feet.
  - 8.33% to 10% for no more than 30 feet.
  - 10% to 12% for no more than 10 feet.
  - No more than 30% of the total length of a given trail may have a running slope exceeding 8.33%.
- Trail cross slopes to be no greater than 2% where practicable. Cross slopes up to 5% are allowable to facilitate drainage.
- Removal of any protruding objects that interfere with the trail's clear tread width. Protruding objects must be cleared a minimum of 1 foot outside the trail's clear tread width. This clearing limit should be maintained to the extent practicable while the trails are in operation.
- Clearing limit heights above the trail surface should be 7 to 8 feet.
- Install passing spaces at intervals of at least every 1000 feet.

- Passing spaces must be a minimum of 60 inches by 60 inches or at an intersection of two trails providing a T-shaped space that extends a minimum of 48 inches beyond the intersection.
- Passing space locations should be prioritized in areas that have advantageous terrain and habitat, where disturbance will be minimized.
- Trail edging applied to the first 100 feet of trail beginning at the trailhead. The preferred edging material is tufa rock, which is widely used in other areas on the refuge. When tufa rock is unavailable, trail edging may be accomplished using signage, revegetation, metal railing, or another alternative as directed by USFWS.
- Mile marker signs will be installed every 0.5 miles along the trails.
- Three wayfinding signs will be installed at trail junctions.
- Optional directional and regulatory signage to help visitors navigate the trail system safely will be administered in the future by USFWS if needed.
- Recommended stream crossings will be 4 feet wide, low-profile timber and fiber reinforced polymer (FRP) puncheons. The substructure of the crossings will be constructed of chemically inert FRP, and the decking will be constructed of timber.
- Maintain a minimum separation of 25 feet from the edges of stream channels and the edges of trails that are parallel to streams.

One optional trail alignment is shown for the UCS Loop Trail in the design drawings (Appendix A). This route was scouted during the trail marking exercises to provide an alternative route around potential obstacles and to provide stakeholders with another viable trail alignment to review. This route was ultimately not selected as part of the recommended design in favor of a loop trail alternative that connects the Rogers-Longstreet Loop Trail and the UCS Loop Trail.

## **2.1 Peterson Reservoir Trail**

The Peterson Reservoir Trail segment is an out-and-back trail (Sheet S4, Appendix A) that connects the Peterson Reservoir Parking Area with the overlook to the north of the reservoir. From the overlook to the north, the trail continues to the Cold Spring Trail, offering users longer hiking options and connection to the northern half of the UCS trail system. The Peterson Reservoir Trail alignment is an almost entirely new trail segment that only uses a short section of an existing two track pathway (Table 1).

The trail briefly crosses through wetland and riparian environments and requires a minimum stream crossing of approximately 20-feet across the Peterson Reservoir inlet channel. The rest of the trail stays in upland habitat, meandering through dense shrubs and grasses as well as open desert areas.

Shrubs and grasses will need to be removed along the entire alignment. Tall, dense grass and select shrubs will need to be removed near the stream crossing.

The trail alignment crosses through some areas showing a high-water table approximately 0.16 miles from the trailhead. This indicates that users may encounter saturated soils and muddy conditions in some areas during the year. Slightly muddy conditions were encountered immediately adjacent to the stream channel in September 2023. Surface runoff from the elevated natural berms at the proposed location of the Peterson Reservoir overlook have created significant scarring in the ground surface. These should be avoided during construction.

## 2.2 UCS Loop Trail

The UCS Loop Trail (Sheet S5, Appendix A) connects Rogers Spring, Cold Spring Trail, and the Rogers-Longstreet Loop Trail. This loop provides connections between trailheads, creates the longest hiking option, and travels through the highest variety of habitats and an authentic backcountry experience.

This alignment utilizes a combination of new trail and existing infrastructure features (Table 1). The new trail is primarily along an old irrigation berm near Rogers Spring and through the center of the UCS, a two-track dirt path on the western portion of the UCS, a short section of existing road on the east side of the UCS, and Longstreet Spring Road.

A section of boardwalk of at least 25-feet long will be needed to traverse a marsh and stream crossing near the center of the UCS. The boardwalk section should match the boardwalk design used at other locations on the refuge and tie into the low-profile stream crossing.

Vegetation removal will be needed on substantial portions of this trail, specifically along the existing irrigation berm and near the stream crossing. Initial data review indicated that some rare plants may have been present along the middle portion of the irrigation berm, but the trail marking exercises yielded no signs of rare plants within the recommended trail corridor. Rare plants were observed along the centerline of the roadway segment of the trail north of Rogers Spring in September 2023.

## 2.3 Cold Spring Trail

The Cold Spring Trail (Sheet S7, Appendix A) connects the UCS Loop Trail to the Hunter's Access Parking Area and the Peterson Reservoir Trail. The trail is a combination of new trail sections intermixed with an existing two-track dirt path (Table 1).

Two stream crossings are needed for this trail. One is located at a large surface runoff scar located to the east of the southern terminus of the two-track path. This runoff scar is not an active flow channel, but instead receives flow from surface runoff following flood events. The second crossing is located a little further to the southeast and crosses a spring outflow channel.

Vegetation removal will be needed over long portions of the trail, primarily dense grasses and large shrubs.

Evidence of soil saturation has been observed along portions of the Cold Spring Trail. All trails will be routed around wet ground when practical during construction; however, this trail warrants additional attention for the amount of seasonally saturated soil.

## 2.4 Rogers Spring and Longstreet Spring Loop Trail

The Rogers-Longstreet Loop Trail (Sheet S6, Appendix A) is a route connecting Longstreet Spring, Rogers Spring, and the UCS Loop Trail. The trail uses a combination of existing infrastructure and new trail segments to complete the loop (Table 1).

During field marking, sensitive plant areas, biological soil crusts, and tribal cultural areas were observed within the vicinity of the loop trail. The proposed alignment avoids these areas to the maximum extent possible. USFWS should be consulted on specific or general locations to avoid during construction.

Like the other trails vegetation removal will be required along much of the alignment. However, the trail utilizes an existing USFWS admin road and disturbed berm of quarried soil, so this will reduce the amount of vegetation removal required.

## Section 3 Parking Area Design

Parking area design includes improvements for two existing areas and the development of two new areas.

Each parking area is designed with the following standard features:

- Standard cross section includes 8 inches of Type II crushed aggregate base and 3 inches of 1-inch minus crushed aggregate surface material.
- Parking areas will tie into existing ground elevations surrounding the parking areas and graded to drain.
- All parking spaces will be delineated with 6-foot-wide concrete stop blocks secured with metal stakes/rebar.
- Parking space widths are based on the recommended dimensions provided in the ABA Accessibility Standards guidance (USAB 2024). Each standard parking space, accessible parking space, and accessible loading zone will be 8 feet wide.
- Each parking space will be 20 feet long.
- Each parking area will have an accessible parking space with adjacent loading zone. These accessible spaces and loading zones will be installed on a concrete pad of 4-inch reinforced concrete at each parking area. Each concrete pad will be painted with striping compliant with accessibility standards.
- Each accessible parking space at each parking area will be identified with the international symbol of accessibility complying with Section 703.7.2.1 of the ABA standards (USAB 2024). The symbol will be presented on a parking sign installed on a signpost, where the bottom edge of the sign measures at least 60 inches high from the ground surface.
- Delineate the edges of the parking areas with tufa rock. USFWS must approve the use of alternate materials if such material is deemed necessary for construction. Metal railing is used around the edges of other parking areas on the refuge.
- Any areas disturbed during construction beyond the final layout of the parking areas must be revegetated with nursery stock approved by USFWS.
- Create an Outdoor Recreation Access Route that connects accessible parking with all trailhead facilities and viewing areas (page 35 of Outdoor Guide) (USAB 2014).
- A trailhead information sign will be installed at each parking area, except for the UCS roadside overlook pullout.

### 3.1 Peterson Reservoir Parking Area

The Peterson Reservoir Parking Area (Sheet S8, Appendix A) is located at the trailhead of the proposed Peterson Reservoir Trail. The purpose of this parking area design is to improve the existing parking area for hunting and hiking access. Primary improvements to the parking area in the draft design include expanding the parking surface and installing a single room vault toilet.

The single room vault toilet will match the restroom design at the Longstreet Spring Parking Area. The recommended installation location is on the eastern edge of the parking area with the vent stack facing southwest and the access opening facing west.

Expanded parking will accommodate five standard vehicle space and one accessible space with a loading zone. This expansion will require the placement of approved native fill or imported crushed aggregate materials.

A 5-foot-wide concrete sidewalk with an access ramp compliant with accessibility standards would also be constructed. Parking spaces oriented at approximately 90-degrees and delineated with 6-foot-wide concrete parking stop blocks.

The existing ground material will be excavated to place the gravel surfacing to be flush with the surrounding ground surface. Material generated can be reused for fill if suitable to expand parking lot area as shown on the drawings.

### **3.2 Rogers Spring Parking Area**

The Roger Spring Parking Area (Sheet S12, Appendix A) will be improved with new gravel surfacing and parking space arrangements.

The existing parking surface will be excavated and replaced with the design gravel cross section.

Parking spaces will be oriented at approximately 90 degrees on the east side of the parking area against the existing rock barrier. One accessible space, one loading zone, and four passenger vehicle spaces will be delineated using concrete stop blocks. No parking will be allowed on the west side of the area to prevent potential conflict with USFWS access to the admin road to the west and Longstreet Road to the north. The southeastern corner of the proposed parking area is recommended to expand outside of the existing parking area extents. This will enable better parking space orientation. Some of the existing tufa rock will need to be relocated to accommodate this.

The expansion of the Rogers Spring Parking Area also encroaches on an area to the east that had been previously identified as a location containing rare plants. This area should be verified to be rare plant free prior to expanding the parking area during construction. Areas containing rare plants are to be avoided and *Mitigation Measures #3 and #4* in Section 4.2.3 on page 35 of the EA/Finding of No Significant Impact (FONSI) (Bio-West 2013) shall be followed. If rare plants are identified in the proposed expansion area, it is recommended that the parking area extents be reduced to avoid the rare plants, likely eliminating at least one proposed parking space.

### **3.3 Hunter's Access Parking Area**

The Hunter's Access Parking Area (Sheet S10, Appendix A) is a new parking area at the intersection of S. Peterson Road and Patch of Heaven Road along the proposed Cold Spring Trail alignment.

The parking area will use the existing open space adjacent to the intersection to delineate five standard parking spaces and one accessible space with a loading zone for hiker access. The parking area will be constructed without removing large shrubs and trees (Sheet S10 shows approximate location of vegetation to preserve).

The parking spaces will be 8 feet wide and 20 feet long and are oriented at 75-degree angles with. Each space will include a 6-foot-wide concrete parking stop block and the entire parking area will be delineated with tufa rock edging.

If approved, material generated from parking lot construction can be reused for the project in other areas that require filling, such as the Peterson Reservoir Parking Area.

### **3.4 Roadside Overlook Parking Area**

The Roadside Overlook Parking Area (Sheet S11, Appendix A) is proposed to be constructed on an existing earthen mound along the western edge of S. Longstreet Road in between Rogers Spring and Longstreet Spring.

Approximately four standard parking spaces and one accessible space with a loading zone are designed in the existing pull-out space on the west side of the road. Each parking space is 8 feet wide by 20 feet long and oriented perpendicular to the road. Each parking space will be delineated with a concrete parking stop block.

The edges of the parking area will be delineated by tufa rock or other USFWS approved edging.

## **Section 4 Overlook Design**

Overlook area design includes the development of three new overlooks.

Each overlook area is designed with the following standard features:

- A minimum of 36-inch by 48-inch clear ground space must be provided at each distinct viewing location.
- Viewing space must be cleared of obstructions between 32 inches and 51 inches above the ground. The cleared limits must extend the full width of the clear ground space.
- A turning space of at least 60 inches must be available at all viewing areas of an overlook.
- The surface of the overlooks must be firm and stable, with slopes no steeper than 2%. Overlooks with native soil surfacing must be graded, compacted, and free of obstructions.
- Access trails to the overlooks should match the standard trail specifications listed in Section 2.
- Any disturbed areas around the overlooks will be revegetated as needed with USFWS-approved nursery stock.
- One interpretive display will be added to the overlooks based on the interpretive design described in Section 5.5.

### **4.1 Peterson Reservoir Overlook**

The proposed Peterson Reservoir Overlook is located to the north of Peterson Reservoir and at the junction of the Peterson Reservoir Trail and the Cold Spring Trail. The overlook utilizes an existing earthen mound, with approximately 12,020 square feet (SF) on top.

Access to the top of the overlook will take advantage of an existing depression on the north side of the earthen mound. This depression will be graded to ensure proper travel slopes and cross-sloped for drainage compliant with the standard trail specifications provided in Section 2.

### **4.2 Rogers Spring Overlook**

The proposed Rogers Spring Overlook (Sheet S12, Appendix A) will provide views of Rogers Spring for UCS visitors while protecting the surrounding vegetation and integrity of the spring.

Access and parking to the new overlook will be from the improved Rogers Spring Parking Area (Section 3.2).

The overlook area will be located immediately adjacent to the UCS Loop trailhead. The overlook will be a constructed boardwalk matching the design found at Longstreet Spring. This includes a low-profile walking boardwalk path and viewing area contained by metal railing with wood caps.

The boardwalk and viewing area will be located on the east side of Rogers Spring. Access around the north and western side of the spring will be restricted due to rare plants located around the spring. Additional vegetation plantings may be used to restrict visitor access in the Rogers Spring area.

### **4.3 Roadside Overlook**

The proposed Roadside Overlook (Sheet S11, Appendix A) is located on an existing earthen mound along the western edge of S. Longstreet Road in between Rogers Spring and Longstreet Spring and will be connected to the Roadside Overlook Parking Area (Section 3.4).

Walking access to the top of the overlook will be provided by a short trail section compliant with the standard trail specifications provided in Section 2.

## **Section 5 Interpretive Design**

The UCS trail system interpretive design boasts unique wayfinding signs and interpretive exhibit plans that will enhance visitor experience, create meaningful connections to the area, and provide for resource protection (USFWS 2022). The intent of this design was to develop a narrative storyline that exposes visitors to themes that help interpret the cultural and ecological significance of the area while maintaining aesthetic consistency with the other interpretive elements already provided on the refuge. The full interpretive design report is included as Appendix D.

The interpretive exhibit plan is separated into four primary sign groups:

1. Trailhead Information signs – communicates trail and refuge information.
  - a. One information sign installed at each design parking area, except at the Roadside Overlook. The location of the trailhead information sign for the Rogers-Longstreet Loop Trail will be either at the trailhead or the existing Longstreet Parking Area and will be determined in the next design-build phase.
2. Wayfinding signs – assists visitors with navigation around the trail system at trail junctions.
3. Interpretive Overlook Displays – larger exhibits mounted at each overlook that provide detailed interpretive story elements.
4. Mile, Direction, and Regulatory Markers – optional signage recommended to promote safety for visitors and protection of UCS habitat. The inclusion of these sign types will be determined at the discretion of USFWS and administered as necessary in the future.
  - a. Mile markers installed every 0.5 miles.
  - b. Directional markers installed strategically where extra navigational aids are needed for visitors to safely hike the trails.



- c. Regulatory markers installed in areas where sensitive habitat areas are near the hiking trails. Example sign messaging could be “stay on trails” to remind hikers of appropriate trail etiquette.

These signs not only help visitors navigate the remote location, but also provide a rich learning experience about the landscape's past, present, and future.

The primary sign panel material, an industry-standard color high-pressure laminate, is a fusion of high-resolution printed graphics with phenolic resin and kraft paper. This innovative process results in a single, solidified panel.

The sign panels are housed in decorative Corten steel frames and mounting systems, incorporating design elements and approaches detailed in the interpretive signage design report (Otak 2024). The decorative metal work, including laser-cut panels and text, is in line with the design concepts.

The colors and patterns draw inspiration from the earth tones of the desert and mountains, the blues and greens of the springs and sky, and the natural colors and patterns of the local vegetation. Traditional weaving patterns, mosaics, and beadwork colors may also influence the color pallet and sign materials.

The sign frames are securely installed in concrete footings designed to support the structural loads of the sign systems.

More detailed schematic designs of the sign concepts are provided on Sheets D7-D10 in Appendix A.

## **5.1 Trailhead Information signs**

Up to 4 trailhead information signs will be installed at the improved parking areas or trailheads of the UCS trail system. Design concepts are provided on Sheet D7 in Appendix A.

The trailhead information signs feature a trail map to help orient visitors to the UCS trail system and aid with wayfinding and route planning. The trailhead information sign will also display essential trail rules, user safety, and visitor information and may include optional interpretive details, including quotations, interpretive graphics and narratives, and custom artwork.

The trailhead information sign concept includes a sign panel of 6 SF. The signs also include a concrete foundation support system. The information sign is constructed of Corten steel, laser-cut steel, and laminate sign panels. The trailhead information sign has a multi-sided option with multiple panels organized around a central axis.

## **5.2 Wayfinding Signs**

Wayfinding sign concepts shown on Sheet D9 in Appendix A are intended to be navigational aids for trail users. Three total wayfinding signs will be installed at trail junctions. The layout and design will determine the final location of wayfinding signs.

Wayfinding signs will be installed at trail junctions to indicate trail route names. The wayfinding sign concepts are constructed of Corten steel H-beams fabricated to include a laminate sign panel or map, trail names, and informational text. Text can also be laser cut or created with cast steel lettering. The wayfinding signs would be installed on a concrete or gravel footing.

Lower profile waypoint signs are an option as well and could be designed similar to the marker sign design shown on Sheet D10 in Appendix A.

### **5.3 Mile, Directional, and Regulatory Markers**

Mile, directional, and regulatory marker sign concepts are shown on Sheet D10 in Appendix A. The concepts include a Corten steel H-beam post fabricated to include desired trail information and decorative ornamentation. The markers would be installed on a concrete or gravel footing.

Optionally, a lower profile marker could be used as well, such as the natural stone concept presented alongside the other marker design. The natural stone could be engraved with pictures, words, or other symbols to create a unique presentation for providing trail information to visitors.

Mile marker signs would be installed at half-mile intervals along the trails. Directional and regulatory markers would be installed wherever needed to provide more navigational aid to users and help protect UCS habitats by using messaging such as “stay on trails”. These signs would be designed and administered as necessary by USFWS in the future.

### **5.4 Interpretive Overlook Displays**

The development of the UCS trail system includes the creation of three new overlooks. These overlooks serve as destinations for visitors, offering a unique perspective of the UCS and hosting interpretive signs and other landmark features. Each overlook is designed with specific elements, including a flattened gathering location in the landscape, railing or tufa rock edging to designate the overlook area and direct the viewers’ perspective, and optional trail amenities like seating.

The planned locations also include an overlook display (Sheet D8, Appendix A) with interpretive signs and other educational elements to provide a wealth of information. The overlook sign concepts are secured with a concrete foundation support and constructed of Corten steel frames, laser cut steel, and laminate sign panels. The sign includes a 5 SF laminate sign panel.

## **Section 6 Adaptive Management Recommendations**

The UCS Backcountry Trail Project is in a dynamic desert floodplain that experiences extreme seasonal variances in weather patterns. Hot, dry summers are countered by flashy precipitation events that can occur throughout the year and create significant amounts of surface runoff on the landscape. Additionally, much of the planned work from the proposed design will take place near sensitive habitat areas where restoration and recovery efforts are ongoing.

These conditions make it challenging to design, construct, and maintain infrastructure that can withstand the local climate and fulfill its intended purpose. Adaptive management has been discussed throughout the design process.

The following sections describe basic adaptive management strategies that could aid the project through the remainder of design, construction, and long-term operation. These ideas and recommended actions are not meant to be all encompassing, but rather starting points for the USFWS and partners to understand the outcomes of implementing a design of this scale and most efficiently deploy available resources when managing this trail network into the future.

### **6.1 Construction**

Two primary adaptive management strategies have been identified to overcome challenges encountered during construction planning and implementation.

- 1) Each trail segment is designed to be installed within a 50-foot-wide corridor. This will give the construction crews flexibility to navigate around obstacles such as saturated soils, rare plants, sensitive soil crusts, and areas of cultural significance to indigenous peoples. Such obstacles were identified at the beginning of design and were avoided to the extent practicable when determining the design trail routes. However, it is likely that similar obstacles will be encountered during construction. Allowing the construction crew to work within a recommended corridor should provide the flexibility necessary to build the trails.
- 2) Phasing the construction work will maximize constructability if resources available to the project are limited. Phasing will also allow USFWS to evaluate project components once visitors begin using them. This could lead to important lessons in visitor experience, visitor behavior on the trails, and impact on recovering habitats. These lessons could then be applied to subsequent phases of construction when the remaining parts of the design will be built.

## 6.2 Operation & Maintenance

Long-term operation and maintenance (O&M) of the trail project will be critical to ensure the longevity of the trail system and the ecological health of the UCS.

Current USFWS resources for staffing and funding are limited, so frequent, ongoing maintenance of the trail system is a concern. The A-E team used design strategies and materials that will help minimize these maintenance concerns, such as routing trails away from sensitive and/or hard-to-maintain habitats, and recommending signage material that will be relatively more durable. However, these concerns could not be entirely mitigated against, and some degree of maintenance will be required to keep the trail system functioning.

Common maintenance items include, but are not limited to:

- Decking repair of stream crossings.
- Decking repair of the Rogers Spring Overlook.
- Repair or replacement of signage.
- Repair of damaged trail sections, trail edging, and adjacent areas. Damage could be a result of several factors including scour from surface runoff and hikers going off trail around muddy sections.
- Repair of overlook areas, including potentially adding surfacing material as needed to maintain a firm and stable surface at all weather events.
- Repair of gravel parking areas.
- Vegetation removal from within the trail limits.
- Repair of the new vault toilet

## 6.3 Trail System Advertising

An important piece of this recommended adaptive management strategy is how the UCS Backcountry Trail System is advertised to interested visitors. Providing readily available information that describes the risks, expected conditions of the trail system, and expected trail use etiquette throughout the year will be critical to ensuring the safe operation of the trail network.

Extreme weather conditions are common in the area and require that all potential visitors are adequately prepared to deal with them safely. Appropriate clothing, sun protection, drinking water, etc. are just some of the essentials that visitors should be prepared to bring with them on a trip to the trail system. Additionally, alerting visitors to educate themselves on the expected weather for days of their planned visits is also important.

Due to the potentially challenging hiking conditions of the trail system, it is important for visitors to be made aware of the physical fitness and skill level required to safely navigate the trails. Muddy trail conditions will be present along some parts of the trails during the year. Visitors should be prepared not only with adequate footwear, but also aware of the challenges that may pose if they have physical limitations. Long-term sun exposure is also a primary concern and natural shade will be limited.

Since the trail system is providing visitors with greater nature exploration opportunities within sensitive habitat areas, it is important to make clear what the expectations are for trail behavior. Keeping visitors on the trail is critical for the success of the trail system. For example, visitors may be tempted to go off trail either to explore other areas of the UCS or to avoid muddy trail conditions. This will lead to increased site disturbance that will further damage habitat, inhibit restoration efforts, and create ongoing maintenance concerns. So, it is important to make visitors aware that they must always stay on the trail.

The exact method of trail system advertising is to be determined but could include both digital and physical media. Information should be available on the AMNWR website and at the visitor's center. Pamphlets could be designed and made available at the information signs located at trailheads and parking areas. Additionally, utilizing hiking and backcountry mobile apps could greatly benefit outreach efforts and the accessibility of trail information.

#### **6.4 Trail Closures**

Conditional trail closures could be a useful tool to help mitigate trail and habitat damage when adverse trail conditions are prevalent throughout the area.

Following severe weather events, trail conditions could be such that safe use can't be guaranteed when relying solely on trail advertising and visitor awareness. During these times, it may be prudent to close the trails completely to let the severe weather pass or until USFWS have had time to adequately assess trail damage and the need for repairs.

Additionally, if visitor behavior is not meeting expectations and increasing the likelihood of trail damage or damage to UCS habitat, then closures may be useful to evaluate the causes of these behaviors and implement solutions.

#### **6.5 Trail Surfacing**

Originally the A-E team looked at installing gravel surfacing along sections of trail to help mitigate the concerns of surface runoff and groundwater. However, due to cost and concerns about altering surface hydrology within the UCS, this option was not chosen in favor of using compacted native surfacing.

If certain trail sections prove to be continually problematic and challenging to keep operational with typical O&M efforts, then gravel surfacing could still be an option for spot repairs. If used, the gravel should be installed flush with the existing ground elevations and not piled to create an elevated trail surface. This won't resolve all flooding concerns, but could provide greater trail surface stability by limiting rutting and indentations caused under muddy conditions.

A more cost-effective alternative to gravel could be a mixture of bark and mulch. This material would be installed in the same fashion as the gravel, flush with ground and not in elevated mounds. The cheaper cost and weight of the bark mixture would likely make it easier for USFWS to work with, thus making frequent repairs more achievable. This option was not investigated in detail during design; however, bark mixtures are a common technique used to surface trails in a variety of environments. The long-term viability of a bark mixture for trail surfacing is unknown and some test and observation periods between applications would be advisable.

## Section 7      References

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- Natural Resource Conservation Service (NRCS), 2023. Custom Soil Resource Report for Nye County, Nevada, Southwest Part Carson Slough. June 7, 2023.
- Otak, 2024. Upper Carson Slough Backcountry Trail Project, Interpretive Experience, Guiding Principles and Signage Design. June 7, 2024.
- Otis Bay Ecological Consultants (Otis Bay), 2011a. The Upper Carson Slough Backcountry Trail Plan Final. March 9, 2011.
- Otis Bay, 2011b. ACOE Wetland Delineation of the Ash Meadows National Wildlife Refuge. July 18, 2011.
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- USFWS, 2023. Status and Recommendations: Upper Carson Slough Backcountry Trail Plan. March 2, 2023.
- USFWS, 2024. “Ash Meadows National Wildlife Refuge,” <[Ash Meadows National Wildlife Refuge | U.S. Fish & Wildlife Service \(fws.gov\)](#)>. Accessed April 2024.
- Western Regional Climate Center (WRCC), 2024a. “Climate of Nevada.” <[WRCC: Nevada Climate \(dri.edu\)](#)>, accessed April 2024.
- WRCC, 2024b. “Amargosa Farms Garey, Nevada, Period of Record of Monthly Climate Summary.” < [AMARGOSA FARMS GAREY, NEVADA - Climate Summary \(dri.edu\)](#)>, accessed April 2024.

# UPPER CARSON SLOUGH BACKCOUNTRY TRAIL PROJECT FINAL 35% DESIGN NYE COUNTY, NEVADA JUNE 2024

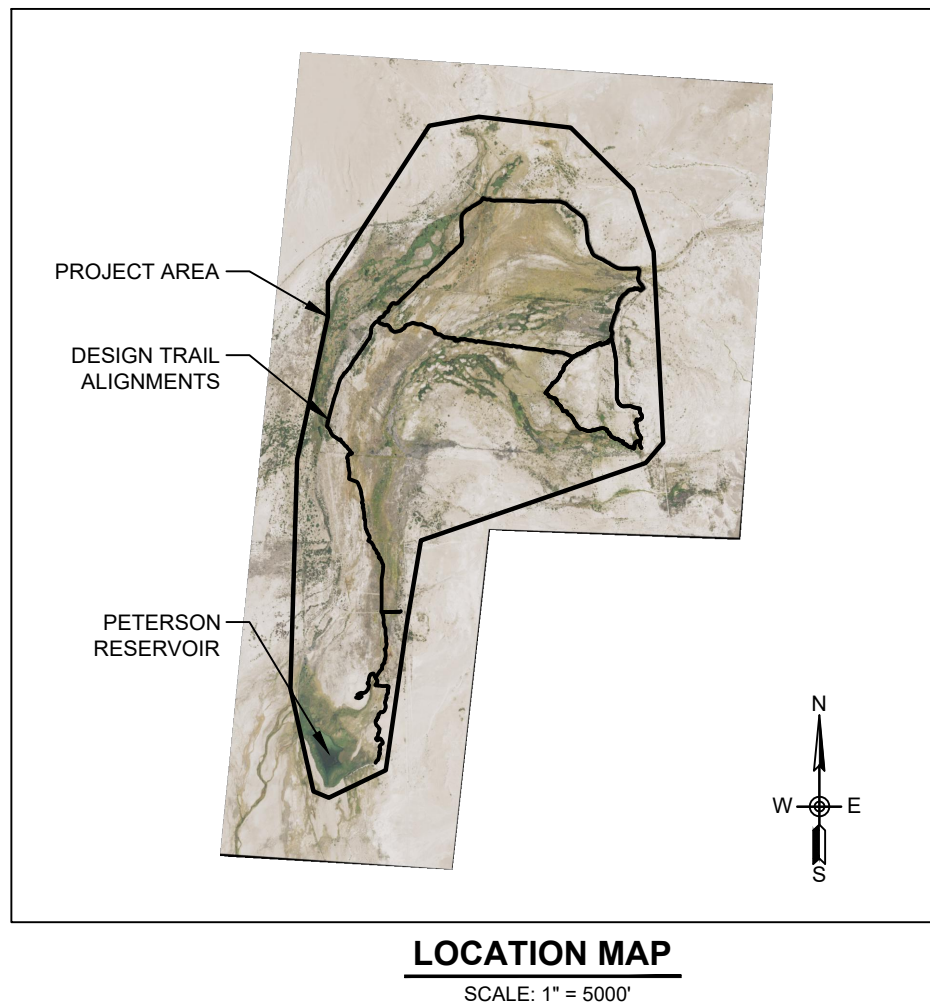
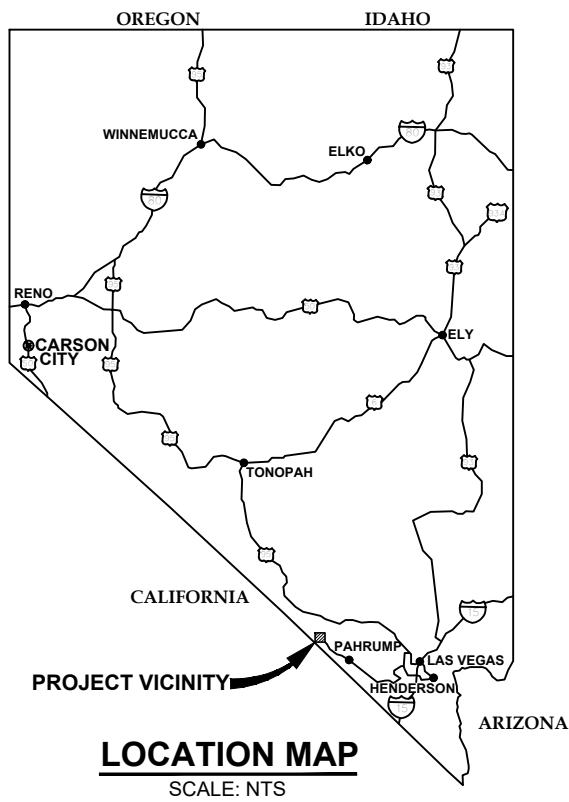
**PROJECT SPONSORS:**  
**U.S. FISH & WILDLIFE SERVICE**  
 ASH MEADOWS NATIONAL WILDLIFE REFUGE  
 610 E. SPRING MEADOWS RD.  
 AMARGOSA VALLEY, NV 89020  
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**ENGINEER:**  
**ALTA SCIENCE & ENGINEERING, INC.**  
 1220 BIG CREEK RD.  
 KELLOGG, IDAHO 83837  
 TELEPHONE: (208) 786-1206



**IN ASSOCIATION WITH:**  
**OTAK, INC.**  
 808 SW THIRD AVE., SUITE 800  
 PORTLAND OREGON 97204  
 TELEPHONE: (503) 287-6825



## COVER & GENERAL SHEETS

SHEET #	SHEET INDEX	SHEET NAME
1	COVER SHEET	CS
2 - 3	GENERAL PLAN SET INFORMATION	G1 & G2
4	SURVEY CONTROL	G3
5	OVERVIEW MAP - DESIGN TRAIL SHEET INDEX	S1
6	OVERVIEW MAP - DESIGN & OPTIONAL TRAIL ALIGNMENTS	S2
7	OVERVIEW MAP - DESIGN TRAIL TYPES	S3
8	PETERSON RESERVOIR TRAIL	S4
9	UPPER CARSON SLOUGH LOOP TRAIL	S5
10	ROGERS SPRING - LONGSTREET SPRING LOOP TRAIL	S6
11	COLD SPRING TRAIL	S7
12	PETERSON RESERVOIR PARKING AREA	S8
13	PETERSON RESERVOIR OVERLOOK	S9
14	HUNTER'S ACCESS PARKING AREA	S10
15	ROADSIDE OVERLOOK & PARKING AREA	S11
16	ROGERS SPRING OVERLOOK & PARKING AREA	S12
17	DETAILS - VAULT TOILET	D1
18	DETAILS - STREAM CROSSINGS	D2
19	DETAILS - ROGERS SPRING OVERLOOK & BOARDWALK	D3
20	DETAILS - PARKING AREAS	D4
21	DETAILS - TRAIL, OVERLOOK, & PARKING AREA EDGING	D5
22	DETAILS - TRAIL CROSS SECTION	D6
23	DETAILS - TRAILHEAD INFORMATION SIGN	D7
24	DETAILS - INTERPRETIVE OVERLOOK DISPLAYS	D8
25	DETAILS - WAYFINDING SIGNS	D9
26	DETAILS - MILE, DIRECTIONAL, & REGULATORY MARKERS	D10

SUBMITTED BY PROJECT MANAGER:
REVIEWED FOR SAFETY COMPLIANCE:
REVIEWED FOR ENVIRONMENTAL COMPLIANCE:
REVIEWED FOR ADA COMPLIANCE:
CERTIFIED 10 CFR 435 COMPLIANCE (ENERGY):
SUBMITTED BY REGIONAL ENGINEER:
PROGRAMMATIC REVIEW:

NO.	DATE	REVISIONS	BY



COORDINATE SYSTEM: NVSP CENTRAL, NAD83 (2011) US FT.	
SCALE:	AS NOTED
DRAWN BY:	C. HARTZ
ENGINEER:	J. DZARA
CHECKED BY:	T. HARJU

**UPPER CARSON SLOUGH  
BACKCOUNTRY TRAIL PROJECT**

**ASH MEADOWS NATIONAL  
WILDLIFE REFUGE  
NYE COUNTY, NEVADA**

COVER SHEET

SHEET:	CS
PRINT DATE:	6/14/2024
APPROVED DATE:	6/10/2024
PROJECT NO.:	23013
SHEET NO.:	1 OF 26

## GENERAL NOTES AND SPECIFICATIONS

1. ALL WORK SHALL BE PERFORMED BY THE DESIGN-BUILD CONTRACTOR IN ACCORDANCE WITH THE DESIGN-BUILD CONTRACT AND AS REQUIRED BY THE U.S. FISH & WILDLIFE SERVICE (USFWS) AND ALL OTHER APPLICABLE LOCAL, STATE, AND NATIONAL REQUIREMENTS, UNLESS OTHERWISE NOTED.
2. A COPY OF THE APPROVED PLANS COMPLETED UNDER THE DESIGN-BUILD CONTRACT MUST BE POSTED AT THE JOB SITE FOR PUBLIC VIEWING AT ALL TIMES DURING CONSTRUCTION.
3. THE CONTRACTOR SHALL BE FAMILIAR WITH AND COMPLY WITH ALL CONDITIONS OF THE PERMITS OBTAINED FOR THE PROJECT.
4. THE CONTRACTOR SHALL MEET OR EXCEED ALL OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) REQUIREMENTS FOR ALL WORK ASSOCIATED WITH THIS PROJECT AT ALL TIMES. IT IS THE CONTRACTOR'S RESPONSIBILITY TO BE FAMILIAR WITH AND IMPLEMENT ALL CURRENT SAFETY REQUIREMENTS AND STANDARDS.
5. THE GENERAL NOTES AND SPECIFICATIONS ADDRESSED HEREIN ARE NOT INCLUSIVE TO THIS PROJECT. THE CONTRACTOR SHALL ALSO ABIDE BY ANY PROJECT TECHNICAL SPECIFICATIONS IN THE CONTRACT DOCUMENTS (UNDER SEPARATE COVER).
6. SURVEY CONTROL POINTS ARE SHOWN ON SHEET G3. LOCATIONS AND ELEVATIONS ARE GRID COORDINATES. ALL MONUMENTS MAY NOT BE SHOWN ON THESE DRAWINGS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL EXISTING MONUMENTS AND ANY OTHER SURVEY MARKERS DURING CONSTRUCTION. ALL SUCH MONUMENTS OR MARKERS DISTURBED DURING CONSTRUCTION SHALL BE REPLACED BY A PROFESSIONAL SURVEYOR LICENSED IN THE STATE OF NEVADA AT CONTRACTOR'S EXPENSE.
7. LOCATIONS OF EXISTING SITE FEATURES ARE APPROXIMATE. CONTRACTOR SHALL FIELD-VERIFY THE EXACT LOCATION OF FEATURES AND ALL EXISTING UTILITIES BEFORE COMMENCING WORK. UNDERGROUND UTILITIES SHALL BE LOCATED AND MARKED PRIOR TO EXCAVATION. CALL THE ONE-CALL UTILITY LOCATE SERVICE AT (800) 398-3285 AT LEAST TWO (2) WORKING DAYS PRIOR TO START OF CONSTRUCTION.
8. CONTRACTOR SHALL LOCATE, PROTECT, AND IF DAMAGED DURING CONSTRUCTION, REPAIR ALL ABOVE GROUND AND BELOW GROUND UTILITIES INCLUDING GAS, ELECTRIC, SEPTIC, WATER, SANITARY, STORM, COMMUNICATION, SPRINKLERS, IRRIGATION, ETC.
9. CONTRACTOR SHALL PROTECT ADJACENT PROPERTIES AND RIGHTS-OF-WAY FROM DAMAGE AND DEBRIS DURING CONSTRUCTION.
10. CONTRACTOR SHALL NOTIFY USFWS IMMEDIATELY IF THEY DISCOVER ANY DISCREPANCIES BETWEEN THE CONSTRUCTION DOCUMENTS AND EXISTING CONDITIONS ENCOUNTERED. ALLOW (48) HOURS FOR ENGINEER TO MODIFY THE DESIGN, IF NECESSARY, UNLESS OTHERWISE SPECIFIED.
11. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL SIZING OF EQUIPMENT USED DURING THE PROJECT AND FOR WEIGHT RESTRICTIONS ON EXISTING BRIDGES AND ROADS.
12. TRAFFIC CONTROL MEETING MUTCD STANDARDS SHALL BE IMPLEMENTED BY CONTRACTOR WHEN WORKING IN OR ADJACENT TO PUBLIC RIGHTS-OF-WAY. CONTRACTOR SHALL BE FAMILIAR WITH CURRENT MUTCD STANDARDS AND HAVE THE ABILITY TO EMPLOY CERTIFIED FLAGGERS AT THE JOB SITE WHEN NEEDED. CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ADEQUATE SAFEGUARDS, SAFETY DEVICES, PROTECTIVE EQUIPMENT, FLAGGERS, AND ANY OTHER ACTIONS NEEDED TO PROTECT THE LIFE, HEALTH, AND SAFETY OF THE PUBLIC AND PROPERTY IN CONNECTION WITH THE PERFORMANCE OF WORK COVERED BY THE CONTRACT.
13. MATERIALS HANDLING: STOCKPILE ALL IMPORTED MATERIALS IN AN APPROVED LOCATION. EXCAVATED MATERIAL THAT IS POTENTIALLY CONTAMINATED SHALL BE DIRECTLY LOADED ONTO TRUCKS FOR DISPOSAL UNLESS OTHERWISE NOTED OR DIRECTED BY USFWS.
14. SUITABLE EXCAVATED MATERIAL SHALL BE RE-USED AND/OR STOCKPILED AS DIRECTED BY USFWS. UNSUITABLE EXCAVATED MATERIAL TO BE DISPOSED OF AS DIRECTED BY USFWS.
15. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LIMITING THE SPREAD OF INVASIVE SPECIES DURING CONSTRUCTION. ALL CONSTRUCTION METHODS AND DECONTAMINATION PROCEDURES USED ON SITE SHALL ADHERE TO THE REGULATIONS AND GUIDANCE ESTABLISHED FOR THE REFUGE.
16. EROSION AND SEDIMENT CONTROL IS REQUIRED AND WILL BE EMPLOYED AT ALL TIMES TO ACHIEVE BEST MANAGEMENT PRACTICES FOR STORM WATER MANAGEMENT AND SEDIMENT CONTROL, INCLUDING MATERIAL TRACKING.
17. ALL CONSTRUCTED FEATURES SHALL FOLLOW THE ARCHITECTURAL BARRIERS ACT (ABA) STANDARDS AND GUIDANCE.



NO.	DATE	REVISIONS	BY



COORDINATE SYSTEM: NVSP CENTRAL, NAD83 (2011) US FT.
SCALE: N/A
DRAWN BY: C. HARTZ
ENGINEER: J. DZARA
CHECKED BY: T. HARJU

<b>UPPER CARSON SLOUGH BACKCOUNTRY TRAIL PROJECT</b>
<b>ASH MEADOWS NATIONAL WILDLIFE REFUGE NYE COUNTY, NEVADA</b>

<b>GENERAL PLAN SET INFORMATION</b>
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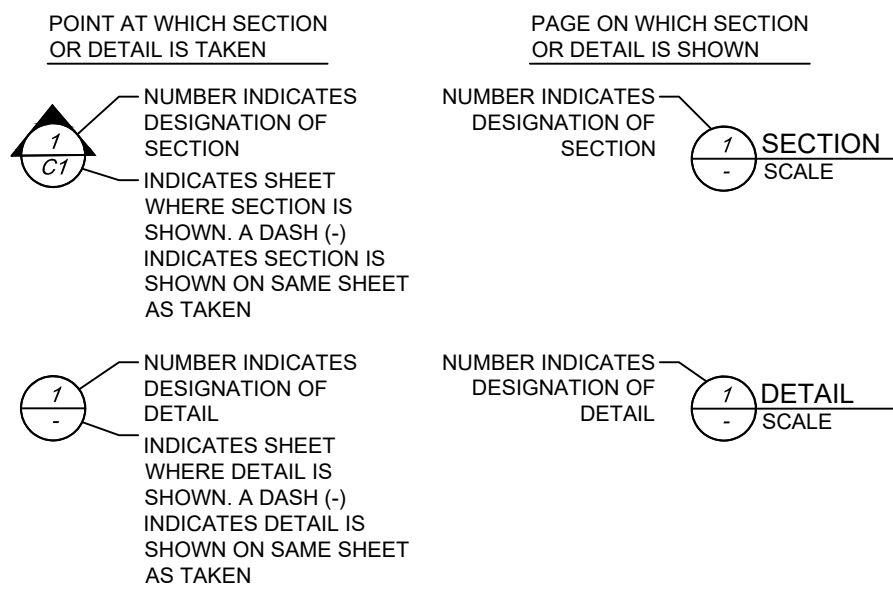
SHEET:	G1
PRINT DATE:	6/14/2024
APPROVED DATE:	6/10/2024
PROJECT NO.:	23013
SHEET NO.:	2 OF 26

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# LEGEND & SYMBOLS

DESIGN TRAIL ALIGNMENTS/CORRIDOR	
DESIGN TRAIL OPTIONAL ALIGNMENTS	
DESIGN TRAIL EXISTING BERM	
DESIGN TRAIL EXISTING ROAD	
DESIGN TRAIL EXISTING TWO TRACK PATH	
DESIGN TRAIL NEW TRAIL	
DESIGN DELINEATION EDGING	
AREAS OF CONCERN	
SHEET INDEX	
EXISTING GROUND	
EXISTING FEATURE	
DESIGN FEATURE	
DESIGN CONCRETE	
DESIGN GRAVEL SURFACING	
DESIGN TRAIL NATIVE SURFACING	
DESIGN PARKING AREAS	
DESIGN OVERLOOKS	
DESIGN STREAM CROSSINGS	
DESIGN WAYPOINT SIGNS	
DESIGN NARRATIVE INTERPRETIVE SIGNS	
DESIGN TRAILHEAD INFORMATION SIGNS	
DESIGN ACCESSIBLE PARKING SIGNS	
DESIGN BENCH	
DESIGN TRAILHEAD INFORMATION SIGN/OVERLOOK DISPLAY	
VEGETATION	
NATURAL (TUFA) ROCK	

# SECTION AND DETAIL DESIGNATION



**FINAL 35% DESIGN**  
**FOR REVIEW & DISCUSSION ONLY**

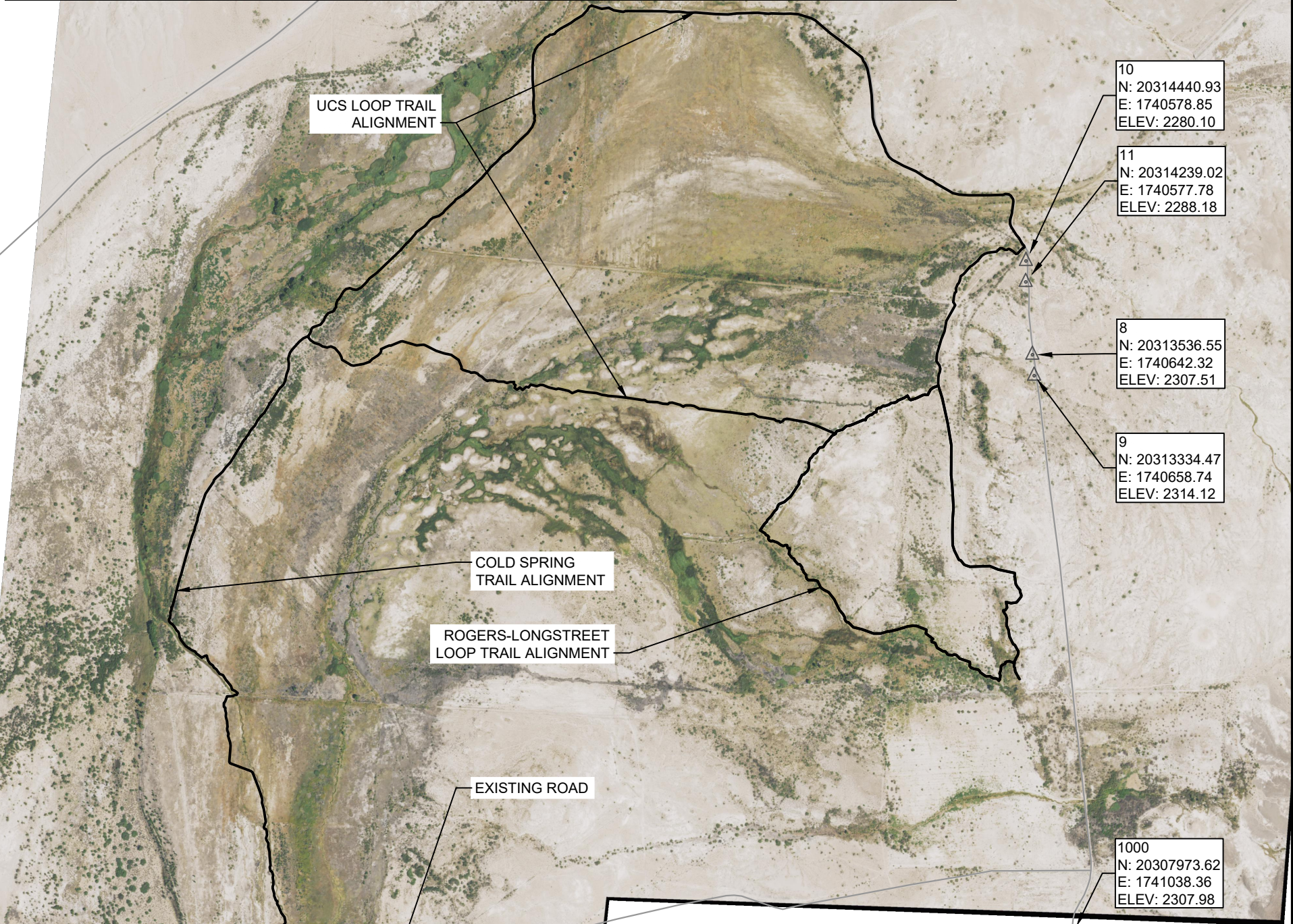
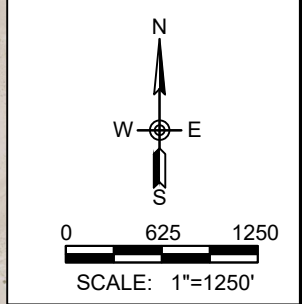
NO.	DATE	REVISIONS	BY

	COORDINATE SYSTEM: NVSP CENTRAL, NAD83 (2011) US FT.	<b>UPPER CARSON SLOUGH BACKCOUNTRY TRAIL PROJECT</b>	<b>GENERAL PLAN SET INFORMATION</b>	SHEET: G2
	SCALE: N/A			PRINT DATE: 6/14/2024
	DRAWN BY: C. HARTZ	<b>ASH MEADOWS NATIONAL WILDLIFE REFUGE NYE COUNTY, NEVADA</b>		APPROVED DATE: 6/10/2024
	ENGINEER: J. DZARA			PROJECT NO.: 23013
CHECKED BY: T. HARJU			SHEET NO.: 3 OF 26	

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SURVEY POINTS TABLE					
POINT #	POINT TYPE	NORTHING	EASTING	ELEVATION	DESCRIPTION
1	SURVEY CONTROL	23003919.70	1734376.03	2185.74	PLASTIC HUB
2	SURVEY CONTROL	20302333.56	1733806.59	2172.72	5/8" X 30" IRON ROD WITH RED PLASTIC CAP MARKED "OTAK CONTROL"
3	SURVEY CONTROL	20302513.44	1734032.14	2173.64	5/8" X 30" IRON ROD WITH RED PLASTIC CAP MARKED "OTAK CONTROL"
4	SURVEY CONTROL	20305715.86	1734367.30	2195.81	5/8" X 30" IRON ROD WITH RED PLASTIC CAP MARKED "OTAK CONTROL"
5	SURVEY CONTROL	20305960.83	1734339.90	2198.07	5/8" X 30" IRON ROD WITH RED PLASTIC CAP MARKED "OTAK CONTROL"
6	SURVEY CONTROL	20304011.04	1733315.43	2185.17	5/8" X 30" IRON ROD WITH RED PLASTIC CAP MARKED "OTAK CONTROL"
7	SURVEY CONTROL	20304315.69	1733399.81	2181.35	5/8" X 30" IRON ROD WITH RED PLASTIC CAP MARKED "OTAK CONTROL"
8	SURVEY CONTROL	20313536.55	1740642.32	2307.51	PLASTIC HUB
9	SURVEY CONTROL	20313334.47	1740658.74	2314.12	PLASTIC HUB
10	SURVEY CONTROL	20314440.93	1740578.85	2280.10	5/8" X 30" IRON ROD WITH RED PLASTIC CAP MARKED "OTAK CONTROL"
11	SURVEY CONTROL	20314239.02	1740577.78	2288.18	5/8" X 30" IRON ROD WITH RED PLASTIC CAP MARKED "OTAK CONTROL"
1000	BOUNDARY MONUMENT	20307973.62	1741038.36	2307.98	BOUNDARY MONUMENT, 3-1/2" COPPER DISK



**NOTES:**

1. SURVEY DATA IS IN GRID COORDINATES, NAD83 NV STATE PLANE CENTRAL ZONE, US SURVEY FEET.
2. ELEVATIONS ARE NAVD88 AND WERE COMPUTED USING GEOID 18A.
3. SURVEY WORK WAS PERFORMED USING TRIMBLE R10 GNSS RECEIVERS, WITH REDUNDANT MEASUREMENTS ON CONTROL POINTS AND MEETS STATE AND NATIONAL STANDARDS FOR ACCURACY, WHICH WERE PROCESSED USING THE TRIMBLE RTX KINEMATIC POST-PROCESSING SYSTEM USING NGS CONTROL POINTS "DN7451" (DESIGNATION "P619"), "DI4039" (DESIGNATION "NVPO MT. POTOSI CORS ARP"), AND "DR3059", (DESIGNATION NVAG AMARGOSAVALL CORS ARP).
4. EACH SITE HAS TWO CONTROL POINTS WHICH ARE LISTED IN THE TABLE ON THIS SHEET.
5. CONTROL POINTS NOTED AS "PLASTIC HUB" HAVE A MAGNET FOR DETECTION WITH A FERROUS METAL DETECTOR.
6. CONTOURS SHOWN AT 1 FOOT INTERVALS ON SHEETS S8-S12.
7. SURVEY WAS COMPLETED BY A PROFESSIONAL LAND SURVEYOR AT OTAK.



**FINAL 35% DESIGN**  
**FOR REVIEW & DISCUSSION ONLY**

NO.	DATE	REVISIONS	BY



COORDINATE SYSTEM:  
NVSP CENTRAL, NAD83 (2011) US FT.  
SCALE: 1" = 1250'  
DRAWN BY: C. HARTZ  
ENGINEER: J. DZARA  
CHECKED BY: T. HARJU

**UPPER CARSON SLOUGH  
BACKCOUNTRY TRAIL PROJECT**  
**ASH MEADOWS NATIONAL  
WILDLIFE REFUGE  
NYE COUNTY, NEVADA**

**SURVEY CONTROL**

SHEET: G3  
PRINT DATE: 6/14/2024  
APPROVED DATE: 6/10/2024  
PROJECT NO.: 23013  
SHEET NO.: 4 OF 26

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