Draft Environmental Assessment

Marlette Lake Dam Resilient Infrastructure Project

PDMC-PJ-09-NV-2018-001

Washoe County, Nevada

July 2024

FEMA

Federal Emergency Management Agency
Region 9
Department of Homeland Security
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Acronyms and Abbreviations

AA	action area
AADT	annual average daily traffic
AMSL	above mean sea level
APE	Area of Potential Effect
BMPs	best management practices
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CNEL	Cumulative Noise Equivalent Level
CWA	Clean Water Act
dBA	A-weighted decibels
EA	environmental assessment
EJ	environmental justice
EO	Executive Order
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FONSI	Finding of No Significant Impact
LCT	Lahontan cutthroat trout
MBTA	Migratory Bird Treaty Act
N/A	not applicable
NAAQS	National Ambient Air Quality Standards
NDEM	Nevada Division of Emergency Management
NDOT	Nevada Department of Transportation
NDOW	Nevada Department of Wildlife

NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NRCS	U.S. Natural Resources Conservation Service
NRHP	National Register of Historic Places
NWI	National Wetlands Inventory
NWP	Nationwide Permit
PDMC	Pre-Disaster Mitigation Competitive
PM	Particulate Matter
PMF	Probable Maximum Flood
RCI	Resource Concepts, Inc.
SCADA	supervisory control and data acquisition
SHPO	State Historic Preservation Office
SOI	Secretary of the Interior
SPWD	State Public Works Division
SR	State Route
TMDL	total maximum daily load
TRPA	Tahoe Regional Planning Agency
US	U.S. Route
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service

SECTION 1. Introduction

The Nevada State Public Works Division (SPWD) applied to the Federal Emergency Management Agency (FEMA) through the Nevada Division of Emergency Management for a grant through FEMA's Pre-Disaster Mitigation Competitive (PDMC) Grant Program. The Nevada Division of Emergency Management (NDEM) is the Applicant for the grant and SPWD is the Subapplicant. The PDMC grant program is authorized by Section 203 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act. FEMA's PDMC Grant Program provides funds to eligible state and local governments, federally recognized tribal governments, and nonprofit organizations to help implement long-term hazard mitigation measures before a disaster occurs.

Marlette Lake Dam in Washoe County, Nevada, is an earthen dam approximately 1 mile east of Lake Tahoe within Lake Tahoe Nevada State Park in the Lake Tahoe Basin (**Figure 1-1**). The dam is part of the Marlette Lake Water System, which provides drinking water to Carson City, Storey County, and Lyon County, Nevada. An existing gravel access road would be used to access the project site, which extends through Washoe County, Carson City, and Douglas County. The access road also serves as a portion of a hiking trail through the state park, the Flume Trail.

SPWD is proposing to stabilize Marlette Lake Dam to reduce hazards from seismic events by enlarging the downstream embankment with fill, replacing the existing corroded and leaking outlet works, and raising the crest of the dam to address freeboard deficiencies. SPWD is also proposing to replace the aging spillway, which is currently undersized and open to snow and debris that could restrict emergency flows, with a covered concrete box culvert.

This environmental assessment (EA) was prepared in accordance with the National Environmental Policy Act (NEPA) of 1969; the President's Council on Environmental Quality regulations to implement NEPA (40 Code of Federal Regulations [CFR] Parts 1500 to 1508); the U.S. Department of Homeland Security's Instruction 023-01-001; and FEMA Instruction 108-01-1, NEPA implementing procedures. FEMA is required to consider potential environmental impacts before funding or approving actions and projects. The purpose of this EA is to analyze the potential environmental impacts of the proposed project and alternatives, including a no action alternative. FEMA will use the findings in this draft EA to determine whether to prepare an environmental impact statement or to issue a finding of no significant impact (FONSI).

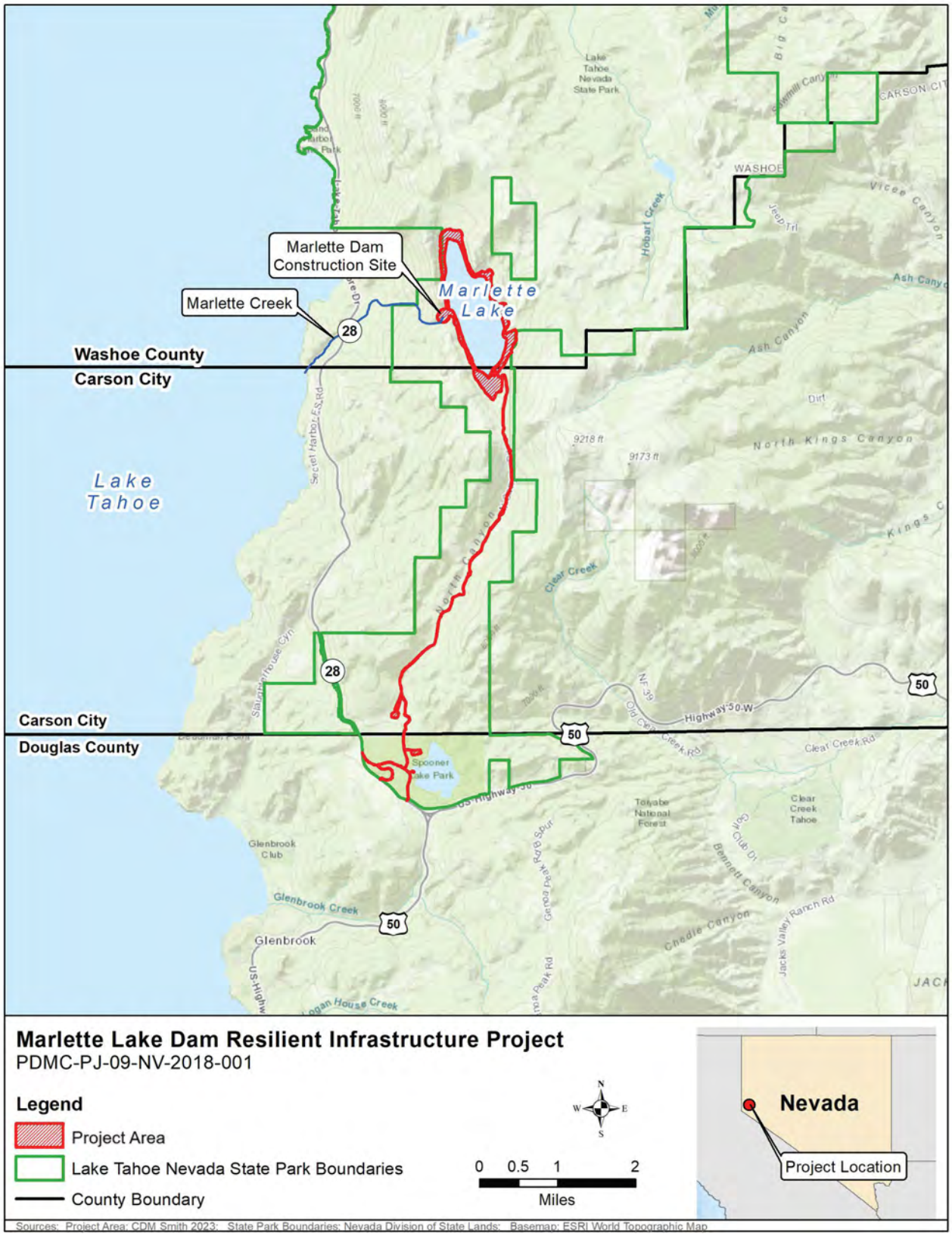


Figure 1-1. Project Vicinity

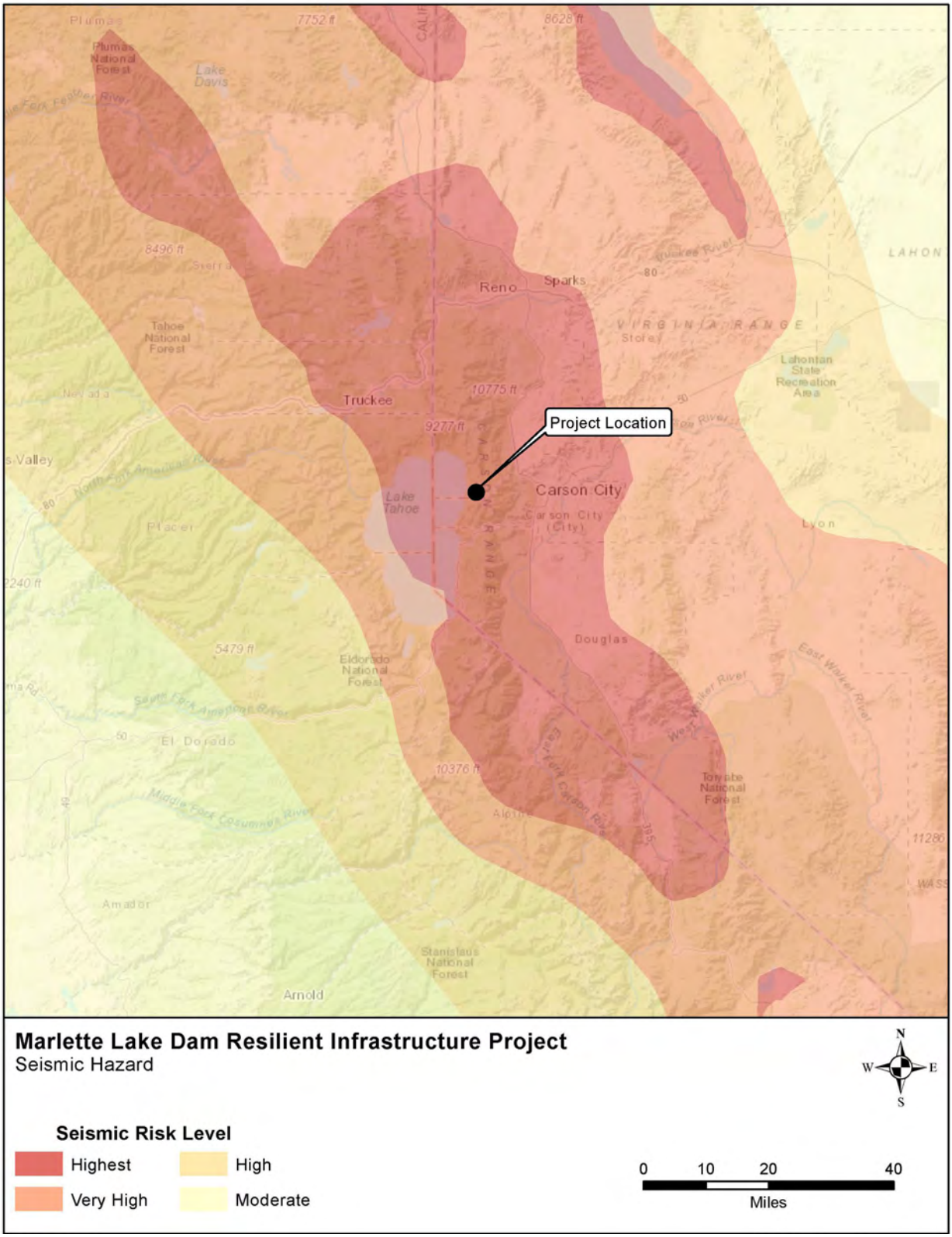
SECTION 2. Purpose and Need

The purpose of the FEMA PDMC grant program is to reduce the loss of life and property that result from natural disasters, and to enable risk mitigation measures to be implemented prior to a disaster. The purpose of the proposed action is to reduce seismic hazards that could affect the critical drinking water infrastructure of Marlette Lake Dam and downstream life, property, and infrastructure.

The Marlette Lake Dam is in an area of high seismic hazard. Annual inspections indicate a high probability of a dam breach should there be an earthquake of magnitude 6.5 or larger because of the age and condition of the dam. In addition, the existing outlet pipes are corroded and splitting, creating a path for seepage through the earthen dam structure, further compromising the integrity of the dam. The Marlette Lake Dam is classified as a "High Hazard Dam" in the National Inventory of Dams maintained by the U.S. Army Corps of Engineers (USACE). A "High Hazard" designation is assigned to dams where there is a reasonable potential for loss of life and/or extreme economic loss in the event of a dam failure (USACE 2011). A dam breach of the Marlette Lake Dam would cause substantial damage to the dam and the existing structures, roadways, and infrastructure downstream, including State Route (SR) 28 and a sewage effluent pipeline that runs beneath the road. A dam breach could jeopardize the health and safety of people downstream, while also impacting the ecology and water quality of Lake Tahoe and the delivery of water to Carson City and areas of Storey County and Lyon County.

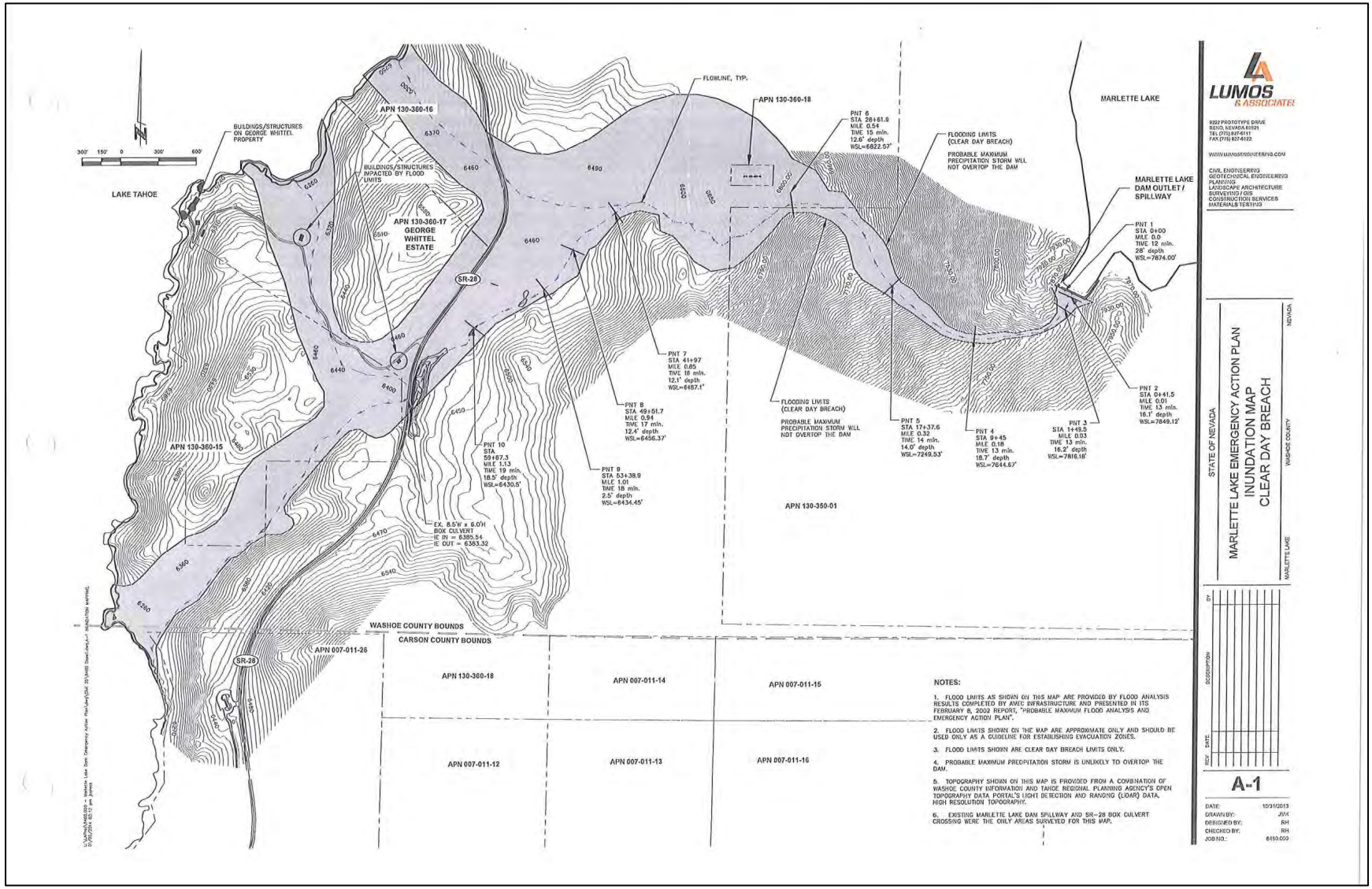
Nevada is the third most seismically active state in the United States, and Washoe County is one of the most seismically active areas within Nevada. The Washoe County Regional Hazard Mitigation Plan considers earthquake hazards to be high priority and considers the overall magnitude and potential severity of impacts of earthquakes to be high (Washoe County 2020). **Figure 2-1** depicts the overall seismic risk along the California–Nevada border near Lake Tahoe.

The dam was constructed in 1873 and was modified twice, most recently in 1959, to raise the height of the dam to the existing height of approximately 52 feet. Based on shear tests performed on the fill soils of the dam, the existing downstream face of the embankment is not stable in its current state. During a seismic event, the fill or weathered bedrock could become saturated, and sections of the dam could be damaged, subsequently leading to dam failure. **Figure 2-2** depicts the potential inundation area from a dam failure. The current height of the dam crest is also not high enough provide sufficient freeboard to contain the maximum flood pool water surface elevation, which could result in embankment overtopping during a seismic event. In addition, seepage from the leaking and corroded pipes at the downstream toe of the dam, along the primary outlets, increases the risk of dam failure. The existing spillway has deteriorated and routinely fills with snow and rocks, which, during a flood event, could result in insufficient capacity for the passage of emergency flows, subsequently leading to a dam breach. The existing outlet controls for the dam are manually operated, which are difficult to access and open during the winter months. Proper outlet control is important for safe dam operation and prevention of dam overtopping through the controlled release of water.



Source: U.S. Geological Survey 2018a

Figure 2-1. Seismic Hazard Map



Source: SPWD 2014

Figure 2-2. Marlette Lake Dam Inudation Map

SECTION 3. Alternatives

This section describes the no action alternative, the proposed action, and alternatives that were considered but dismissed.

3.1. No Action Alternative

The no action alternative is included to describe potential future conditions if no additional action is taken to stabilize Marlette Lake Dam and mitigate existing seepage through the structure. Under the no action alternative, there would be no improvements made to the dam embankment, spillway, outlet pipes, or control systems. The probability of dam failure in the event of an earthquake would not be reduced, and flooding and debris flows could close or wash out SR 28 and break the sewage effluent pipeline. Sediment, debris, and treated municipal wastewater effluent would ultimately make their way into Lake Tahoe and significantly degrade water quality. In the event of a dam breach, the delivery of water to Carson City and areas of Storey County and Lyon County would be severely affected. These municipalities would instead need to rely on the smaller components of the Marlette Lake Water System, such as the Hobart Creek Reservoir, which has a capacity of 35 million gallons compared to the Marlette Lake capacity of 3,749 million gallons (SPWD 2017).

3.2. Proposed Action

SPWD proposes to stabilize Marlette Lake Dam to reduce impacts from seismic events and address the long-term, unmitigated effects of seepage through the structure along the existing outlet pipe. The project would include several components, including installing a temporary cofferdam, dewatering the lake for construction, enlarging the dam embankment, raising the dam crest, and replacing the outlet pipes, spillway, and dam controls.

3.2.1. PROJECT FACILITIES

The Marlette Lake Dam crest is approximately 52 feet high, with an elevation of approximately 7,846 feet above mean sea level (AMSL), a length of approximately 250 feet, and a width of approximately 13 feet at the dam crest. There is one concrete-lined spillway on the west side of the dam at an elevation of approximately 7,842 feet AMSL. Two 12-inch wrought iron outlet pipes are at the deepest portion of the dam with manual controls on the crest of the dam. These pipes were upsized to 16-inch diameter steel pipes during the last upgrade to the structure, though it is unclear if the 12-inch pipes were replaced with 16-inch diameter pipes or simply connected to the larger diameter pipes. The spillway and outlets discharge to Marlette Creek, which flows under SR 28 via an existing box culvert and then west to Lake Tahoe. The Flume Trail runs southwest past the southeast end of the dam and crosses Marlette Creek over an existing bridge south of the toe of the dam. **Figure 3-1** shows the Marlette Lake Dam project area and **Figure 3-2** shows the existing Marlette Lake Dam features.

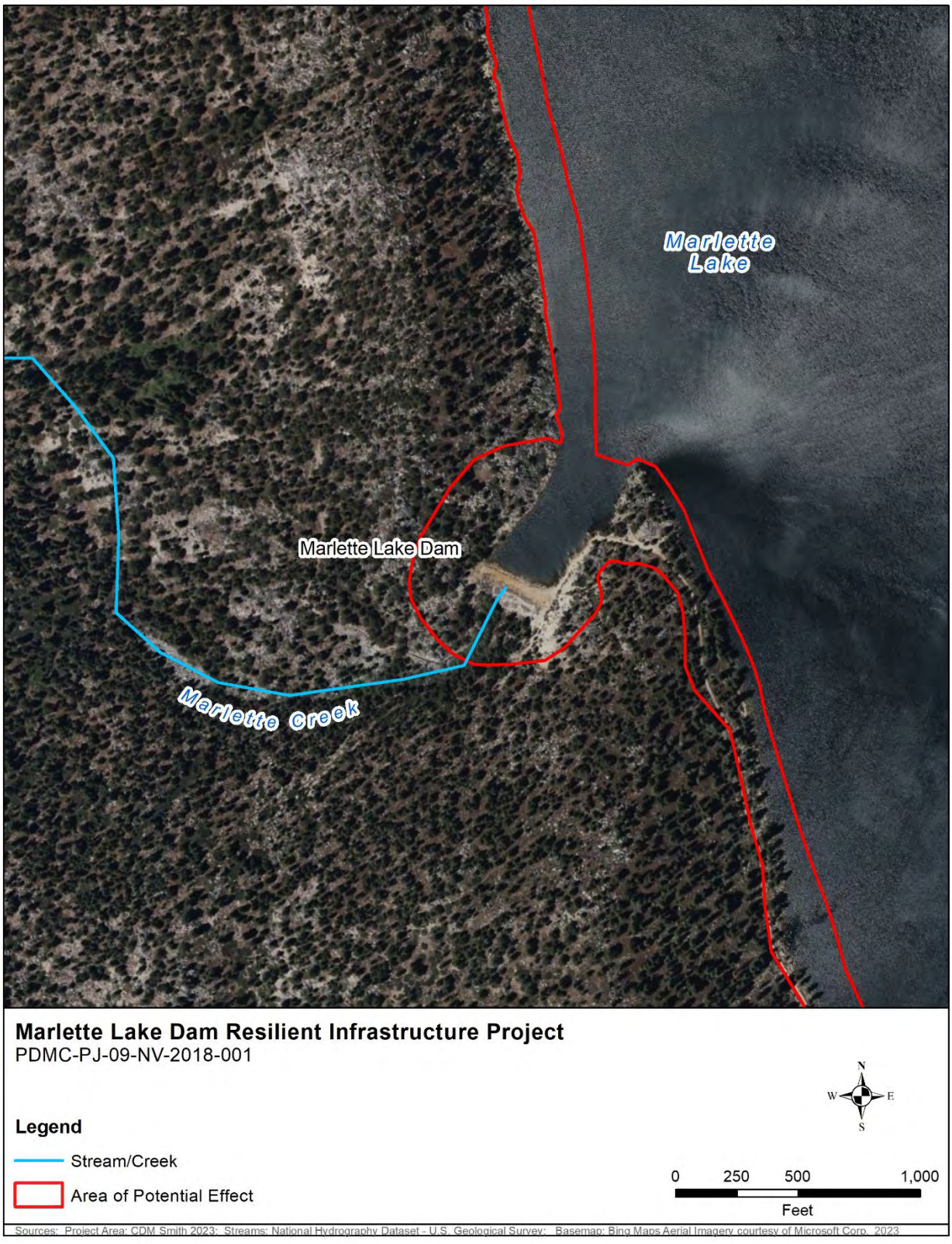


Figure 3-1. Project Area – Marlette Lake Dam

Source: Lumos & Associates 2023

Figure 3-2. Existing Project Components – Marlette Lake Dam

3.2.2. EMBANKMENT STABILIZATION

Stabilizing the dam embankment would include the removal and replacement of the existing primary outlet with a new, single 24-inch diameter pipe and placement of compacted imported soil (buttress fill) on the downstream slope. Under this effort, loose soil from the downstream face of the embankment would be removed to expose the underlying dense bedrock material, followed by placement of buttress fill to extend and flatten the downstream slope to a 3:1 slope for greater lateral support. The buttress fill would be keyed into the existing soil at the toe of the dam to mitigate slip plane failure risks. The dam height would be raised approximately 2.6 feet, to an elevation of 7,849 feet AMSL and height of approximately 55 feet, to address freeboard deficiencies. A single-stage chimney filter drain—consisting of a layer of crushed rock—would cover the downstream face of the dam prior to the placement of the buttress fill. A single-stage toe drain—a perforated pipe surrounded by a layer of crushed rock—would be constructed along the new toe of the dam under the new compacted buttress fill. A single-stage seepage filter system was selected because the existing dam embankment material consists of fine-grained material and the coarser granular filter drain material would be required to retain the existing embankment material while conveying seepage. The chimney filter drain and toe drain would collect water seeping through the earthen dam and safely convey it to the riprap stilling basin while reducing hydrostatic pressure on the dam.

The existing 16-inch steel twin-outlet pipes that are corroded and leaking would be removed and replaced with a new single 24-inch steel outlet pipe encased in concrete via open-cut excavation. The existing concrete spillway would be removed and replaced with a new, enlarged and more hydraulically efficient concrete box culvert. The design of the new spillway would help prevent the buildup of snow and debris in the spillway, thereby providing adequate emergency flow and maintaining the required freeboard of 3 feet below the dam crest under the Probable Maximum Flood (PMF) storm surcharge. The spillway would convey excess flows from the PMF, which is the flood that could be expected from the most severe combination of critical meteorologic and hydrologic conditions reasonably possible within the region. A masonry building would be constructed on the dam crest to house the new controls for the outlet pipe, which would be an automated control with a supervisory control and data acquisition (SCADA) system. **Figure 3-3** shows the dam stabilization improvements.

Source: Lumos & Associates 2023

Figure 3-3. Proposed Marlette Lake Dam Site Plan

3.2.3. PROPOSED WORK

Outlet Pipes and Outlet Control Improvements

Before starting construction on the dam, the area immediately upstream of the dam would be dewatered as described in Section 3.2.4. The existing outlet pipes would be removed and replaced with a new single larger diameter outlet pipe. On the downstream face of the dam, vegetation would be removed along the dam face, including the removal of up to 19 pine, fir, and aspen trees ranging in diameter from 12 to 32 inches. A trench would be cut using construction machinery potentially including equipment such as a bulldozer, skid steer, long reach excavator, mini excavator, and mechanical compacting equipment. The trench would be excavated by bisecting the middle of the dam, to a depth ranging from approximately 4 to 45 feet at the deepest point, to access the existing outlet pipes running through the bottom of the dam. Shoring—a temporary structure to support the trench sidewalls—may be used to protect the deepest portions of the excavation at the bottom of the trench. The adjacent area would also be benched and both sides at the top of the trench would be graded at a 1.5:1 slope to further support the dam. Once excavated, the existing 16-inch pipes would be removed and hauled off-site for disposal. In the lake, the intake for the outlets would be replaced with an elevated concrete structure to prevent siltation complete with a trash rack to prevent debris from entering the pipe. A new 24-inch steel pipe would be placed through the trench in the dam, encased in reinforced concrete, and extended to daylight at Marlette Creek. The creek would be regraded at the outlet to facilitate construction of a reinforced concrete headwall and an 837-square-foot riprap stilling basin, a channel lined with large rocks or chunks of concrete to dissipate erosive flows. The Flume Trail bridge, which crosses Marlette Creek, would either be protected in place or removed and replaced. The trench would be backfilled and recompacted following the placement of the new outlet pipes.

The primary outlet control system on the dam crest would be replaced with an automated control and SCADA system, housed in a new 10-foot by 10-foot masonry building. Two slide gate actuator drive shafts, within galvanized steel conduits, would be placed down the upstream face of the dam, connecting the new control building on the dam crest to the slide gate intakes in the lake. The new automated outlet control system would allow remote control of the intakes during the winter months when the dam can be difficult to access because of heavy snowfall. **Figure 3-4** shows the proposed operational outlet improvements.

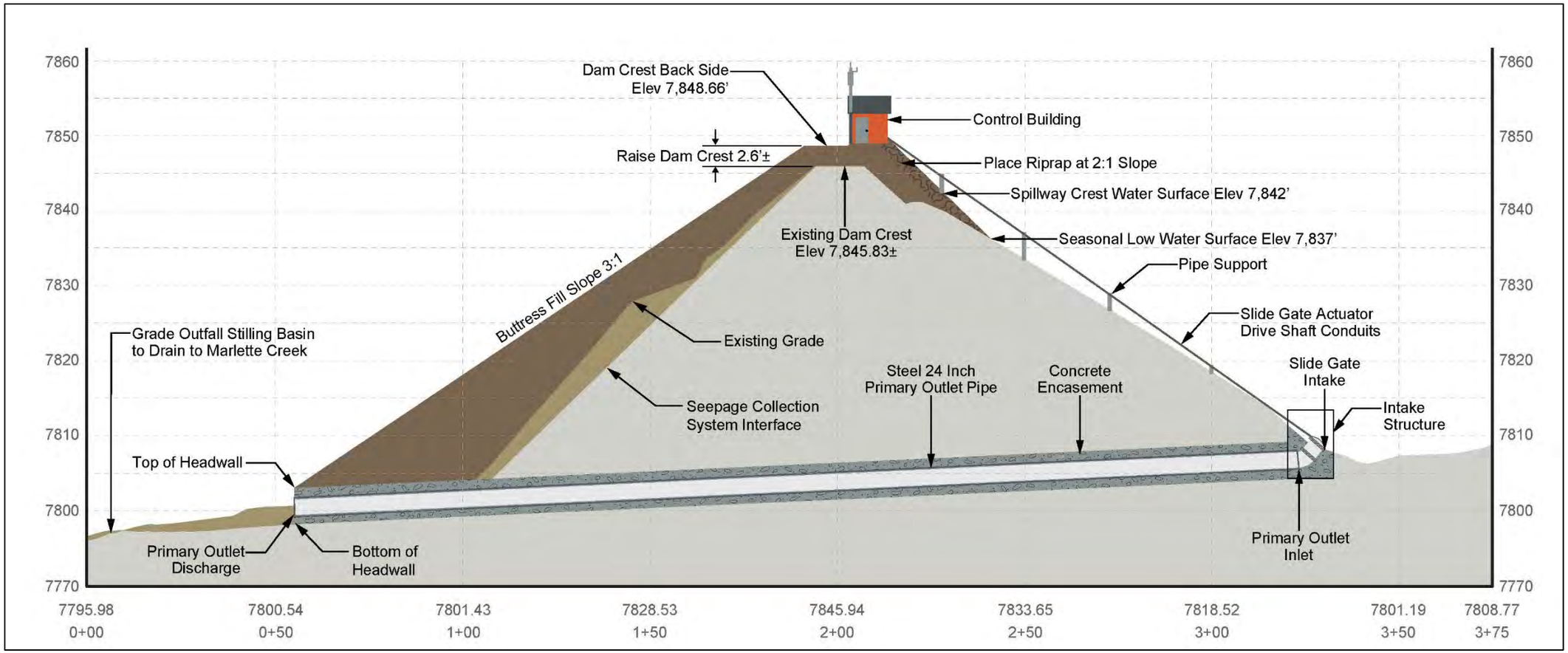


Figure 3-4. Proposed Primary Outlet

Embankment and Seepage Improvements

The existing riprap protection on the upstream face of the dam would be removed and replaced. The existing concrete spillway would be removed and replaced with a new, enlarged and hydraulically more efficient concrete box culvert that would be 11 feet wide, 6 feet tall, and 78 feet long. The base area beneath the spillway would be excavated an additional 12 inches to accommodate a compacted aggregate base to provide uniform support for the new box culvert. The spillway crest would be kept at the same elevation as the existing spillway. The covered box culvert would protect the spillway and keep it clear of snow and debris that could restrict emergency flows. The proposed dam crest height would be raised approximately 2.6 feet, to a design elevation of 7,849 feet AMSL, which would maintain the required freeboard and reduce the risk of overtopping during a seismic or PMF event.

At the downstream toe of the dam, soil and loose weathered bedrock material would be excavated and replaced with a keyed-in section of buttress fill. The downstream face of the dam would be rebuilt at a 2:1 slope following the replacement of the outlet pipes and then covered with a filter drain system and finally backfilled with the buttress fill. To manage seepage, a single-stage chimney filter drain would cover the downstream face of the dam. The chimney filter drain would consist of a 5-foot-deep layer of crushed rock placed on top of the existing sandy embankment materials. The chimney filter drain would transition into a two-stage toe drain at the toe of the dam. Perforated filter drainpipes would be placed along the bottom of the chimney filter extents and parallel to the outlet piping, along the outside of the concrete encasement. The drainpipes would be surrounded by a layer of crushed rock approximately 2.5 feet wide and 5 feet tall, adjacent to the concrete encasement. The drainpipes would collect and drain water from the chimney filter drain and would outlet at the headwall. To increase dam stability and mitigate slip plane failure potential, a foundation key would be cut to a depth of 10 feet into the toe of the dam. Following placement of the drains and excavation of the foundation key, approximately 2,860 cubic yards of compacted buttress fill would be placed and compacted in lifts on the downstream face of the dam to achieve a grade of 3:1. The fill would extend the downstream toe of the dam an additional 48 feet, covering the new outlet pipes and a portion of Marlette Creek. The installation of the drain system and placement of the compacted fill would reduce the saturation of the fill soils of the dam and improve the stability of the downstream embankment, reducing the risk of dam failure during a seismic event or failure because of uncontrolled seepage through the dam. **Figure 3-5** shows the dam embankment and seepage improvements. **Figure 3-6** shows the toe drain outlet.

Instrumentation would also be placed at the dam site and within the modified dam to monitor the reservoir water level, seepage, and deformation. A submerged ultrasonic pressure transducer would be mounted onto the intake structure of the primary outlet. Vibrating wire piezometers would be installed within the dam to monitor water pressure and horizontal inclinometers would be installed two feet deep, below the dam crest.

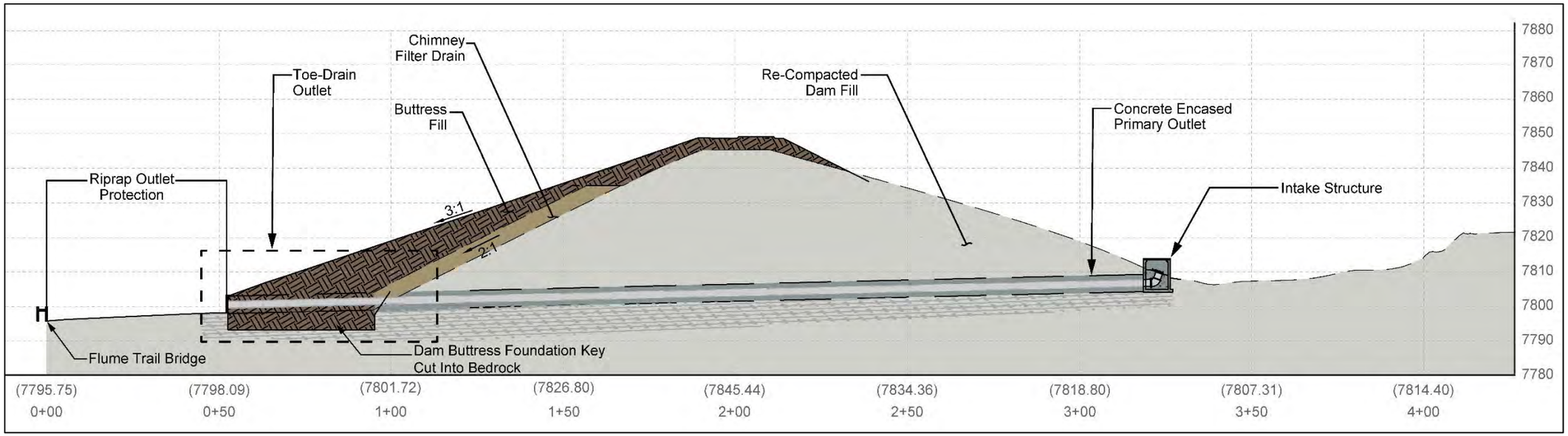


Figure 3-5. Proposed Seepage Collection System and Compacted Fill

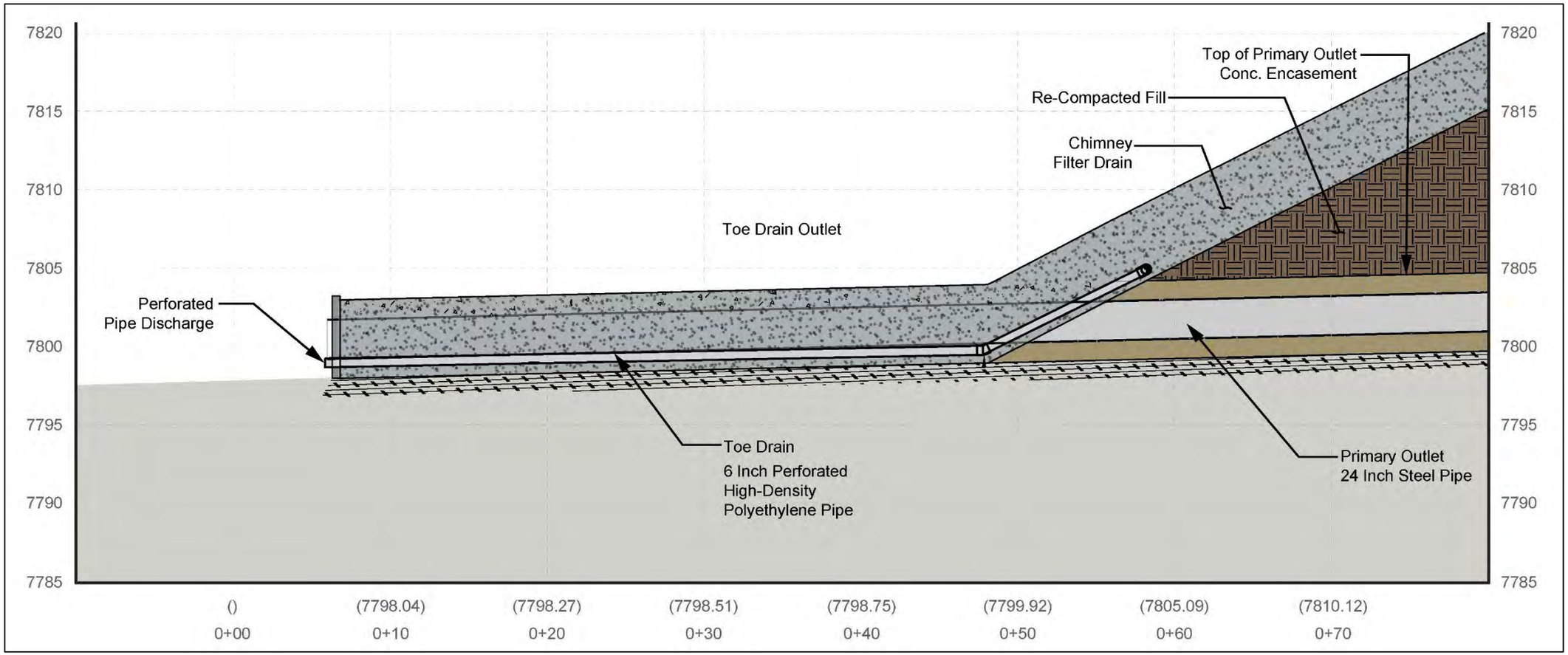


Figure 3-6. Proposed Toe Drain Outlet

3.2.4. IMPLEMENTATION METHODS

Marlette Lake Dewatering

The construction of the new intake structure and the replacement of the primary outlets would require dewatering of Marlette Lake to approximately 22 feet below the spillway crest to an elevation of approximately 7,820 feet AMSL. At 7,820 feet AMSL, the surface area of the lake would be reduced to approximately 285.0 acres from the normal pool of approximately 393.7 acres (**Figure 3-7**). The lake would be lowered using the existing primary outlet, with a proposed maximum release rate of 25 cubic feet per second. By keeping the discharge below this level, the capacity of downstream facilities would not be exceeded and water quality in the creek would be protected. This means that the water would be drained slowly out of the lake and that it may require several months to dewater the lake to the required level. A water level of 7,820 feet AMSL would expose two existing sediment bars approximately 250 feet northeast of the existing dam crest. A water-filled cofferdam would be placed in front of the furthest sediment bar to isolate the dam structure and work area at the upstream face of the dam from the rest of the lake (**Figure 3-8**). Once the cofferdam has been installed, the work area adjacent to the dam would continue to be dewatered to the lakebed, approximately 7,805 feet AMSL, using a combination of the existing primary outlet works and pumps upgradient and downgradient of the cofferdam, at which point the work area would be dry. Dewatering pumps would be used during construction to continue dewatering any seepage coming through the cofferdam that may enter the work area. Any recharge to the lake above 7,820 feet would be pumped via a bypass pipe to Marlette Creek or through the water system piping to Hobart Reservoir.

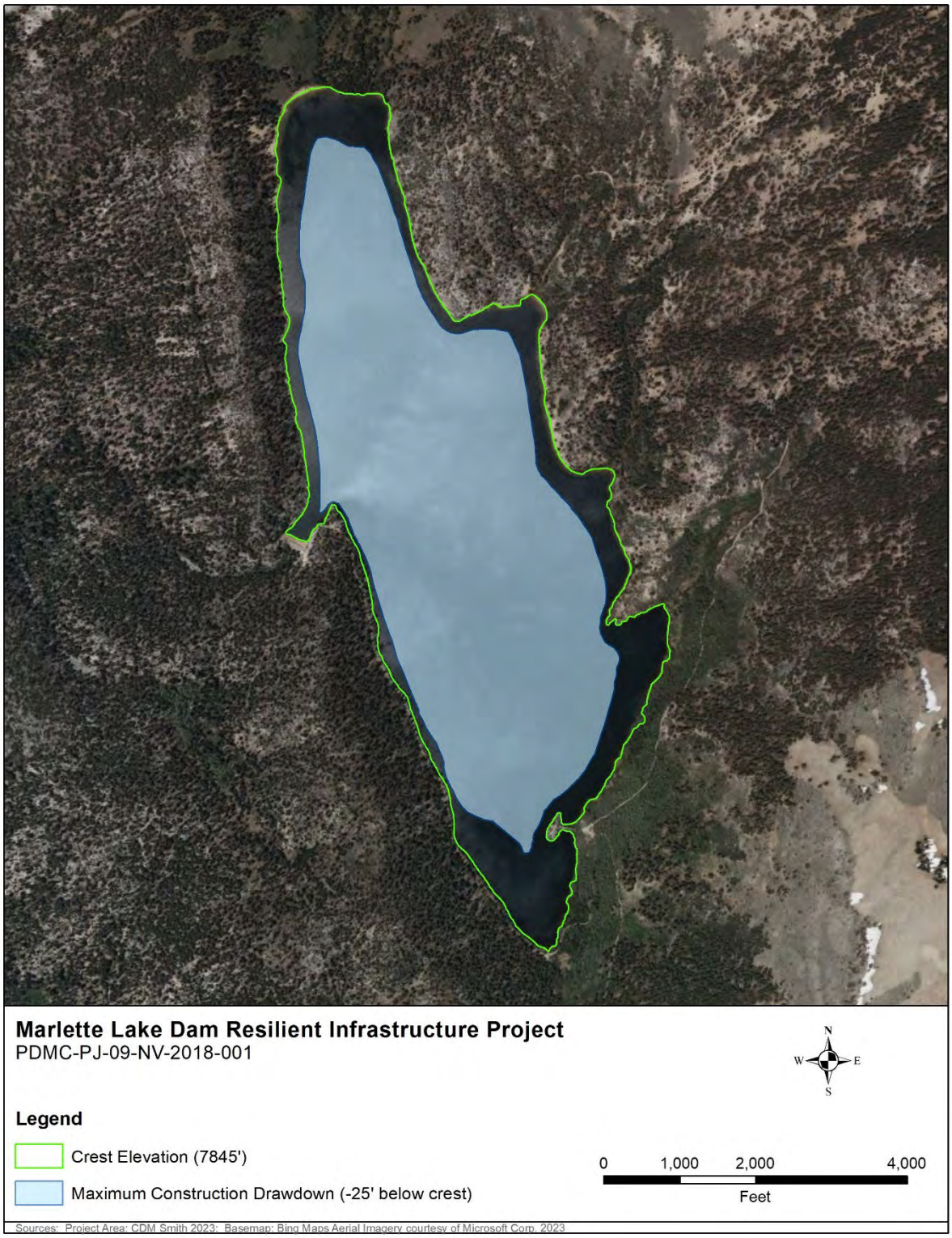


Figure 3-7. Marlette Lake Construction Drawdown Surface Area

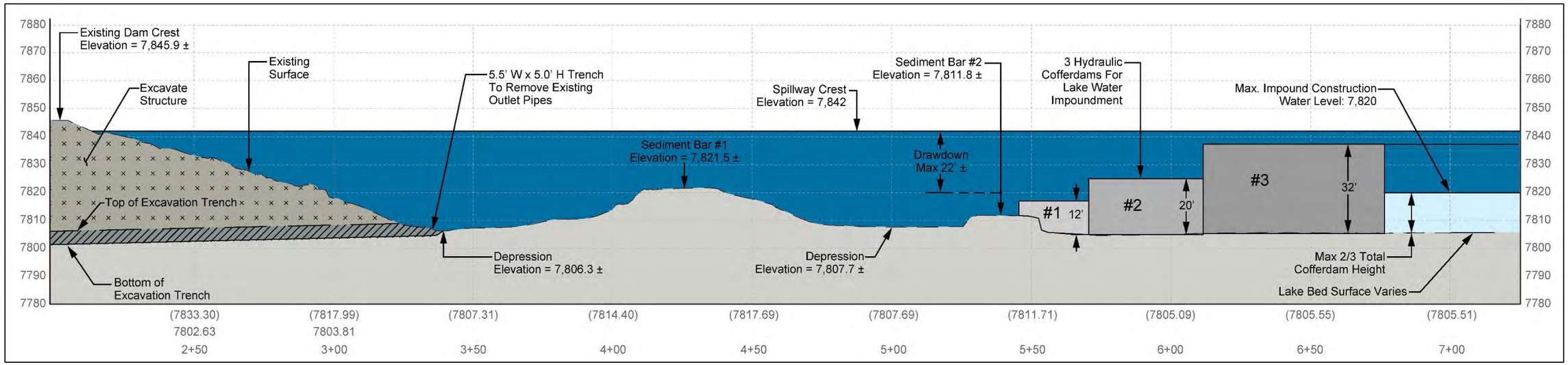


Figure 3-8. Cofferdam Placement

Cofferdam Installation and Removal

As a part of the cofferdam installation, multiple hydraulic coffer dams would be installed in series to facilitate an appropriate sealing across the forebay. Before any in-water work, turbidity curtains would be installed upgradient of the cofferdam location to minimize any potential impacts on lake water quality. No lakebed alteration is anticipated in advance of implementing the hydraulic cofferdams. Installation of the cofferdam itself would be accomplished with propeller-less waterborne crafts (e.g., jet skis) across the water, while diver crews unroll the barrier to full length and get it into position. Next, crews would fill the barrier with lake water using two 4-inch or larger trash pumps and settle the barrier into its final position as a temporary cofferdam.

The cofferdam would remain in place from approximately May through October 2025, when outlet pipe replacement and installation of the new slide gates is expected to be complete. The work area at the face of the dam would then be rewatered by methodically pumping impounded lake water to the dewatered work zone. This would be performed in a manner to avoid abrupt flows and turbidity. The water elevation needs to be level on both sides of the cofferdam to equalize the pressures before its removal. Once the cofferdam is removed, the lake would be allowed to refill naturally. The refill rate would depend on precipitation in the Marlette Lake basin and whether pumping operations of the Marlette Lake Water System are reduced during refill.

Access Roads

The existing North Canyon Road would be used to access the project site, and it runs south to north from SR 28 near Spooner Lake to the south end of Marlette Lake. North Canyon Road extends through Washoe County, Carson City, and Douglas County. At the south end of Marlette Lake, North Canyon Road transitions into the Flume Trail, a compacted dirt and gravel access road to the dam site. Use of North Canyon Road and the Flume Trail for access would require some trimming of vegetation and temporary stabilization using an aggregate base. Several pullouts along the road would be cleared and improved with minor grading. A section of the Flume Trail northeast of the dam site would be re-graded and raised approximately 5 feet using fill materials to accommodate a temporary truck turnaround. Following project construction, the road would be restored to pre-project conditions, including the repair of any damaged culvert crossings. **Figure 3-9** depicts the project site access route.

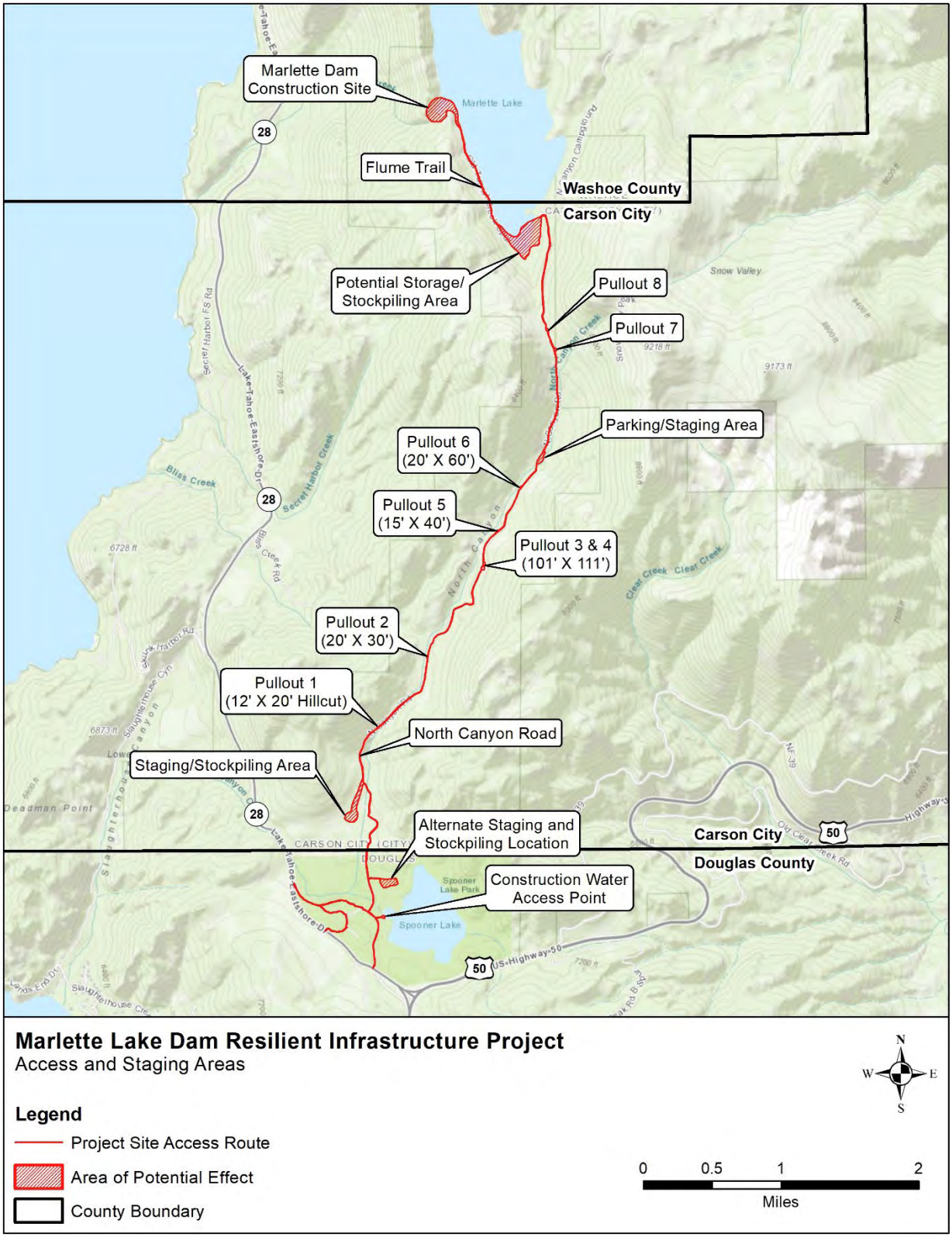


Figure 3-9. Access and Staging Areas

Construction Staging Areas and Equipment

Staging areas would be used for the storage of materials, equipment, and fuels used for the proposed action. SPWD anticipates that materials storage and equipment staging would be restricted to existing disturbed areas. The dewatered lakebed may also be used for temporary staging and material stockpiling. Areas of lakebed that would be used for temporary staging and material stockpiling would be limited to the area immediately adjacent to the dam (between the dam and the coffer dam) and an area immediately adjacent to the access road. **Figure 3-9** shows the proposed staging areas.

Table 3.1 shows the anticipated vehicles and equipment that would be required to implement the proposed action, arranged by the construction activity.

Table 3.1. Construction Equipment List

Construction Activity	Equipment Description	Quantity
Clearing and Grubbing	CAT 966 - Loader	1
	CAT 14H - Motor Grader	1
	CAT D6 - Dozer	1
	CAT 330 - Excavator	3
	Water Truck	1
Installation of Temporary Cofferdam	CAT 345 - Excavator	1
	CAT 966 - Loader	1
	Rough Terrain Crane	1
	Concrete Pump Truck	1
	Ready Mix Trucks	6
Access Road Grading	CAT 14H - Motor Grader	1
	Vibratory Compactor	1
	Bobtail Dump Trucks	6
	Water Truck	1

Construction Activity	Equipment Description	Quantity
Placement of Compacted Fill	CAT 14H - Motor Grader	1
	Vibratory Compactor (7–9 ton)	1
	CAT 966 - Loader	1
	CAT D6 - Dozer	1
	CAT 330 - Excavator	1
	10-Wheeler Dump Trucks	6
	Water Truck	1
Removal of Existing Spillway	CAT 330 - Excavator	1
	10-Wheeler Dump Trucks	2
Construction of New Outlet	Rough Terrain Crane	1
	Concrete Pump Truck	1
	Ready Mix Trucks	4
Placement of Riprap	CAT 345 - Excavator	1
	CAT 330 - Excavator	1
	CAT D6 - Dozer	1
	CAT 966 - Loader	1
	Bobtail Dump Trucks	6

Material Disposal and Fill Sources

Because the proposed project is within the Lake Tahoe Basin, all material from the demolition of existing structures, including the spillway, outlet pipes, and controls, would be removed from the project site and disposed of at an appropriate off-site location in accordance with federal and state laws. Fill used for the project would be obtained from a permitted commercial source or regularly maintained stockpile. It may be possible for excess soil material to be incorporated into the final design.

3.2.5. PROJECT DURATION

SPWD assumes that the lake drawdown process would begin in October 2024 and end in March 2025, at the latest. Major project construction would extend from May 2025 through October 2025, after which the cofferdam would be removed to allow the lake to begin to refill, and the site would be stabilized and remain inactive during the following winter. In May 2026, final construction of the mechanical control building and minor appurtenances, in addition to capping,

would be completed and the site would be restored by Summer 2026. The lake is expected to take approximately 6 years to naturally refill, depending on annual precipitation.

The construction area around the dam would be temporarily closed for the full construction period, ending Summer 2026. Alternative routes for recreation through the area would be provided.

3.2.6. AVOIDANCE AND MINIMIZATION MEASURES

Soil and Surface Water Resources

To minimize soil erosion and protect water quality, temporary best management practices (BMPs) would be installed in accordance with the *Tahoe Regional Planning Agency (TRPA) Best Management Practices Handbook*. A Stormwater Pollution Prevention Plan would also be prepared by a qualified professional and would include BMPs and respective monitoring for efficacy throughout construction until the site is stabilized. Temporary BMPs for protection of soil and water resources would include the following:

- A temporary riprap apron would be installed from the existing primary outlet discharge up to the existing spillway discharge prior to dewatering Marlette Lake to reduce flow velocities and armor the channel against erosion.
- Boundary fencing (i.e., orange construction fencing or highly visible rope fencing) would be placed and maintained to clearly identify the limits of site grading, equipment staging and material stockpiling areas, and pullouts to protect adjacent vegetation.
- Excavated soils would be temporarily stockpiled within previously disturbed, upland staging areas or immediately off-loaded into a haul truck. Sediment barriers would be placed around the downslope perimeter of temporary soil stockpiles.
- Sediment barriers would be placed around the downslope side of loose/erodible cut/fill slopes along the base of the dam embankment and at temporary road pullouts/staging areas to prevent sediment from washing into Marlette Creek and North Canyon Creek.
- Sediment barriers would be inspected weekly for damage and appropriate placement to reduce potential erosion. Any damaged barriers would be repaired, or new barriers would be installed, within 24 hours of damage identification. Accumulated sediment would be removed when it reaches a maximum of one-third the height of a silt fence or one-half the height of a fiber roll.
- Work within regulated waters would be completed under low-flow or no-flow conditions. Water levels within the lake would be lowered via the existing outlet works prior to construction. A temporary hydraulic cofferdam would then be installed within Marlette Lake, and water would be pumped around the cofferdam such that the proposed replacement of the intake structures and work on the dam can occur in a dry environment.
- A turbidity curtain would be placed upgradient of the coffer dam to prevent turbidity (caused by ground-disturbing activities) from entering the lake.

- All areas temporarily disturbed by ground-disturbing activities would be revegetated in accordance with the *TRPA Best Management Practices Handbook*.

- Staging and storage of equipment, materials, fuels, lubricants, and solvents would be more than 100 feet from aquatic resources, including wetlands, lakes, and streams. Equipment would be fueled and maintained within designated staging areas. Adequate supplies would be available at all times to handle spills, leaks, and disposal of used liquids.

- Loose construction materials, packaging, and litter would be cleaned up daily and would be disposed of or stored appropriately.

- All ground-disturbing activities would be effectively controlled via various methods to hinder fugitive dust emissions.

Biological Resources

The following BMPs would be implemented to protect biological resources:

- If vegetation removal is scheduled during the nesting season (March 1 to August 31), a focused survey for nests would be completed by a qualified wildlife biologist at a minimum radius of 500 feet for migratory birds and a 0.5-mile radius for raptors around the project area. If active nests are found, the nest would be avoided, and a disturbance buffer would be established by the project biologist in coordination with the Nevada Department of Wildlife (NDOW). The extent of the buffer would be dependent on the species, noise levels, or construction disturbance, and other topographical or artificial barriers. The buffer would be kept in place until after the nesting season or when the project biologist confirms the young have fledged.

- A screen-covered drafting box would be used while drafting or dewatering to minimize removal of aquatic species, including juvenile fish, from aquatic habitats. Pump intake screens would be sized according to the pump intake capacity and approved by an NDOW fisheries biologist.

- NDOW would perform any fish salvage procedures necessary prior to and/or during the dewatering of the waterward side of the dam.

- Tightly woven fiber netting, plastic monofilament netting, or similar material would not be used for erosion control or other purposes adjacent to aquatic resources, including wetlands.

- Vegetation removal would be minimized to the extent practicable. Where necessary within the construction access corridor and at designated passing areas, existing vegetation would be trimmed to a height necessary for construction equipment while keeping the existing plants alive. Vegetation within equipment access areas that could pose a fire danger, if left in place, would be removed.

- All construction equipment and vehicles would be washed and inspected for weed seeds and plant parts prior to bringing them onto the property. Vehicles or other traffic that may transport weed seed or plant materials would be restricted from entering the site.

- Weed-free mulch would be used for all site restoration areas.
- Infestations of invasive plants that are discovered during project implementation would be documented, locations mapped, and avoided. If invasive plants cannot be avoided during project implementation, they would be removed before they form seed heads or spread by other methods. Project implementation would be followed by monitoring for new or returning infestations after ground-disturbing activities occur. Mechanical or herbicidal controls would be applied as appropriate for the species, size of infestation, and time of year.
- To the maximum extent practicable, project-related vehicles would observe a 15-mile-per-hour speed limit within construction areas and on access roads.
- All food and food-related trash items would be enclosed in sealed trash containers and properly disposed of off-site.
- No pets would be allowed anywhere within the project area during project implementation.
- To the maximum extent practicable, construction and ground disturbance would occur only during daytime hours, and would cease no less than 30 minutes before sunset and would not begin again earlier than 30 minutes after sunrise.

In addition to the BMPs indicated above, the following species-specific measures would be incorporated into the proposed action to minimize potential impacts on Lahontan cutthroat trout (LCT, *Oncorhynchus clarkii henshawi*) (FEMA 2023a, USFWS 2023a):

- In coordination with U.S. Fish and Wildlife Service (USFWS) and NDOW, SPWD would facilitate the collection and relocation of LCT from Marlette Lake prior to reservoir drawdown. This would reduce the number of fish that would be subject to stressors associated with post-drawdown conditions. Capture and relocation activities would only be conducted by USFWS-approved biologists and support staff with knowledge and experience in handling, collecting, and relocating LCT. No collection and relocation of LCT would occur following reservoir drawdown because resultant access limitations would preclude such activities.
    - Electrofishing guidelines from USFWS would be followed during the LCT capture and relocation portion of the proposed action. The guidelines require that field crews be trained in observing animals for signs of stress and shown how to adjust electrofishing equipment to minimize that stress.
- Annual reports detailing project implementation would be provided to USFWS, including photo documentation of all aspects of the project. The annual report would briefly summarize the previous year's activities, including documentation of take of LCT.
- During dewatering and rewatering of the forebay work area, the following measures would be implemented to minimize the contribution of turbidity to Marlette Lake:

- Suspended sediment in water pumped or removed from the dewatered forebay work area would be filtered or allowed to settle before its release, or allowed to filter through vegetated upland areas prior to being returned to the lake.
- When construction is complete, the forebay area would be rewatered slowly by methodically pumping water from the lake to the dewatered work zone This would be performed in a manner that would avoid abrupt flows and turbidity. Once the water elevation is level on both sides of the cofferdam, the cofferdam would be removed.

Cultural Resources

To avoid, minimize, or mitigate adverse effects to historic properties, the following measures were identified during consultation with the Nevada State Historic Preservation Office (SHPO) and would be implemented before and during construction of the project:

- Prior to construction, adverse effects to Marlette Lake Dam and North Canyon Road would be mitigated through the implementation of the Abbreviated Consultation Process and Treatment Measures outlined in Appendix C of FEMA's Programmatic Agreement among FEMA, SHPO, and NDEM (Agreement). FEMA and SPWD would implement Appendix C Treatment Measure A.1, recordation of the Marlette Lake Dam and North Canyon Road through production of a digital photography package. The package would be prepared by a Secretary of the Interior (SOI) Qualified Architectural Historian and would meet the standards cited in the National Park Service *National Register Photo Policy Factsheet updated 5/15/2013* available at: Interim National Register Photo Policy Factsheet (nps.gov).
    - The digital photography package would contain representative overviews and close-up views of Marlette Lake Dam and its appurtenant elements, highlighting the current condition and significant features of the dam. Photographs of the northern portion of North Canyon Road—North Section would include representative views along of the length of the road focusing on the portion of the road adjacent to the dam that would be permanently elevated. Once approved by SHPO, one copy of the digital photography package would be submitted to a state or local historical society, archive, or library for permanent retention. Following the lake drawdown, additional digital photographs would be taken of exposed portions of the dam. These would be submitted as an addendum to the digital photography package and included with the permanent archive following SHPO approval.
- Prior to construction, a phased Section 106 protocol would be implemented to identify and evaluate cultural resources that may be exposed following drawdown of Marlette Lake. An SOI Qualified Archaeologist approved by SHPO would develop an Archaeological Survey Plan and lead an intensive archaeological survey along the exposed margins of Marlette Lake. The results of the archaeological survey would be summarized in a report submitted to SHPO and would include a finding of effect. If no historic properties would be adversely affected as a result of the lake drawdown, FEMA would issue a Notification of Completion of Section 106 Review for the project. If historic properties would be adversely affected, FEMA would resolve the effects in

consultation with the SHPO, NDEM, SPWD, consulting Tribes (if applicable), and Advisory Council on Historic Preservation (if participating) consistent with Stipulation II.C.6.a of the Agreement.

- During construction, a number of protective measures would be put in place to avoid adverse effects to archaeological properties.
    - An SOI Qualified Archaeologist would monitor all ground-disturbing activities associated with the project.
    - Boundary fencing (i.e., orange construction fencing or highly visible rope fencing) would be placed and maintained to clearly identify the limits of archaeological resources located within the project area. Boundary fencing also would be placed and maintained to clearly identify the limits of site grading, equipment staging, material stockpiling, and pullouts to protect adjacent areas.
    - Trimming of trees or bushes obstructing equipment movement would be limited to the greatest extent possible. If removal is unavoidable, trees or bushes should be cut flush at ground level with root balls left intact.
    - All ground-disturbing activities would be controlled using appropriate BMPs (e.g., water trucks, spraying) to hinder fugitive dust emissions.
    - If archaeological deposits are identified during project activities, all work in the vicinity of the find would cease and NDEM would notify FEMA of the finding as early as possible, but no later than 24 hours after they were notified of the discovery by the archaeologist. NDEM would take all reasonable measures to avoid or minimize harm to the property until FEMA has consulted with the SHPO and consulting Tribes (if applicable), and additional measures identified during FEMA's consultation have been implemented.
    - If human remains are discovered, SPWD would immediately notify local law enforcement, the coroner or medical examiner, and the SHPO consistent with Nevada Revised Statutes Chapters 259, 383, and 451 and would protect the remains from any harm. Discoveries of human remains on federal lands would be subject to the Native American Graves Protection and Repatriation Act (25 USC §3001-3013, 18 USC §1170) and Archaeological Resources Protection Act (16 USC §§470aa et seq), as applicable. If discovered human remains are determined to be Native American, FEMA would consult with the appropriate Tribal representatives and the SHPO and would comply with all provisions under Stipulation III.B of the Agreement. In addition, FEMA would follow the guidelines outlined in the Advisory Council on Historic Preservation's "Policy Statement on Burial Sites, Human Remains, and Funerary Objects" (2023).

Cultural resources and protective or mitigation measures are discussed further in Section 4.11, and listed in Appendix A, Agency Correspondence.

3.2.7. MAINTENANCE ACTIVITIES

Follow-up maintenance is not part of the proposed federal grant funding; however, it is a requirement of the grant award and may be considered an effect of the proposed action. SPWD would be responsible for project maintenance once the work is complete. Project maintenance would be consistent with the state's operation and maintenance manual, as well as the Marlette Lake Dam Emergency Action Plan, for the structure and would include routine dam maintenance such as access road maintenance, deep rooting vegetation control/brush and tree removal, burrowing animal control, condition observation and monitoring, dam and spillway maintenance, primary outlet control maintenance, and lake monitoring.

3.3. Additional Action Alternatives Considered and Dismissed

One alternative to the proposed Marlette Lake Dam Resilient Infrastructure Project was considered. This alternative, Dam Embankment Replacement, would require that the dam, including the original historic dam built in 1873, be removed and replaced in its current location with an entirely new embankment of similar height and features. Under this alternative, the lake, which is an important breeding pool for Lahontan cutthroat trout (LCT) and other fish, would not be able to provide suitable habitat to support the fishery for an extended period of time. In addition, initial research indicated that the Dam Embankment Replacement alternative is not a cost-effective alternative and is economically unfeasible. Therefore, this alternative was dismissed because it would not be practicable and would have greater environmental impacts than the proposed action.

SECTION 4. Affected Environment, Potential Impacts, and Mitigation

This section describes the environment potentially affected by the alternatives, evaluates potential environmental impacts, and recommends measures to avoid or reduce those impacts. When possible, quantitative information is provided to establish potential impacts. The significance of potential impacts is evaluated qualitatively based on the criteria listed in **Table 4.1**. The study area generally includes the project area and access and staging areas needed for the alternatives. If the study area for a particular resource category is different from the project area, the differences will be described in the appropriate subsection.

Table 4.1. Evaluation Criteria for Potential Impacts

Impact Scale	Criteria
None/Negligible	The resource area would not be affected, or changes or benefits would be either nondetectable or, if detected, would have effects that would be slight and local. Impacts would be well below regulatory standards, as applicable.
Minor	Changes to the resource would be measurable, although the changes would be small and localized. Impacts or benefits would be within or below regulatory standards, as applicable. Mitigation measures would reduce any potential adverse effects.
Moderate	Changes to the resource would be measurable and have either localized or regional-scale impacts/benefits. Impacts would be within or below regulatory standards, but historical conditions would be altered on a short-term basis. Mitigation measures would be necessary, and the measures would reduce any potential adverse effects.
Major	Changes would be readily measurable and would have substantial consequences on a local or regional level. Impacts would exceed regulatory standards. Mitigation measures to offset the adverse effects would be required to reduce impacts, though long-term changes to the resource would be expected.

4.1. Resources Not Affected and Not Considered Further

The resources identified in **Table 4.2** would not be affected by either the no action alternative or the proposed action because they do not exist in the project area, or the alternatives would have no effect on the resource. These resources were removed from further consideration in this EA.

Table 4.2. Resources Eliminated from Further Consideration

Resource Topic	Reason for Elimination
Farmland, Farm Soils	According to the U.S. Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS) Web Soil Survey, no soils in the project area have been designated as prime or unique farmland, or farmland of statewide importance. Therefore, there would be no impact on designated farmland soils (USDA NRCS 2024).
Wild and Scenic Rivers	According to the National Wild and Scenic River System database, Nevada does not have any designated wild and scenic rivers. The closest National Wild and Scenic River is the North Fork of the American River, which is approximately 30 miles west of the project area in Placer County, California. Thus, the alternatives would have no effect on wild and scenic rivers.
Sole Source Aquifers	According to the U.S. Environmental Protection Agency's (EPA) sole source aquifer map (EPA 2024a), there are no sole source aquifers designated in the project area; therefore, the alternatives would have no effect on sole source aquifers.
Coastal Resources	There are no coastal zones in Nevada. The project area is not located in the Coastal Zone Boundary or within a Coastal Barrier Resources System Unit (USFWS 2024).
Land Use and Zoning	This proposed action would not change existing land uses and is consistent with the current zoning. The alternatives would have no effect on land use and zoning.

4.2. Geology, Topography, and Soils

The project area is within the Carson Range of the Sierra Nevada mountains in the eastern portion of the Cascade-Sierra Mountains physiographic province. The surrounding area ranges in elevation from its peak of 8,120 feet near Snow Valley Peak and gradually slopes south to an elevation of 6,920 feet at the Spooner Lake parking area, the lowest point in the project area. The elevation at the Marlette Lake Dam is approximately 7,841 feet (Lumos & Associates 2021).

According to the USDA NRCS Web Soil Survey, the predominant soil type in the project area is colluvium, loose sediment and material that accumulates at the base of a slope, which includes Cagwin-Rock outcrop complex (37.5 percent, in the southern portion of the project area along the access road) and Temo-Witefels complex (23.7 percent, in the northern portion of the project area including the dam). All soils in the area have a low shrink-swell potential (USDA NRCS 2024). The dam fill consists, generally, of clayey sands and silty sands. The native soil/bedrock consists of loose to very dense, slightly to moderately weathered bedrock, with slightly weathered to fresh bedrock underneath. The existing topsoil layer within the dam site area is mostly loose, dry, and dusty.

As discussed in Section 2, Marlette Lake Dam is in an area of high seismic hazard. Nevada is the third most seismically active state in the United States, with Washoe County being one of the most seismically active areas within Nevada. According to the 2018 National Hazard Map prepared by the U.S. Geological Survey (2018a), the earthquake hazard for the project area is in the highest category. The East Tahoe fault runs north to south along both the east and west side of Marlette Lake, the Incline Village fault runs north to south approximately 4 miles west of Marlette Lake, and the Kings Canyon fault zone runs north to south approximately 5 miles east of Marlette Lake (U.S. Geological Survey 2018b).

4.2.1. NO ACTION ALTERNATIVE

Under the no action alternative, there would be no construction-related short-term impacts on geology, topography, or soils within the project area.

In the long term, the risk of dam failure would not be reduced. Seepage through the dam and its foundation would continue contributing to the erosion of the embankment. In the event of a dam breach, flood flows at extremely high velocities would be released, more than 30 feet per second, with a flow volume of approximately 30,000 cubic feet per second (SPWD 2014). For comparison, a flow of 25 cubic feet per second is the maximum flow volume that would avoid erosion downstream. Therefore, these flows would disturb and erode the ground, transporting a large volume of fine sediment and soil downstream, resulting in soil loss and possible minor changes in topography. This sediment would likely be carried into Lake Tahoe impacting water quality, discussed further in Section 4.5. Loss of vegetation from the dam breach, discussed further in Section 4.8, would further contribute to erosion in the inundation area. Therefore, the no action alternative could have moderate to major long-term impacts on soil and topography depending on the severity of the future erosion from seepage and damage resulting from a dam breach.

4.2.2. PROPOSED ACTION

Under the proposed action, construction of the embankment enlargement would include removal of vegetation and the excavation of loose, weathered bedrock to expose the underlying dense bedrock material, and placement of compacted fill and riprap. Approximately 1.25 acres of ground disturbance would occur at the dam site. Implementation of the proposed action would require the total excavation and replacement of approximately 16,731 cubic yards of material and approximately 6,817 cubic yards of imported fill for the placement of the compacted buttress fill and grading of the dam and access road. BMPs to control erosion and sediment runoff would be implemented, as described in Section 3.2.6, and areas disturbed during construction would be stabilized. Therefore, the proposed action would have minor, short-term adverse impacts on geology, topography, and soils from ground-disturbing activities during construction.

In the long term, the slope of the dam would be reduced, and the total dam footprint would be increased affecting the overall topography of the dam area. Erosion related to seepage through the dam foundation and the risk of dam failure would be reduced and adverse impacts on soils and topography of the area would be less likely. With a reduced risk of a dam breach, the modified dam

would help protect the soil downstream of Marlette Lake Dam from erosive flood flows. Therefore, the project would have a minor beneficial impact in the long term under this alternative.

4.3. Visual Quality and Aesthetics

The analysis of visual quality is a qualitative analysis that considers the visual context of the project area, potential for changes in character and contrast, an assessment of whether the project area includes any places or features designated for protection, the number of people who can view the site and their activities, and the extent to which those activities are related to the aesthetic qualities of the area.

The project is within the Lake Tahoe Nevada State Park, in an area closed to motorized vehicles to preserve the area's ecological and recreational resources. Therefore, while the project area is not visible from public roadways, there are two sections of trails that cross through the project area that are used for hiking and biking. The Tahoe Meadows/Mount Rose Summit to Spooner Summit section of the Tahoe Rim Trail, which runs north to south approximately 0.5 miles east of Marlette Lake, provides a scenic view of Marlette Lake Dam and Marlette Lake along with the surrounding mountains and valleys from Marlette Peak. The Flume Trail, which runs directly adjacent to the southwest edge of Marlette Lake, also includes scenic views of the dam and lake. Overall, the area around the lake and dam offers scenic vistas of undeveloped land and open water.

The Lake Tahoe - Eastshore Drive, which includes SR 28 from the California/Nevada border to the intersection with U.S. Route (US) 50, is a National Scenic Byway (Federal Highway Administration 2021). While Marlette Lake Dam and Marlette Lake are not visible from SR 28, the Lake Tahoe - Eastshore Drive offers scenic views of Lake Tahoe, forested areas, and mountains.

4.3.1. NO ACTION ALTERNATIVE

Under the no action alternative, there would be no short-term construction impacts on visual quality and aesthetics.

In the long term, the risk of dam failure would not be reduced. A dam breach would cause substantial damage to the dam itself and existing structures and improvements downstream, including SR 28 and the effluent pipeline that runs under the road. The damage to the dam and the reduction in Marlette Lake levels would impact views from the trails surrounding the lake. Damage along SR 28, a National Scenic Byway, would impact the surrounding scenery and could potentially reduce or eliminate passage along the route. In addition, with high flood flows in Marlette Creek and in the adjacent forest, a large volume of fine sediment, soil, rock, and trees, along with the dam itself, would be conveyed downstream into Lake Tahoe, impacting the water quality of the lake, which is known for its aesthetic clear blue water. Therefore, there would be potential for moderate to major adverse impacts on visual quality in the long term under this alternative depending on the severity of the damage resulting from a dam breach.

4.3.2. PROPOSED ACTION

Under the proposed action, Marlette Lake would be dewatered from an average elevation of 7,840 feet to 7,820 feet. During that time, there would be short-term minor impacts on the visual quality and aesthetics of the lake, as the water would not be at its average elevation of 7,840 feet, leaving the rim of the lake dry and exposed. Following construction, the lake would naturally be restored by snowmelt and runoff, which would take approximately 6 years. Trimming vegetation along the access road and removing 19 trees from the downstream face of the dam would have a negligible impact on the overall visual aesthetic quality of the area, which is moderately forested. The Flume Trail would be closed during construction and users of the trail would be directed around the construction area using alternate trails, thus reducing the number of people who would be directly impacted by construction activities. Signage would be placed notifying visitors of the closures and that construction would be taking place. While the project is in a remote area, the reduced water levels and construction equipment and activities would be visible by people using the Tahoe Rim Trail and the alternate trails. Therefore, decreased water levels and construction would have a minor impact on the visual quality and aesthetics of the area in the short term.

In the long term, the risk of dam failure would be reduced under this alternative and adverse impacts on aesthetics and visual quality of the area would be less likely. With a reduced risk of a dam breach, the modified dam would help preserve the scenic vistas within the project area visible from trails and SR 28. Therefore, the project would have a minor beneficial impact in the long term under this alternative.

4.4. Air Quality

The Clean Air Act, as amended, requires EPA to establish National Ambient Air Quality Standards (NAAQS) for six pollutants harmful to human and environmental health, including ozone, nitrogen dioxide, carbon monoxide, sulfur dioxide, lead, and particulate matter (PM) (including PM that is less than 10 micrometers in diameter [PM10] and fine particulate matter less than 2.5 micrometers in diameter [PM2.5]). Fugitive dust, which is considered a component of PM, can also affect air quality. Fugitive dust is released into the air by wind or human activities, such as construction, and can have human and environmental health impacts. Federally funded actions in nonattainment and maintenance areas for these pollutants are subject to conformity regulations (40 CFR Parts 51 and 93) to ensure that emissions of air pollutants from planned federally funded activities would not cause any violations of the NAAQS, increase the frequency or severity of NAAQS violations, or delay timely attainment of the NAAQS or any interim milestone. According to the EPA's Green Book (2024b), Washoe County, Carson City, and Douglas County are in attainment for all six pollutants.

4.4.1. NO ACTION ALTERNATIVE

Under the no action alternative, there would be no construction-related short-term impacts on air quality within the project area. There would be no long-term effect on air quality because there would be no new permanent air emissions source.

4.4.2. PROPOSED ACTION

Under the proposed action, the use of construction equipment and vehicles would result in the short-term release of air pollutant emissions. Emissions from off-road construction equipment, on-road construction-related vehicles, and dust-generating construction activities have the potential to affect short-term air quality. Heavy equipment and earthmoving machinery could temporarily increase the levels of some pollutants, including carbon monoxide, volatile organic compounds, nitrogen dioxide, ozone, and PM. Construction associated with the proposed action would be below "de minimis" thresholds for the General Conformity Rule, and air emissions would not increase to the extent that a general conformity analysis would be required for the proposed action. Temporary impacts on air quality would be reduced through the implementation of BMPs. Vehicles and equipment running times would be kept as short as possible and areas of exposed soil would be covered or wetted to reduce fugitive dust. All construction equipment would be required to meet current EPA emissions standards. Therefore, construction of the proposed action would have minor short-term adverse impacts on air quality within the project area.

The proposed action would include a new control building and SCADA system to operate the dam, which would be powered by solar panels and a battery pack. The remote operation of the dam and covered spillway would reduce the number of operation and maintenance related truck and helicopter trips to the dam. The proposed action would have no long-term impacts on air quality as it would not include a source of long-term permanent emissions.

4.5. Water Quality and Water Supply

The Clean Water Act (CWA) of 1977, as amended, regulates discharge of pollutants into water with sections falling under the jurisdiction of USACE and EPA. Section 404 of the CWA establishes USACE permit requirements for discharging dredged or fill materials into waters of the United States and traditional navigable waterways. Under the National Pollutant Discharge Elimination System, EPA regulates both point and nonpoint pollutant sources including stormwater and stormwater runoff. A National Pollutant Discharge Elimination System stormwater permit for construction is required to implement activities that involve 1 acre or more of ground disturbance.

An aquatic resources delineation was prepared by Resource Concepts, Inc. (RCI) for the project area in December 2021. The delineation identified Spooner Lake; Marlette Lake; five perennial streams, including North Canyon Creek and Marlette Creek; and four intermittent streams. Of the waters identified, three are listed under Section 303(d) of the CWA. The required total maximum daily load (TMDL) restoration plans for these waters that are not in attainment are under development. **Table 4.3** presents the waterbodies in the project area and their affected use and identified issues.

Table 4.3. Waterbodies in the Project Area

Water Body	Affected Use	Identified Issue
Marlette Lake - Lake Tahoe Tributaries	None (in Attainment)	None (in Attainment)
Marlette Creek - Lake Tahoe Tributaries	Aquatic Life Municipal or Domestic Supply Recreation	Cadmium Phosphorous Silver Beryllium Phosphorous
North Canyon Creek - Lake Tahoe Tributaries	Aquatic Life	Iron
Spooner Lake - Lake Tahoe Tributaries	Aquatic Life	pH Temperature Turbidity
Secret Harbor Creek - Lake Tahoe Tributaries	None (in Attainment)	None (in Attainment)
Unnamed Tributary at South End of Marlette Lake - Lake Tahoe Tributaries	Condition Unknown	Condition Unknown
Unnamed Tributary to Marlette Creek	Condition Unknown	Condition Unknown

Source: EPA 2024c

The Lake Tahoe watershed is recognized as a natural resource of special significance and Lake Tahoe is designated an "Outstanding National Resource Water" under the CWA. Between 1968 and 1997, the deep-water clarity of Lake Tahoe declined by approximately 30 percent, from 100 to 64 feet (EPA 2023). The decline in Lake Tahoe's water clarity is a result of fine sediment particles and free-floating algae fed by nitrogen and phosphorus. Because nitrogen, phosphorus, and sediment are responsible for Lake Tahoe's deep-water transparency loss, Lake Tahoe is listed under Section 303(d) of the CWA as impaired by these three pollutants. The Nevada Division of Environmental Protection, in a collaborative effort with the California Regional Water Quality Control Board, Lahontan Region, established a TMDL Program to protect water quality in the basin and restore Lake Tahoe's historic deep-water transparency (EPA 2023).

Marlette Lake is part of the Marlette Lake Water System, which provides raw water to Carson City, Storey County, and Lyon County, and the Marlette Lake Water System is the only source of raw water for Virginia City. Other smaller components of the system include Hobart Reservoir, a storage tank above Lakeview, several catchments on the East Slope of the Sierra Nevada Mountains, and an interconnected piping system (SPWD 2017). For example, the Hobart Creek Reservoir has a capacity of 35 million gallons compared to the Marlette Lake capacity of 3,749 million gallons (SPWD 2017). Originally, water was conveyed from Marlette Lake via a 4-mile-long wooden flume starting at Marlette Lake Dam and ending north at the Incline Tunnel. Following the collapse of the Incline Tunnel in 1957, a pump station was constructed on the opposite side of Marlette Lake, on the

northeastern shore across from Marlette Lake Dam, which is currently used to divert water from Marlette Lake (SPWD 2017). Water released from Marlette Lake Dam is no longer collected and is instead discharged to Marlette Creek.

4.5.1. NO ACTION ALTERNATIVE

Under the no action alternative, there would be no short-term impacts associated with construction.

In the long term, seepage through the dam and its foundation would continue contributing to the erosion of the embankment and the risk of dam failure would not be reduced. In addition to increasing the risk of dam failure, increased seepage through the dam also increases the amount of sediment washing into Marlette Creek. Increased sediment may impact the water quality of the creek, resulting in higher levels of nutrients and clouding the water, and would be carried downstream to Lake Tahoe. In the event of a dam breach, high flood flows would convey a large volume of fine sediment, soil, rock, and trees, along with the dam itself, into Lake Tahoe, impacting the water quality and clarity of the lake. A dam breach could also result in the rupture of an effluent pipe under SR 28, which could result in the discharge of treated effluent into Lake Tahoe, putting nitrogen and phosphorus into the water along with the fine sediments from the debris flow and floodwaters. The nitrogen and phosphorus could promote algal growth and the fine sediment would remain suspended in Lake Tahoe. In addition, the fine sediment on the exposed bottom of Marlette Lake would continue to be carried down the creek into Lake Tahoe every rain and snowmelt event. Water supply would also be impacted by a dam breach, as the delivery of raw water to Carson City and areas of Storey County and Lyon County would be greatly reduced. These municipalities would instead need to rely on the smaller components of the Marlette Lake Water System. Therefore, there could be moderate to major impacts on water quality and water supply in the long term under this alternative depending on the severity of the future erosion from seepage and the severity of the damage and the loss of lake storage volume resulting from a dam breach.

4.5.2. PROPOSED ACTION

The proposed action would have minor short-term impacts on water quality from construction-related activities, which could result in the discharge of pollutants and sediments into surface waters. Based on early coordination with USACE in February 2020, USACE indicated to SPWD that a Section 404 permit would likely be required for the work at the dam, as well as for any repairs of the crossings of North Canyon Creek along the access road. USACE determined that the project could qualify for a Nationwide Permit (NWP), and multiple NWPs may be used. The project would conform to the general conditions of the permits. Most of the construction-related activities would occur under dry conditions once the coffer dam is installed to isolate the dam area from lake waters. In addition, SPWD would implement a Stormwater Pollution Prevention Plan in compliance with the general stormwater permit for construction activities that would cover all project activities. Therefore, there would only be a short-term minor adverse impact on water quality from construction-related activities if all required BMPs are used.

The proposed action would involve improvements to the Marlette Lake Dam, which would require the drawdown of Marlette Lake to an elevation of approximately 7,820 feet AMSL. The drawdown would limit the ability to divert water from Marlette Lake into the Marlette Lake Water System during construction and the following 6 years while the lake naturally refills. Carson City and areas of Storey County and Lyon County would instead need to temporarily rely on alternate raw water sources, including the other components of the Marlette Lake Water System. For Virginia City, which relies entirely on the Marlette Lake Water System, sufficient water supplies would be available from Hobart Reservoir and the catchment system on the East Slope of the Sierra Nevada Mountains. Therefore, there would be a short-term moderate adverse impact on water supply from the temporary drawdown of Marlette Lake.

In the long term, the risk of dam failure would be reduced under this alternative and adverse impacts on water quality and water supply would be less likely. With reduced seepage through the dam and a reduced risk of a dam breach, the modified dam would help preserve the clarity of Marlette Creek and Lake Tahoe and protect the delivery of raw water to Carson City and areas of Storey County and Lyon County. Therefore, the project would have a moderate beneficial impact on water quality and water supply in the long term under this alternative.

4.6. Wetlands

Executive Order (EO) 11990, Protection of Wetlands, requires federal agencies to consider alternatives to work in wetlands and limits potential impacts on wetlands if there are no practicable alternatives. FEMA regulation 44 CFR Part 9, Floodplain Management and Protection of Wetlands, sets forth the policy, procedures, and responsibilities to implement and enforce EO 11990 and prohibits FEMA from funding activities in a wetland unless no practicable alternatives are available. Activities that disturb wetlands may also require a permit from USACE under Section 404 of the CWA.

An aquatic resources delineation was prepared by RCI for the project area in December 2021. Seventeen wetlands that total approximately 1.07 acres were delineated and described in the report. The survey area for the report was approximately 72 acres, including the Marlette Lake Dam, staging areas, and approximately 7 miles of access roads between Spooner Lake Park to Marlette Lake Dam (RCI 2021a). **Table 4.4** and **Figure 4-1**, **Figure 4-2**, **Figure 4-3**, **Figure 4-4**, **Figure 4-5**, **Figure 4-6**, and **Figure 4-7** present the wetland results of the aquatic resources delineation within the survey area.

The 2021 aquatic resources delineation did not include wetlands around Marlette Lake that could be impacted by lake drawdown associated with the proposed action. According to the USFWS National Wetlands Inventory (NWI) there are approximately 6,595 linear feet of wetlands that abut the Marlette Lake shoreline (**Figure 4-8)** (USFWS 2023b). A review of aerial imagery, topographic maps, and bathymetric maps indicates that the NWI map likely has overestimated the wetland resources around Marlette Lake. Several areas that are classified as wetlands on the NWI have very steep topography, are devoid of vegetation, and appear to have rocky substrates, none of which generally support wetlands. Therefore, it is unlikely that the proposed project area supports a large area of wetlands; however, the potential for wetlands around Marlette Lake remains.

Table 4.4. Delineated Wetlands within the Proposed Project Area (excluding Marlette Lake)

Wetland Type	Size (acres)
Palustrine Emergent Permanently Saturated Wetland	0.51
Palustrine Emergent Saturated Wetland	0.11
Palustrine Emergent, Seasonally Saturated Wetland	0.02
Palustrine Emergent/Scrub-Shrub, Deciduous Permanently Saturated Wetland	0.02
Palustrine Emergent/Scrub-Shrub, Deciduous, Seasonally Saturated Wetland	0.06
Palustrine Scrub-Shrub, Deciduous Permanently Saturated Wetland	0.34
Total:	**1.07**

Source: RCI 2021a

4.6.1. NO ACTION ALTERNATIVE

Under the no action alternative, there would be no short-term construction-related impacts on wetlands in the project area.

In the long term, the risk of dam failure would not be reduced. As discussed in Section 4.3.1, in the event of a dam breach, high flood flows in Marlette Creek would convey a large volume of fine sediment, soil, rock, and trees, along with the dam itself, into streamside wetlands and wetlands associated with Lake Tahoe. In addition, the debris flows could also release sewer effluent into streamside wetlands and wetlands associated with Lake Tahoe. The introduction of sediment and effluent into wetlands could alter both the water quality and ecological communities of the receiving wetland. According to Hamdhani et al. (2020), impacts associated with water quality near effluent outfalls include decreased dissolved oxygen levels, increased water temperatures, and nutrients. Therefore, if the dam were to fail, the no action alternative could have minor to moderate adverse effects on wetlands along Marlette Creek and around Lake Tahoe depending on the severity of the damage resulting from a dam breach.

Figure 4-1. Marlette Lake Dam – Aquatic Resource Delineation Map

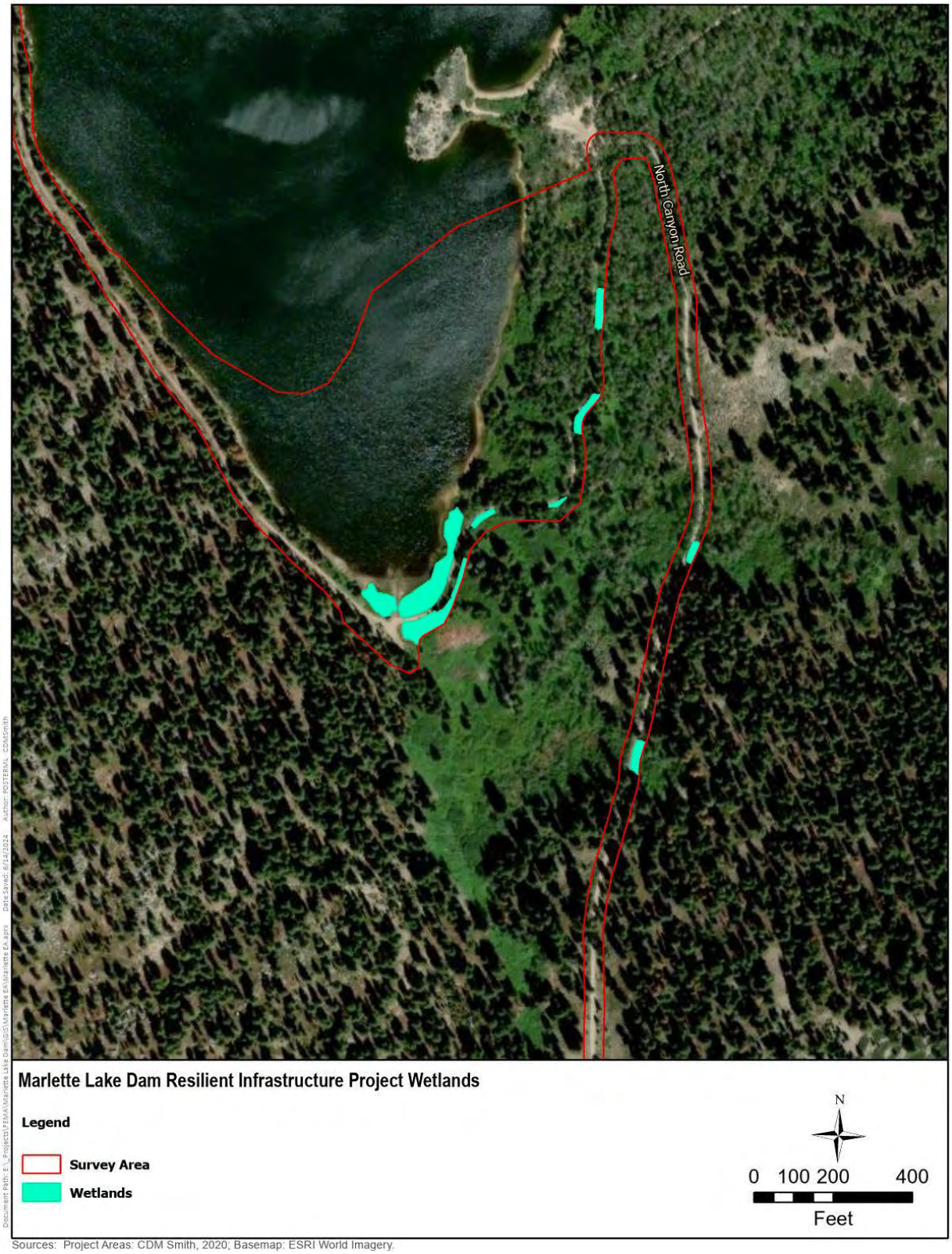


Figure 4-2. Marlette Lake and North Canyon Road – Aquatic Resource Delineation Map

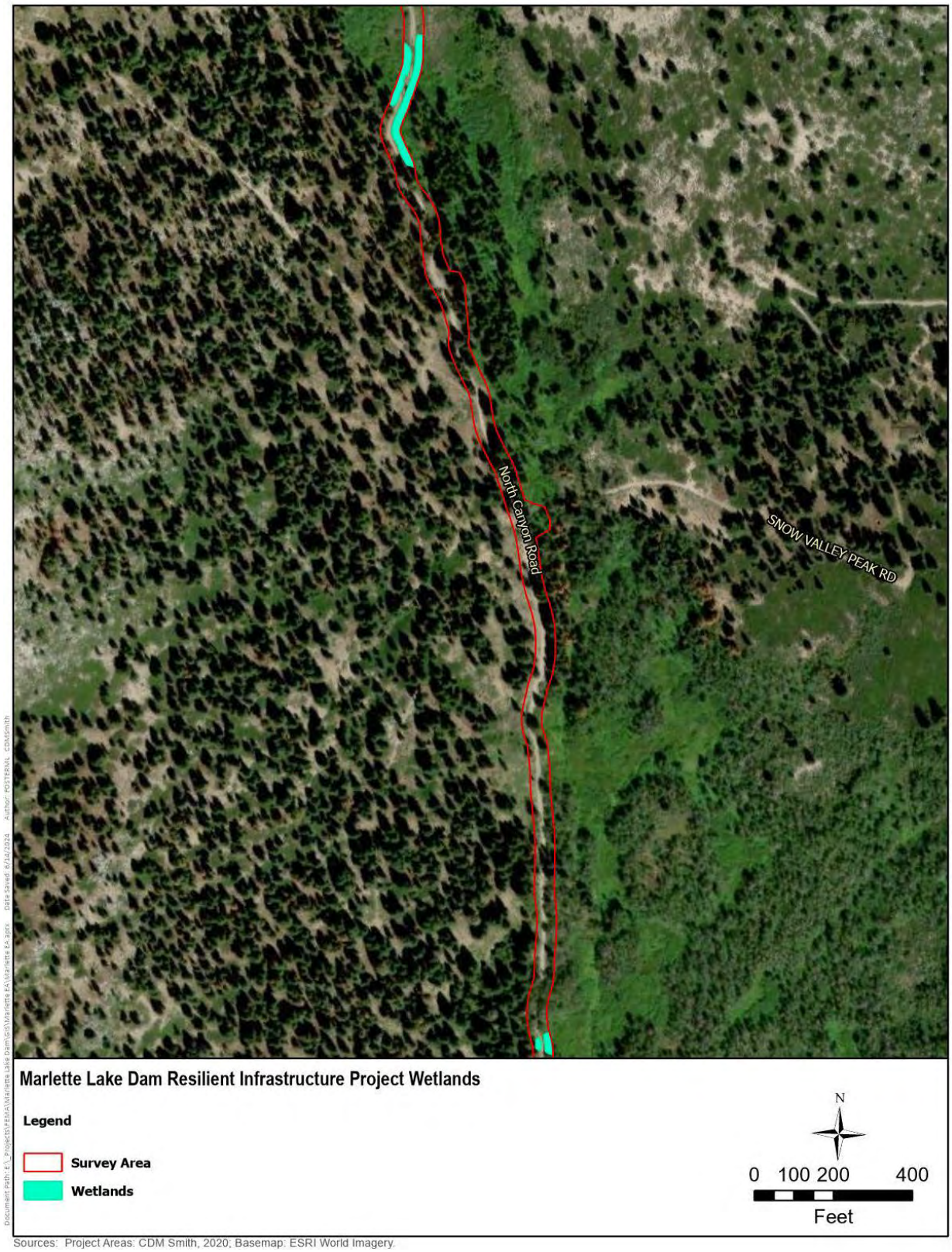


Figure 4-3. North Canyon Road (1 of 5) – Aquatic Resource Delineation Map

Figure 4-4. North Canyon Road (2 of 5) – Aquatic Resource Delineation Map

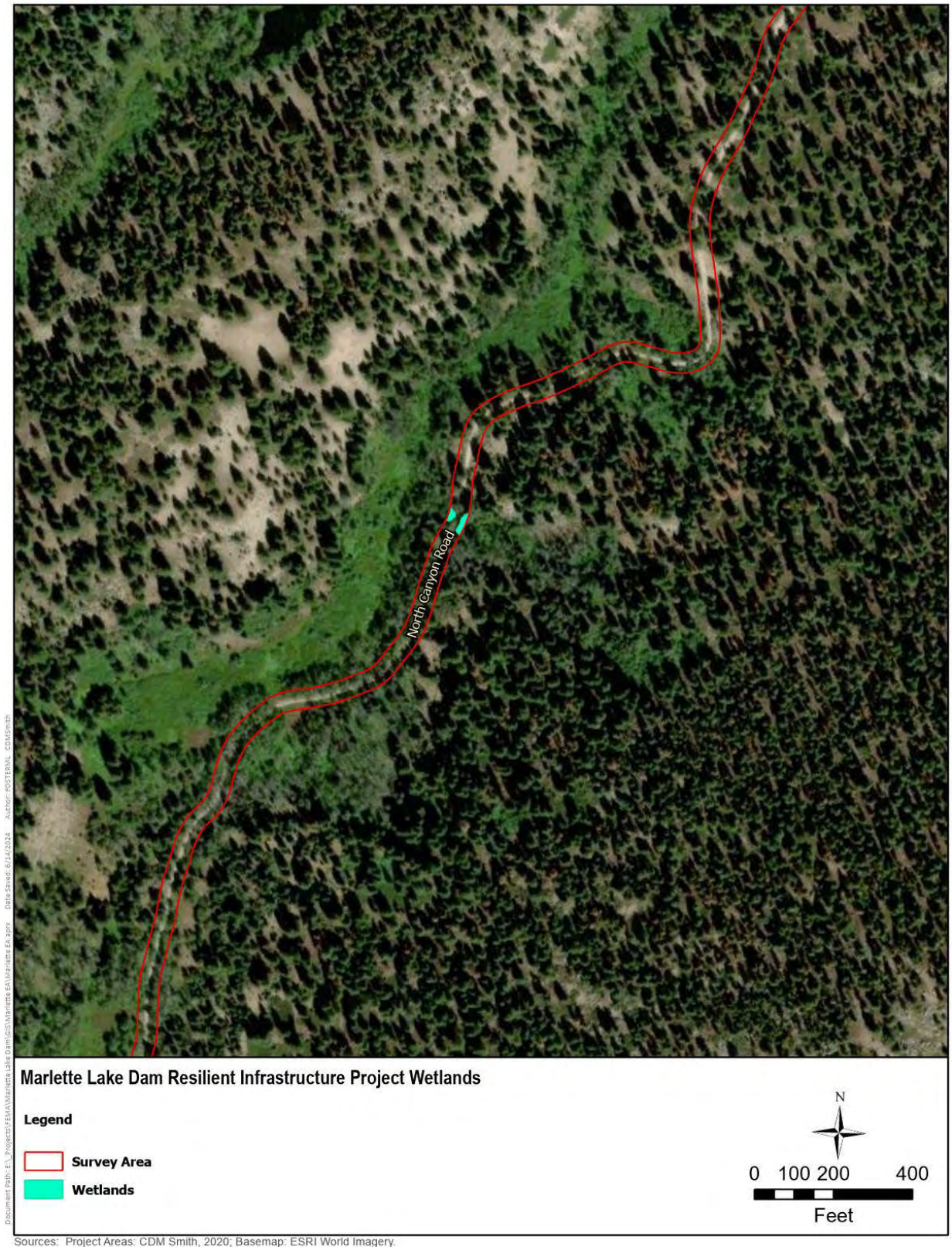


Figure 4-5. North Canyon Road (3 of 5) – Aquatic Resource Delineation Map

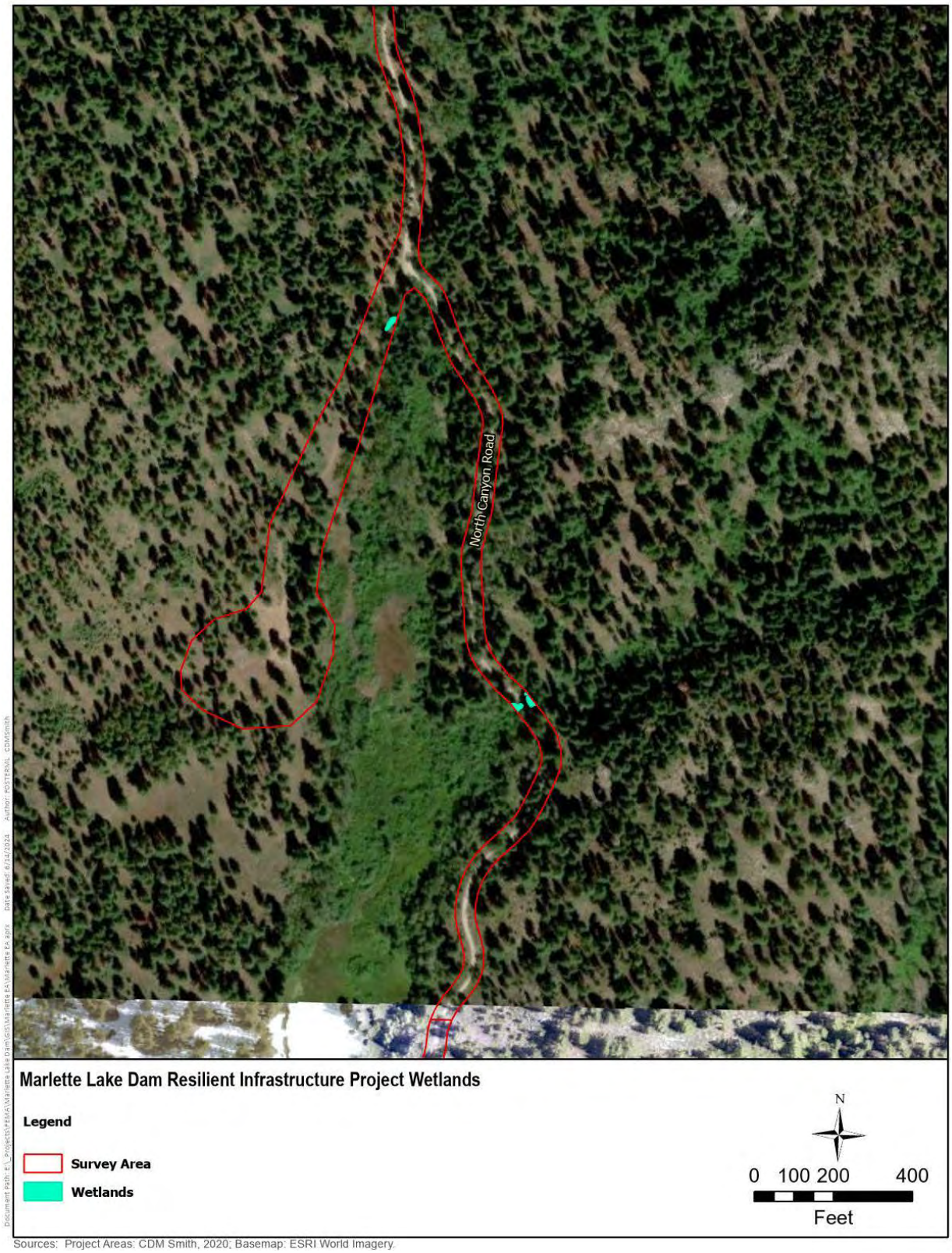


Figure 4-6. North Canyon Road (4 of 5) – Aquatic Resource Delineation Map

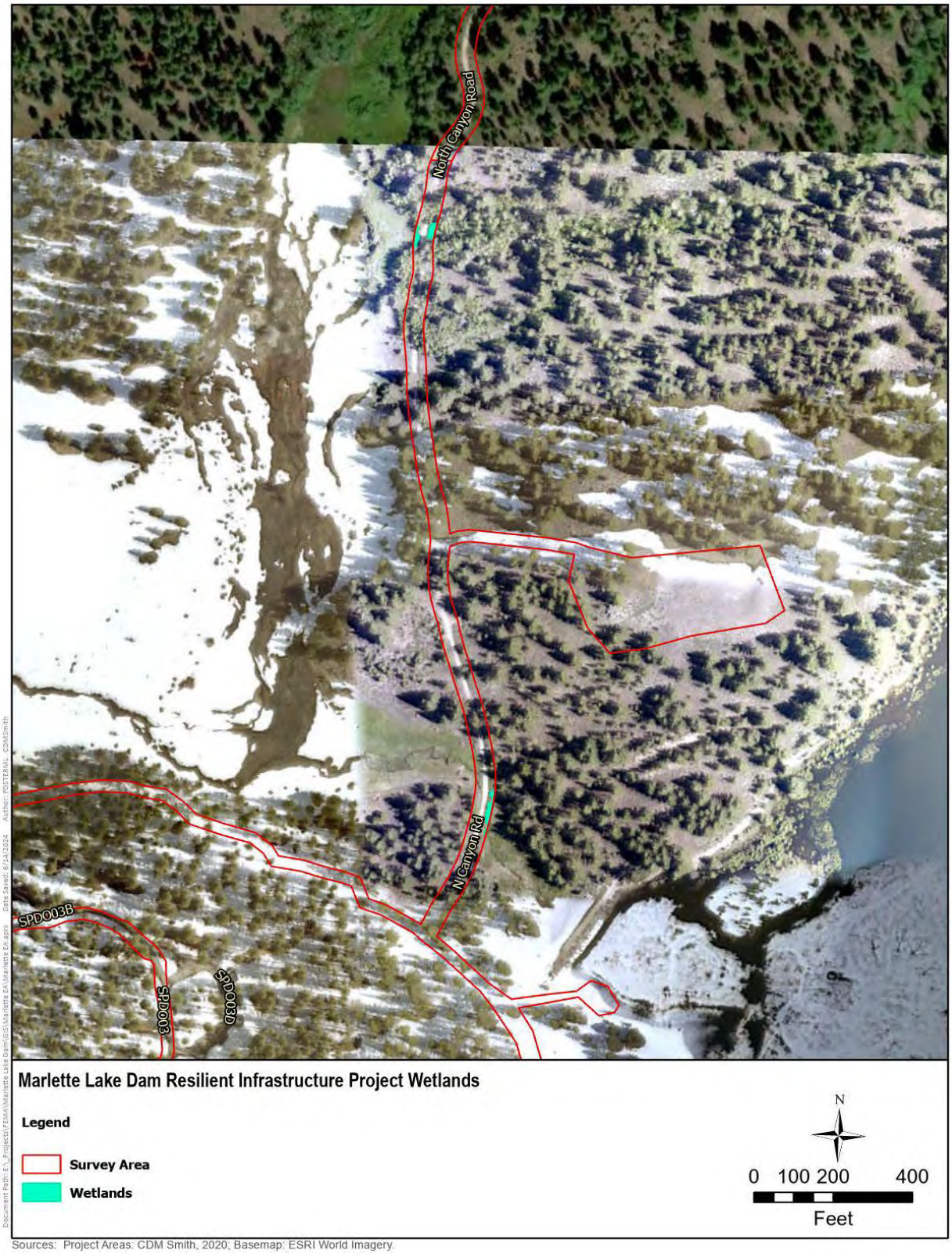


Figure 4-7. North Canyon Road (5 of 5) – Aquatic Resource Delineation Map

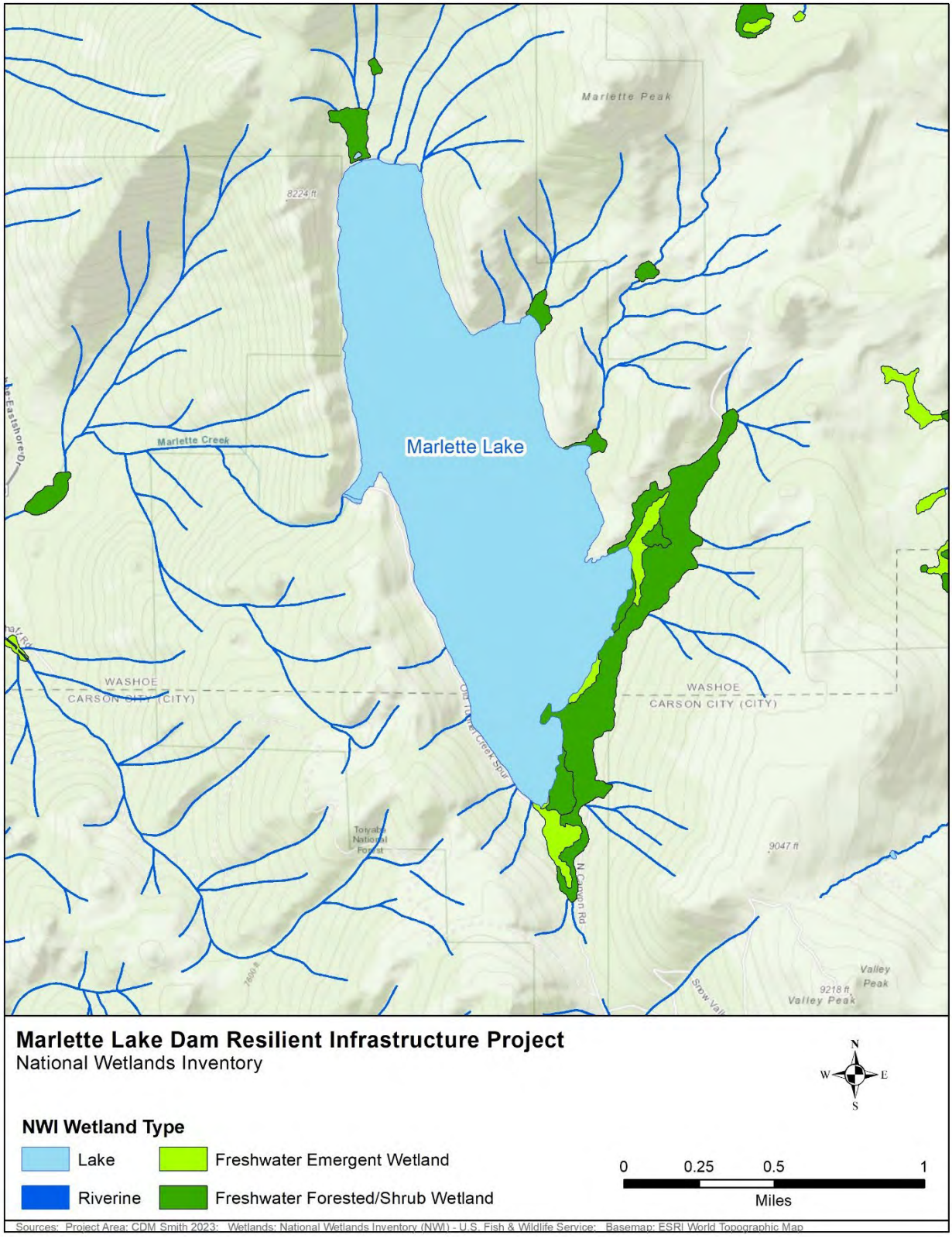


Figure 4-8. Marlette Lake – National Wetland Inventory Wetlands

4.6.2. PROPOSED ACTION

Under the proposed action, use of North Canyon Road by construction equipment may require temporary stabilization and culvert repair along the roadway, which could impact the 11 identified wetlands adjacent to North Canyon Road totaling 0.41 acres. Within the proposed staging area south of Marlette Lake, there are also 0.13 acres of wetland that may be impacted by project activities. In addition, at the dam site, 0.02 acres of emergent wetland associated with the head of Marlette Creek would be permanently impacted by the extension of the new primary outlet and installation of a riprap basin at the pipe outlets, and the placement and grading of fill material. SPWD would obtain any USACE permits that may be required for work that impacts wetlands and restoration of temporarily impacted wetlands and mitigation for permanent impacts also may be required.

In addition to the wetlands that may be impacted directly by construction activities, the approximately 6,595 linear feet of wetlands identified in the NWI maps that abut the Marlette Lake shoreline would be adversely impacted by lower lake elevations. Lower lake elevations could "dry up" wetlands that are hydrologically dependent on the lake water. Stream and seep fed wetlands that are not dependent upon hydrology from the lake may not be as substantially impacted. Therefore, the proposed action would have a moderate short-term adverse effect on wetlands from construction-related direct disturbance and indirect disturbance caused by the drawdown of the lake.

After the completion of construction, it is anticipated that it would take approximately 6 years for the lake to fill back to normal pool elevations. At that time, wetlands that had been dependent upon lake hydrology that "dried up" while the lake was drawn down would be hydrologically reconnected to the lake and wetland conditions would be expected to return over the course of a few years. Further, improvements to the access road that would impact wetlands would be permanent and wetlands that were impacted may not reestablish. Therefore, there could be a minor adverse effect on wetlands around the access road. However, the risk of dam failure would be reduced under this alternative and adverse impacts on water quality and water supply would be less likely. Downstream wetlands would be better protected from debris flows caused by a dam breach. Therefore, the proposed action would have a minor beneficial effect on downstream wetlands in the long term.

Appendix B provides the eight-step decision-making process for wetlands and the wetlands delineation for the proposed action.

4.7. Floodplains

EO 11988, Floodplain Management, requires federal agencies to avoid, to the extent possible, short- and long-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative. FEMA regulations (44 CFR Part 9.7) use the 1-percent annual chance flood as the minimal area for floodplain impact evaluation.

The project area is covered by FEMA Flood Insurance Rate Map (FIRM) Panels 32031C3425G (effective panel), effective date March 16, 2009; 3200010075E and 3200010200E (not printed),

dated January 16, 2009; and 32005C0035G (effective panel), effective date January 20, 2010. According to the FIRMs, the dam and the construction area are partially within a special flood hazard area (Zone A) and the access routes, turnouts, and staging areas are in Zone D, an Area of Undetermined Flood Hazard. North Canyon Road follows the bottom of a valley and crosses North Canyon Creek in multiple locations, which could make the area prone to flooding.

4.7.1. NO ACTION ALTERNATIVE

Under the no action alternative, there would be no short-term impacts on floodplains.

In the long term, the risk of dam failure would not be reduced. Flood modeling results completed in the development of the Marlette Lake Dam Emergency Action Plan indicate that in the event of a dam breach flood flows at extremely high velocities, more than 30 feet per second, with a flow volume of approximately 30,000 cubic feet per second would be released, threatening people and property downstream of the dam (SPWD 2014). This catastrophic release of water would scour out the creek channel and damage its ability to slow and infiltrate future stormwater flows resulting in runoff moving through the system more quickly and in greater volumes than under existing conditions. Therefore, the no action alternative could have minor to moderate long-term impacts on the floodplain as well as on natural floodplain functions depending on the severity of the damage resulting from a dam breach.

4.7.2. PROPOSED ACTION

The proposed action would have minor short-term impacts on the 100-year floodplain because of construction, including excavation and fill activities. Construction activities could cause an accidental release of hazardous waste during the construction period from minor leaks from construction equipment, and ground-disturbing activities could cause sediment to enter Marlette Lake, and therefore impact natural floodplain functions and values. Activities would be temporary, and the SPWD would implement erosion and sediment control BMPs and BMPs related to the use of fill, as discussed in Section 3.2.6. The work area would remain dewatered during construction, and any streamflow would be routed around the work area as needed. Temporarily impacted areas would be restored and stabilized following construction of the proposed action. Under the proposed action, the impacts of a 100-year flood event would remain approximately the same as compared to current conditions.

In the long term, the risk of dam failure would be reduced under this alternative and adverse impacts on floodplains would be less likely. With a reduced risk of a dam breach, the modified dam would help protect people and property downstream of the dam and preserve the flood storage capacity of Marlette Lake. Therefore, the project would have a minor beneficial impact on floodplains in the long term under this alternative.

Appendix B provides the eight-step decision-making process for floodplains.

4.8. Vegetation

Plant surveys of the proposed project area were conducted between June and July 2021, consisting of meandering transects from the centerline of the survey area (RCI 2021b). The survey area included the proposed project area around the dam and a 25-foot buffer on each side of the access road center line and all potential equipment staging and vehicle passing areas. Plant species were identified in the field or collected for identification using taxonomic keys. The results of the surveys are used to describe the vegetation within the proposed project area.

Within the lower elevations of the North Canyon Creek watershed, the project area vegetation is dominated by a Jeffrey pine (*Pinus jeffreyi*) and white fir (*Abies concolor*) forest community. There is a diverse shrub understory consisting of pinemat manzanita (*Arctostaphylos nevadensis*), antelope bitterbrush (*Purshia tridentata*), mountain sagebrush (*Artemisia tridentata*), tobacco brush (*Ceanothus velutinus*), mountain whitethorn (*Ceanothus cordulatus*), snowberry (*Symphoricarpos alba*), and several species of currents (*Ribes* spp.). The understory herbaceous layer is sparse, but often characterized by common forbs, including sticky cinquefoil (*Potentilla glandulosa*), alpine mountain balm (*Monardella odoratissima*), mule's ear (*Whethia mollis*), low phacelia (*Phacelia humilis*), and sulfur flower buckwheat (*Eriogonum umbellatum*). Common grasses include mountain brome (*Bromus marginatus*) and bottlebrush squirrel tail (*Elymus elymoides*) (RCI 2021b).

The project area is crossed multiple times by North Canyon Creek and its tributaries, often forming emergent wetlands adjacent to the access road. These wetlands were typically characterized by dense sedges (*Carex* spp.), rushes (*Juncus* spp.), and other wetland grasses including tufted hairgrass (*Deschampsia ceaspitosa*) and fowl mana grass (*Glyceria striata*) (RCI 2021b).

As the access road ascends in elevation, wetland seeps are frequent along the steep cut slopes adjacent to the access road. These wetlands are often dominated by willows (*Salix* spp.) or mountain alder (*Alnus incana*) and a dense herbaceous layer that includes false hellebore (*Veratrum californicum*), American cow-parsnip (*Heracleum maximum*), Parish's yampah (*Perideridia parishii*), and blue-pod lupine (*Lupinus polyphyllus*) (RCI 2021b).

At higher elevations and on the north facing slopes above Marlette Lake, quaking aspen (*Populus tremuloides*) is more prevalent and is found in dense stands along the access road interspersed with wetland seeps. The area surrounding the dam consists of steep granitic boulders with scattered antelope bitterbrush and an overstory of white fir (RCI 2021b).

4.8.1. INVASIVE SPECIES

EO 13112 requires federal agencies to prevent the introduction of invasive species and provide for their control to minimize the economic, ecological, and human health impacts that invasive species cause. EO 13112 requires that federal agencies not authorize, fund, or implement actions that are likely to introduce or spread invasive species unless the agency has determined that the benefits outweigh the potential harm caused by invasive species and that all feasible and prudent measures to minimize harm have been implemented. The proposed project area includes both terrestrial and aquatic habitats that may support invasive species.

Invasive terrestrial plant species that have been found in the East Lake Tahoe Basin and around Marlette Lake include hoary cress (*Cardaria draba*), Canada thistle (*Cirsium arvense*), bull thistle (*Cirsium vulgare*), tall whitetop (*Lepidium latiforium*), oxeye daisy (*Chrysanthemum leucanthemum*), and sulfur cinquefoil (*Potentilla recta*) (Dean and Morsbach 2011).

Invasive aquatic species that have the potential to occur within Marlette Lake include but are not limited to: Eurasian watermilfoil (*Myriophyllum spicatum*) and zooplankton such as the spiny waterflea (*Bythotrephes longimanu*), zebra (*Dreissena polymorpha*) and quagga (*Dreissena bugensis*) mussels, and introduced crayfish (*Pacifatacus leiuschulus*) (Caldwell and Chandra 2012).

4.8.2. NO ACTION ALTERNATIVE

4.8.2.1 Vegetation

Under the no action alternative, there would be no short-term construction-related impacts on vegetation in the project area.

In the long term, the risk of dam failure would not be reduced. In the event of dam failure, there would be impacts on Marlette Creek and vegetation within the creek valley. Vegetation could be completely uprooted from a massive influx of flood water through the valley. Additionally, floodwaters could scour the creek channel and banks down to bedrock, which would prevent regrowth. Silt and debris could be distributed throughout the valley, which could also impede growth after flood waters recede. Further, in the event of dam failure, water levels within the lake would recede from the banks and fringe wetland vegetation that is supported by lake hydrology would be lost. Previously inundated soils would be exposed that would be prone to the establishment of invasive species. Therefore, if the dam were to fail, the no action alternative could have moderate long-term adverse effects on vegetation within the Marlette Creek Valley depending on the severity of the damage resulting from a dam breach.

4.8.2.2 Invasive Species

Under the no action alternative, there would be no short-term construction. Therefore, there would be no short-term impacts on existing conditions including invasive species.

In the long term, the risk of dam failure would not be reduced. In the event of dam failure, vegetation within the Marlette Creek valley would be adversely impacted. Additionally, up to approximately 394 acres of previously inundated areas in Marlette Lake could be exposed and like other disturbed areas, would have an increased risk of invasion from invasive species. Therefore, if the dam were to fail, the no action alternative could have minor long-term adverse effects on invasive species in the Marlette Creek valley and the Marlette Lake basin.

4.8.3. PROPOSED ACTION

4.8.3.1 Vegetation

Under the proposed action, vegetation and trees would be removed along the downstream side of the dam and along the access road. Vegetation removal would be minimized to the extent practicable. Where necessary within the construction access corridor and at designated passing areas, existing vegetation would be trimmed to the minimum height necessary for construction equipment to pass without damaging the health of the existing plants. Further, most of the construction areas are previously disturbed and minimal vegetation and tree removal (up to 19 trees) would occur in these areas. Because there are several thousand acres of similar vegetation and habitats surrounding the proposed project area, the limited vegetation removal associated with construction of the proposed action would be negligible in both the short and long term.

In the long term, the risk of dam failure would be reduced under this alternative and adverse impacts on vegetation would be less likely. With a reduced risk of a dam breach, the modified dam would help protect vegetation downstream of the dam. Therefore, the project would have a minor beneficial impact on vegetation in the long term under this alternative.

4.8.3.2 Invasive Species

In the short term, areas of ground disturbance would be revegetated in accordance with the *TRPA Best Management Practices Handbook* or covered with weed-free mulch. Additionally, all construction equipment and vehicles would be washed and inspected for weed seeds and plant parts prior to bringing them onto the property and vehicles or other traffic that may transport weed seed or plant materials would be restricted from entering the site. If infestations of invasive plants are discovered during project implementation, they would be documented, mapped, and avoided. If they cannot be avoided during project implementation, they should be removed before they form seed heads or are spread by other methods. Therefore, the proposed action would have no to negligible adverse effects on invasive species in the short term.

In the long term, approximately 103 acres of previously inundated soils would be exposed during the lake draw down. This newly exposed area would be susceptible to the establishment of invasive species. Invasive species that establish in these newly exposed soils would eventually be killed when the lake is brought back to full pool; however, seeds from these newly established invasive plants could spread. Invasive seeds may outcompete native plants and establish invasive species in areas that were previously dominated by native species. Therefore, the proposed action could have a minor to moderate adverse effect on invasive species in the long term.

4.9. Fish and Wildlife

Fish and wildlife are protected by state laws that regulate hunting, trapping, fishing, and habitat alteration. Specific species are also protected by federal laws such as the Endangered Species Act (ESA), the Migratory Bird Treaty Act, the Bald and Golden Eagle Protection Act, and the Magnuson-Stevens Fishery Conservation and Management Act. Potential impacts on common terrestrial and aquatic species are evaluated in this section. The evaluation of potential impacts on threatened and

endangered species is presented in Section 4.10. The evaluation of potential impacts on migratory birds is presented in Section 4.9.2.3. The evaluation of potential impacts on eagles is presented in Section 4.9.2.4. Essential fish habitat does not occur within or near the project area; therefore, essential fish habitat is not evaluated in this EA.

Wildlife surveys of the proposed project area were conducted between May and June 2021. These surveys focused primarily on identifying bald eagle (*Haliaeetus leucocephalus*) nesting pairs that could be disturbed by the proposed action. These surveys also noted the habitat conditions and any species observed during the surveys (RCI 2021c).

The project area is within the Sierra Nevada Mountains ecoregion, and the habitats found within the project area are primarily upper montane coniferous forests and woodlands; lakes and reservoirs; and minor inclusions of high elevation sagebrush and aspen woodlands (RCI 2021c). Terrestrial wildlife species that may occur within these habitats include Sierran chorus frog (*Pseudacris sierra*), western toad (*Anaxyrus boreas*), mule deer (*Odocoileus hemionus*), black bear (*Ursus americanus*), American pine marten (*Martes americana*), Douglas squirrel (*Tamiasciurus douglasii*), golden-mantled ground squirrel (*Callospermophilus lateralis*), raccoon (*Procyon lotor*), yellow-bellied marmot (*Marmota flaviventris*), western fence lizard (*Sceloporus occidentalis*), western terrestrial garter snake (*Thamnophis elegans*), osprey (*Pandion haliaetus*), northern goshawk (*Acipiter gentilis*), and peregrine falcon (*Falco peregrinus*) (iNaturalist 2023; RCI 2021c; U.S. Forest Service 2023).

Marlette Lake serves as a brood stock source for both rainbow (*Onocorhynchus mykiss*) and LCT (*Oncorhynchus clarkii henshawi*). Each spring, NDOW establishes a spawning station on the south end of Marlette Lake as soon as snow melt allows. Fish attempting to spawn up Marlette Creek and fish that are caught by NDOW in the lake are spawned and released. NDOW stocks the lake annually to maintain a brood stock. Brook trout (*Salvelinus fontinalis*) also inhabit and naturally reproduce in the lake.

The Migratory Bird Treaty Act (MBTA) of 1918, as amended (16 U.S.C. 703–711), provides that it is unlawful to pursue, hunt, take, capture, kill, possess, sell, purchase, barter, import, export, or transport any migratory bird, or any part, nest, or egg of any such bird, unless authorized under a permit issued by the SOI. Some regulatory exceptions apply. Take is defined in regulations as: 'pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to pursue, hunt, shoot, wound, kill, trap, capture, or collect.' All native birds are protected by the MBTA, and existing habitat in the project area has the potential to support a variety of native bird species. Several migratory bird species could occur in the project area, including Cassin's finch (*Carpodacus cassinii*), Lewis's woodpecker (*Melanerpes lewis*), pinyon jay (*Gymnorhinus cyanocephalus*), and western grebe (*Aechmophorus occidentalis*) (USFWS 2023c).

The Bald and Golden Eagle Protection Act of 1940 prohibits the take, possession, sale, or other harmful action on any golden or bald eagle, alive or dead, including any part, nest, or egg (16 U.S.C. 668[a]). Bald eagle nesting territories are normally associated with lakes, reservoirs, rivers, or large streams. Bald eagle nests are usually located in uneven-aged (multi-storied) conifer stands with old growth components. There was a known nest just south of the dam; however, in recent years this

nest blew down and surveys conducted in 2021 did not locate a new or reconstructed nest in the vicinity of the blown-down nest. There are two additional known nests near the proposed project area. One of the known nests is relatively close to the dam (approximately 0.1 miles south); however, a large cliff face provides a visual and auditory barrier between the proposed project area and the nest. A second known nest occurs on the far north shore of the lake. Additionally, a pair of eagles has been confirmed using the lake by NDOW in past years and a pair of adult bald eagles and a yearling bald eagle were observed during surveys in 2021, but it is not known which nest they may be associated with. No suitable habitat for golden eagles occurs within or near the proposed project area; therefore, golden eagles are not expected to occur within or near the proposed project area (RCI 2021c).

4.9.1. NO ACTION ALTERNATIVE

Under the no action alternative, there would be no short-term impacts on terrestrial wildlife, aquatic life, migratory birds, or eagles.

In the long term, the risk of dam failure would not be reduced. In the event of a dam breach, there would be impacts on terrestrial wildlife within the Marlette Creek Valley and aquatic life within Marlette Lake and Marlette Creek from a rapid increase in streamflow and overbank flooding and a rapid decrease in lake elevations. Within the stream itself, a rapid increase in flow may alter and degrade in-stream habitats or possibly even redirect the stream channel. The stream channel would likely be scoured of loose substrates (e.g., gravel, cobbles, woody debris) that provide habitat and the channel deepened and straightened, reducing habitat complexity for aquatic life. If the dam breach were significant enough to increase downstream flows to the point where they overtopped the banks, terrestrial species in the area that burrow or live underground could be adversely impacted by flood waters. Additionally, in the case of a catastrophic dam failure, it is expected that the lake would drawdown to much lower levels than those anticipated under the proposed action. This drawdown would occur very rapidly over the course of a few hours to days instead of a year. This quick drawdown would strand aquatic species, in particular fish species in areas that dry up or in pools that become hydrologically disconnected from the main pool. Therefore, if the dam were to fail, the no action alternative would have moderate to major long-term effects on both terrestrial and aquatic species depending on the severity of the damage resulting from a dam breach.

Effects on larger mammals and birds from a dam breach would be negligible because they would be able to avoid the area impacted and the surrounding area provides thousands of acres of similar habitat.

4.9.2. PROPOSED ACTION

4.9.2.1 Terrestrial Wildlife

Under the proposed action, there would be short-term minor impacts on terrestrial wildlife species. There would be an increase in human activity and noise within and around the proposed project area. Terrestrial wildlife species that occur within or near to the proposed project area could be directly or indirectly impacted from construction activities associated with the proposed action.

Impacts on these species could range from minor activity disturbance from construction-related noise, visual disruption, and dust to mortality from direct contact with equipment or crew. Impacts on avian species would be minimized by implementing BMPs described in Section 3.2. Further, BMPs described in Section 3.2 would preclude terrestrial species from impacts associated with project-related erosion and invasive species. Therefore, under the proposed action there would be minor short-term adverse impacts on terrestrial wildlife.

In the long term, the area of disturbance would return to pre-project conditions except for the area along the base of the dam where the embankment would be extended that would be kept clear of vegetation. This area would be approximately 0.25 acres and the amount of habitat lost from vegetation removal would be discountable. Therefore, the proposed action would have a negligible impact on terrestrial wildlife in the long term.

4.9.2.2 Aquatic Life

The proposed action would require the drawdown of Marlette Lake to an elevation of approximately 7,820 feet AMSL. Additionally, in-water work would be required to install the cofferdam that would be used to isolate the forebay work area. Decreased water levels from reservoir drawdown would have the potential to cause a suite of water quality issues, including increased temperatures during the summer months, lowered dissolved oxygen, and increased turbidity within the remaining lake waters.

In the short term, water levels and the surface area of the lake would be decreased. At the completion of drawdown, lake elevations would be approximately 25 feet below normal pool levels and the surface area of the lake would be reduced from approximately 393.7 acres to 285.0 acres (**Figure 3-7**). Aquatic species would be subject to adverse effects from decreased habitat availability and changes in habitat conditions (i.e., decreased water quality) for a period of up to approximately 6 years for construction and refilling of the lake. The reduction in lake volume that would result from drawdown would depend on the water level of the lake at the time drawdown commences.

Based on lake bathymetry, is it expected that most of the habitat that would be temporarily lost as a result of drawdown would be the shallow littoral areas, which predominately occur along the north, south and eastern shores of the lake. These habitats generally provide richer food resources and more physically complex habitats that mediate competition and predation and support a greater diversity of aquatic species. Habitat loss from reservoir drawdown would concentrate aquatic species in the remaining waters, which would lead to an increased likelihood of avian predation, increased intra- and interspecific competition for resources, and increased potential for the spread of disease (FEMA 2023a). Further, ground disturbance from construction near the lake could result in erosion and soils being washed into the water in stormwater runoff. This erosion and runoff could lead to localized short-term decreases in water quality in Marlette Lake by temporarily increasing levels of suspended sediments resulting in increased turbidity and sedimentation. However, most construction work would occur after reservoir drawdown, which would increase the distance between areas of soil disturbance and the water's edge. In-water work that may occur before installation of the cofferdam (e.g., installation of an underwater concrete pad and excavation of unstable material), during installation of the cofferdam, and during removal of the cofferdam could also cause temporary localized decreases in water quality in the form of increased turbidity. Additionally,

proposed construction activities could result in the accidental introduction of chemicals associated with construction equipment to Marlette Lake through spills or leaks. In the short term, impacts of these substances on aquatic habitats could include harm to or mortality of aquatic species through poisoning or suffocation if concentrations of introduced contaminants were high. However, as described in Section 3.2, BMPs would be implemented to reduce the potential for adverse water quality impacts and NDOW would perform fish salvage procedures necessary prior to and/or during dewatering. Therefore, the proposed action would have a moderate adverse effect on aquatic life in the short term.

In the long term, if drinking water withdrawals are maintained at normal rates, the average annual refill rate is expected to be approximately 3 feet of elevation per year. If pumping is reduced, the refill rate would be faster; however, the exact rate would depend on the weather and precipitation levels. Assuming a lake recovery rate of approximately 3 feet per year, and no change to pumping operations, the lake would take up to approximately 6 years to return to pre-project levels after construction is completed. After the lake has returned to pre-project levels, it is anticipated that habitat conditions within and around the lake would also return to pre-project conditions. Therefore, there would be no long-term adverse effects on aquatic life from implementing the proposed action.

The risk of dam failure would be reduced under this alternative and adverse impacts on aquatic species in the area would be less likely. With a reduced risk of a dam breach, the modified dam would help preserve the aquatic habitat within Marlette Lake. Therefore, the project would have a moderate beneficial impact in the long term under this alternative.

4.9.2.3 Migratory Birds

The proposed action could affect migratory birds if work were to occur during the breeding season. Vegetation removal along the dam face, including up to 19 trees, could damage or destroy nests. If vegetation removal is scheduled during the nesting season (March 1 to August 31), a focused survey for migratory bird nests would be completed by a qualified wildlife biologist within a minimum radius of 500 feet. If active nests are found, the nest would be avoided, and a disturbance buffer would be established by the project biologist in coordination with NDOW. The extent of the buffer would be dependent on the species, noise levels, or construction disturbance and other topographical or artificial barriers. The buffer would be kept in place until after the nesting season or when the project biologist confirms the young have fledged. The drawdown of the lake would reduce the water surface area of the lake by approximately 28 percent. However, because the lake is steeper around the shoreline, the majority of shallow, littoral areas used for foraging by migratory waterfowl would be lost and food would not be as abundant. Therefore, the proposed action would have minor short and long-term adverse impacts on migratory birds.

4.9.2.4 Eagles

Under the proposed action, eagle foraging habitat would be affected by drawdown of the lake. During the drawdown, shallow littoral areas that provide habitat for prey species—predominately occurring along the north, south, and eastern shores of the lake would be substantially reduced. This habitat loss would concentrate prey species in remaining waters, which could lead to increased hunting

success. However, these shallow littoral areas are relatively small compared to the entirety of the lake and the drawdown of the lake would reduce the water surface area by approximately 28 percent. Terrestrial areas that support small mammals would proportionally increase in the draw down areas and would likely support increased herbaceous vegetation, and thus small mammal populations, before being inundated again as the lake refills. Therefore, there would be negligible short- and long-term beneficial effects on foraging habitat.

To assess and minimize impacts to nesting bald eagles, surveys would be completed prior to construction to determine if and where a new nest is established. If active nests are identified, SPWD would consult with the USFWS and NDOW on the appropriate buffer size and monitoring and reporting to USFWS and NDOW would be on-going weekly throughout the duration of construction. If vegetation removal is scheduled during the nesting season (March 1 to August 31), a focused survey for bald eagle nests would be completed by a qualified wildlife biologist at a minimum radius of 0.5 miles around the project area. If active nests are found, the nest would be avoided, and a disturbance buffer would be established by the project biologist in coordination with NDOW. The extent of the buffer would be dependent on noise levels or construction disturbance and other topographical or artificial barriers. The buffer would be kept in place until after the nesting season or when the project biologist confirms the young have fledged. Additionally, if activities associated with the proposed action would result in any disturbance to the breeding productivity of bald eagles during construction activities, an incidental take permit pursuant to the Bald and Golden Eagle protection Act and subsequent Eagle Permit Rule would be obtained. Therefore, dependent upon the proximity of any bald eagle nests to the proposed project area, the proposed action could have no to minor adverse effects on nesting bald eagles in the short term. In the long term, nesting habitat would not be degraded and after the completion of construction, the proposed project area would generally return to pre-construction conditions. Therefore, there would be no effect on nesting bald eagles in the long term.

4.10. Threatened and Endangered Species and Critical Habitat

The ESA of 1973 gives USFWS and the National Marine Fisheries Service (NMFS) authority for the protection of threatened and endangered species. This protection includes a prohibition on direct take (e.g., killing, harassing) and indirect take (e.g., destruction of habitat).

The ESA defines the action area as “all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action” (50 CFR 402.02). Therefore, the action area (AA) where effects on listed species must be evaluated may be larger than the areas where project activities would occur. The proposed AA consists of the proposed project area (comprising the limits of construction within the lake and on the existing dam face, the proposed staging areas, and access routes), a buffer of 100 feet around upland portions of the project area along Marlette Lake where there could be effects on water quality from project-related erosion and sedimentation, and all of Marlette Lake, because the entirety of the lake would be affected by reservoir drawdown. Thus, the AA encompasses approximately 452 acres.

FEMA conducted a desktop review to collect information on federally listed species under NMFS or USFWS jurisdiction with the potential to occur within or near the AA. The scope of the desktop review included the area within a 10-mile radius of the AA. The review consulted the following sources:

- USFWS Information for Planning and Consultation (IPaC) (USFWS 2023c)
- USFWS Critical Habitat Mapper (USFWS 2023d)
- Essential Fish Habitat Mapper (NMFS 2023a)
- NMFS Protected Resources Application (NMFS 2023b)

FEMA reviewed recovery plans and other published literature for further details concerning species occurrences and status in the region, habitat preferences, documented historical and current ranges, and life histories. No species or habitats under NMFS jurisdiction occur within or near the AA. No designated critical habitat occurs within 10 miles of the AA.

Wildlife surveys were conducted between May and June 2021. Although, these surveys focused primarily on identifying bald eagle nesting pairs that could be disturbed by the proposed action, they also noted habitats and observed species (RCI 2021c). Additionally, biologists from NDOW and USFWS conducted a survey in spring 2022 to determine whether Sierra Nevada yellow-legged frog (*Rana sierrae*) occur within the AA, which resulted in a negative finding (Mellison 2022). Therefore, the Sierra Nevada yellow-legged frog is not expected to occur within or near the AA.

Plant Species

Based on the desktop review, a single threatened plant species, whitebark pine (*Pinus albicaulis*), has potential to occur within the AA. However, according to the findings of special-status plant surveys conducted in 2021, no suitable habitat for whitebark pine occurs within the AA (RCI 2021b). Therefore, this species is not considered further in this EA.

Fish and Wildlife Species

The desktop review identified four listed species and two species proposed for listing as having potential to occur within the AA. Based on field survey findings and input from USFWS provided during early coordination, one listed species (LCT) has potential to occur within the AA and be affected by the proposed action. FEMA dismissed all other species from further consideration in this EA because (1) the AA is not within the species known range, (2) suitable habitat for the species does not exist within the AA, and/or (3) focused surveys for the species resulted in a negative finding.

LCT: The proposed project area is within the current known range for the threatened LCT. LCT inhabit both lakes and streams. Lacustrine LCT populations have adapted to a wide variety of lake habitats from oligotrophic (with low nutrient levels and primary productivity) alpine lakes to large, productive desert terminal lakes (e.g., Pyramid Lake). Unlike most freshwater fish species, LCT have been reported to tolerate alkalinity and total dissolved solid levels as high as 3,000 and 10,000 parts per million, respectively (USFWS 2009).

Although LCT inhabit lakes, they are obligate stream spawners. Spawning generally occurs from April through July, depending upon streamflow, elevation, and water temperature (Moyle 2002; USFWS 2009). LCT in streams generally become sexually mature around 3 years of age, while LCT in lakes become sexually mature between 3 and 4 years of age (USFWS 2009).

In lakes, small cutthroat trout largely feed on insects or zooplankton. However, if neither is available, they will feed on bottom-dwelling insect larvae, crustaceans, and snails (Moyle 2002). Large lake-dwelling cutthroat trout (i.e., those measuring more than approximately 1 foot fork length) feed mainly on other fish (Moyle 2002).

LCT only occur within the AA in Marlette Lake. NDOW introduced LCT to Marlette Lake in 1964. NDOW currently manages the Marlette Lake LCT population as brood stock for their hatchery program. Each spring, NDOW operates a spawning station on a tributary along the southern end of the lake where fish are captured, spawned, and released. Because LCT are unable to naturally reproduce in the lake, NDOW stocks the lake annually to maintain the population. According to information provided by NDOW, LCT in Marlette Lake generally live for approximately 5 years (Hawks 2023). Based on NDOW stocking records for the past 6 years (**Table 4.5**), the Marlette Lake LCT population is generously estimated to comprise approximately 21,000 individuals at the time that the proposed action would be initiated (FEMA 2023a).

Table 4.5. Marlette Lake Lahontan Cutthroat Trout Stocking History

Date	Number of LCT Stocked
July 11, 2018	375
October 11, 2019	5,020
June 26, 2020	6,095
August 30, 2022	8,192
September 5, 2023	1,754

Source: NDOW 2023

4.10.1. NO ACTION ALTERNATIVE

Under the no action alternative, there would be no construction; therefore, there would be no short-term impacts on threatened and endangered species or their habitats.

In the long term, effects on threatened species from the no action alternative would be the same as those described for aquatic species in Section 4.9.1. In the event of a dam breach, the quick drawdown of Marlette Lake could strand aquatic species, including LCT, or wash them out into the creek system. Any remaining lake area would be greatly reduced from its current extent. Therefore, if the dam were to fail, the no action alternative could have moderate to major long-term effects on LCT and its habitat depending on the severity of the damage resulting from a dam breach.

4.10.2. PROPOSED ACTION

Under the proposed action, because the only listed species that has the potential to occur is the LCT, effects on listed species would be the same as those described for aquatic species in Section 4.9.2.2. In the short term, water levels and surface area within the lake would be decreased. LCT would be subject to effects from decreased habitat availability and changes in habitat conditions (i.e., water quality) for a period of up to approximately 6 years while the lake refills. As described in Section 3.2, BMPs would be implemented to reduce the potential for adverse water quality impacts and NDOW would perform fish salvage procedures necessary prior to and/or during the dewatering of the waterward side of the dam. Therefore, the proposed action would have a moderate adverse effect on LCT in the short term.

After the lake has returned to pre-project levels, it is anticipated that habitat conditions within and around the lake would also return to pre-project conditions. The risk of dam failure would be reduced under this alternative and adverse impacts on LCT would be less likely. With a reduced risk of a dam breach, the modified dam would help preserve the aquatic habitat within Marlette Lake. Therefore, the proposed action would have a moderate beneficial impact in the long term.

A Biological Assessment to analyze the potential impacts from the proposed action on threatened and endangered species was submitted to USFWS on July 1, 2023. On December 28, 2023, USFWS issued a biological opinion (File Number 2022-0079054) with the determination that the proposed action may affect, and is likely to adversely affect the LCT.

4.11. Cultural Resources

Section 106 of the National Historic Preservation Act of 1966, as amended (54 U.S.C. 306108), requires that projects receiving federal funds undergo a review process to consider potential effects on historic properties, which are defined as cultural resources that are listed in or may be eligible for listing in the National Register of Historic Places (NRHP). Cultural resources can include prehistoric or historic period archeological sites; historic period buildings, structures, or objects; prehistoric or historic period districts; Traditional Cultural Properties with cultural or religious significance to federally recognized tribes; or other physical evidence of human activity considered to be important for cultural, scientific, traditional, religious, or other reasons.

Pursuant to 36 CFR 800.4(a)(1), an Area of Potential Effect (APE) was defined to include areas within which the project activities (undertaking) may directly or indirectly affect cultural resources. The total APE for the project spans approximately 156.1 acres and includes all project work areas, staging/stockpile locations, pullouts, and access routes. The APE also includes the lakebed area that would be exposed by the reservoir drawdown.

On April 21, 2022, FEMA initiated consultation with nine tribes and two historic societies about the action alternatives to solicit comments and request any additional information about cultural resources that may be impacted by the action alternatives. Tribes contacted included the Confederated Tribes of the Warm Springs Reservation of Oregon; Fort McDermitt Paiute and Shoshone Tribes of the Fort McDermitt Indian Reservation; Paiute-Shoshone Tribe of the Fallon Reservation and Colony; Pyramid Lake Paiute Tribe of the Pyramid Lake Reservation; Reno-Sparks

Indian Colony; Walker River Paiute Tribe of the Walker River Reservation; Washoe Tribe of Nevada and California; and Yerington Paiute Tribe of the Yerington Colony & Campbell Ranch. The two historic societies contacted included Nevada Historical Society and Carson City Historical Society. FEMA again initiated consultation with the tribes to updated them on the final delineation of the APE and project description on April 21, 2024. Patrick Burtt, Tribal Historic Preservation Officer for the Washoe Tribe of California and Nevada (Washoe Tribe), expressed interest in being a consulting party in discussions with FEMA. FEMA is continuing to consult with the tribes, including the Washoe Tribe.

FEMA conducted a records search through the Nevada Cultural Resource Information System for the project APE and a surrounding 0.5-mile buffer. Marlette Lake Dam is part of the Marlette Lake Water System, a historic district listed in the NRHP. In addition, 50 archaeological or historic period-built environment resources have been previously recorded within the project APE. Portions of the APE have been subject to prior surveys. Qualified contractors for SPWD conducted an initial archaeological and historic architectural assessment of the APE in June 2021. More intensive field surveys, including archaeological test excavations at four sites, were completed in 2022 and 2023.

4.11.1. NO ACTION ALTERNATIVE

Under the no action alternative, there would be no construction-related impacts on historic properties or resources in the APE or the surrounding area.

In the long term, continued seepage and dam breach could compromise the contextual setting of potentially eligible properties or structures associated with the dam and water system, and, in extreme circumstances, could result in the loss of historic structural integrity should the land become unstable. In addition, as discussed in Section 4.7, in the event of a dam breach, flood flows would be released at extremely high velocities, threatening people and property downstream of the dam. Known and unknown historic properties downstream of Marlette Lake could be damaged or destroyed in the event of a dam breach. One such resource, the Thunderbird Lodge (also known as the Whittell Estate), a historic waterfront estate built in 1934 and listed in the NRHP, is directly downstream of the Marlette Lake Dam spillway (National Park Service 2000). Therefore, in the event of dam failure, the no action alternative would have minor to major impacts on historic resources depending on the severity of the damage resulting from the dam breach.

4.11.2. PROPOSED ACTION

Archaeology

Following the initial field visits, the APE was modified to avoid impacts to known cultural resources to the greatest extent possible. With this modification, FEMA determined that all but four known archaeological sites would be avoided by the project. One of these four sites, Site 26DO311, could not be relocated during multiple survey and subsurface testing efforts; however, should project activities uncover cultural remains at the site location, all work would halt immediately and not resume until a qualified archaeologist has examined and assessed the find. Two of the four sites, 26OR335 and 26OR345, were determined to be separate loci of a single resource that has been

recommended eligible as a contributing element of the NRHP-listed Marlette Lake Water System with SHPO concurrence; feature and artifact loci at the site are just outside of the APE and would be protected with temporary fencing, with adjacent ground-disturbing activities limited to the existing road prism. The fourth site, Site 26WA2811/6930 or Marlette Station, was identified through intensive mapping and subsurface testing. It has been recommended eligible as a contributing element of the NRHP-listed Marlette Lake Water System with SHPO concurrence. All five of the site's loci, which have been determined to be outside of project activity areas, would be protected with temporary fencing and closely monitored. As discussed in Section 3.2, measures to minimize impacts would be implemented during construction, including archaeological monitoring; tribal monitoring (if requested); use of temporary boundary fencing to protect resources and to define the limits of ground-disturbing activities; limits on vegetation management (e.g., limited tree trimming or flush cutting trees with no root ball removal); use of BMPs (e.g., water trucks, spraying to limit dust emissions); and notification protocols for unanticipated discoveries. These measures are described further in Appendix A, Agency Correspondence. Therefore, there would be no adverse effect with implementation of the conditions on any known archaeological resources within, or near, the APE.

The dewatering and drawdown area during construction of the proposed project would expose areas around the circumference of Marlette Lake that are typically inundated and have been inaccessible to archaeological and historic architectural surveys. FEMA has developed a Phased Section 106 Protocol to conduct an archaeological survey following the drawdown and implement mitigation measures to mitigate potential adverse effects to historic properties, if necessary, within the dewatering and drawdown area. However, the discovery of significant unknown resources is not anticipated as most of the drawdown area has low potential to reveal intact archaeological deposits.

Built Environment

Following a review of the records search results from the Nevada State Museum in Carson City, eight historic period (i.e., at least 50 years old) built environment resources were identified that are wholly or partially within the project APE. Numerous other historic sites are located outside of but immediately adjacent to the APE. The boundaries of these latter sites would be marked by temporary fencing, signage or other means, and no ground-disturbing activities would be permitted within their boundaries.

Marlette Lake Dam (260R393/WA6931), a combination stone masonry and earthen embankment dam that impounds water from Marlette Creek and other tributaries to form Marlette Lake, was listed in the NRHP in 1992 as a contributing feature of the Marlette Lake Water System Historic District (NR#920001162). According to the 1992 Historic District NRHP Nomination Form, the "Marlette Lake Water System, although altered several times since its origin in 1873, retains its original configuration" (Abbe 1992:2). Therefore, the Marlette Lake Water System Historic District retains its importance not only as a nineteenth century water conveyance and storage system, but also as one that has persisted through the twentieth century and beyond, functioning in much the same way and supplying the same purpose and need even as individual components have been replaced or upgraded. **Table 4.6** lists the eligibility determinations for Marlette Lake Dam and the seven other historic period built environment resources identified within the APE.

Table 4.6. Built Environment Determinations of Eligibility

Resource	Nevada Site Number	NRHP Eligibility
Marlette Lake Dam	26OR393/WA6931	Eligible as a contributor to a listed historic district
Tunnel Creek Flume	26WA6929	Eligible as a contributor to a listed historic district
Marlette Lake to Highway 28 Road	26WA6932/OR394	Ineligible
North Canyon Road (South Section)	26OR346/DO751	Eligible as a contributor to a listed historic district
North Canyon Road (North Section)	26OR347/WA6955	Eligible as a contributor to a listed historic district
Reservoir Intake Ditch	26DO730/OR383	Ineligible
Reservoir Outlet Ditch	26DO729	Ineligible
South Ditch	26DO728-7H	Ineligible
Glenbrook Railroad Grade	26DO605/OR247	Eligible as a contributor to a listed historic district

The project APE partially intersects the boundary of Tunnel Creek Flume, which is listed in the NRHP as a contributing feature of the Marlette Lake Water System Historic District. However, it was determined that the portion of Tunnel Creek Flume within the project APE does not contribute to the significance of the resource. The project APE also includes North Canyon Road (north and south sections) and the Glenbrook Railroad Grade as construction access routes. Use of North Canyon Road (South Section) and Glenbrook Railroad Grade for project access is not expected to damage the road or railroad grade. If damage does occur, the road would be temporarily stabilized by adding a 3- to 6-inch-thick aggregate base layer to prevent excessive rutting and erosion. Stabilized areas would be restored to pre-project conditions after construction is complete, in keeping with the SOI's Standards for the Treatment of Historic Properties. The project would thus not introduce permanent visual, atmospheric, or audible elements or diminish the properties' integrity of location, setting, design, materials, workmanship, feeling, or association. As such, the project would not have adverse effect on North Canyon Road (South Section) or the Glenbrook Railroad Grade.

The project would also raise the northwest end of North Canyon Road (North Section), adjacent to the dam, to keep it above the highwater level. The elevation of North Canyon Road (North Section) would be completed using fill materials consistent with the current alignment, but it would alter the appearance of the road. The proposed action would modify the Marlette Lake Dam, as described in Section 3.2, including embankment stabilization, outlet improvements, and seepage improvements. Although Marlette Lake Dam would remain a functioning part of the Marlette Lake Water System Historic District after project modifications are completed, the proposed seismic safety

improvements would permanently and physically alter the dam from its 1959 construction as captured in the 1992 Historic District Nomination Form. These permanent modifications to the road and dam, though necessary, would be considered an adverse effect. As discussed in Section 3.2.6, adverse effects would be resolved through the implementation of the Abbreviated Consultation Process and Treatment Measures outlined in Appendix C of FEMA's Programmatic Agreement among FEMA, SHPO, and Nevada Division of Emergency Management. FEMA and SPWD would implement Appendix C Treatment Measure A.1, recordation of the Marlette Lake Dam and its appurtenant features and North Canyon Road (North Section) through production of a digital photography package.

FEMA consulted with the SHPO on March 5, March 25, and April 16, 2024, recommending a Finding of Adverse Effect for the proposed action; proposing treatment or mitigation measures for resolving adverse effects to Marlette Lake Dam and North Canyon Road (North Section); outlining a phased identification and evaluation protocol for the Marlette Lake drawdown area; and proposed conditions governing construction-phase archaeological monitoring, protective measures, and reporting requirements. In an initial response on April 2, 2024, and a final response on May 16, 2024, the SHPO concurred with the Finding of Adverse Effect and the proposed mitigation measures, phased identification and evaluation protocol , and construction-phase conditions. Appendix A provides a non-confidential copy of relevant agency correspondence.

4.12. Environmental Justice

Environmental justice is defined by EO 12898 (59 Federal Register 7629) and Council on Environmental Quality (CEQ) guidance (1997). Under EO 12898, demographic information is used to determine whether minority or low-income populations are present within the areas potentially affected by the range of project alternatives. If so, a determination must be made whether implementation of the project alternatives may cause disproportionately high and adverse human health or environmental impacts on those populations.

The study area for the environmental justice analysis includes the project area, access routes, and staging areas, which span three census block groups (320310033102, 325100003002, 320050016002) in Washoe County, Carson City, and Douglas County. The three census block groups cover approximately 61 square miles and have a total population of approximately 2,200 residents. The study area represents the area where project-related impacts would occur, including noise, transportation, and water and air quality impacts, potentially causing disproportionately high and adverse effects on neighboring minority and low-income populations. For the purposes of this analysis, environmental justice populations are identified using demographic indicators and Environmental Justice (EJ) Indexes.

In accordance with the FEMA EO 12898 Environmental Justice: Interim Guidance for FEMA EHP Reviewers, environmental justice populations are defined under the following criteria:

- The minority or low-income population of the affected environment equals or exceeds the 50th percentile compared to the statewide average.

- One or more of the EJ Indexes in the affected environment equals or exceeds the 80th percentile compared to the statewide average.

Minority Populations: CEQ (1997) defines the term 'minority' as persons from any of the following groups: Black, Asian or Pacific Islander, American Indian or Alaskan Native, and Hispanic. According to EPA's Environmental Justice Screening and Mapping Tool (EJScreen), the study area is in the 32nd percentile in the state for minority populations (EPA 2024d). As such, the study area would not be considered to contain a minority population because it does not meet the percentile threshold listed above.

Low-Income Populations: Residents of areas with a high percentage of people living below the federal poverty level may be considered low-income populations. According to EJScreen, the study area is in the 22nd percentile in the state for low-income population (EPA 2024d). As such, the study area would not be considered to contain a low-income population because it does not meet the percentile threshold listed above.

EJ Index: **Table 4.7** depicts the EJ Indexes for the study area and identifies if environmental justice populations are present based on the criteria described above.

Table 4.7. Environmental Justice Indexes

EJ Index	Percentile in State	Environmental Justice Population Present?[1]
PM	9	No
Ozone	15	No
Diesel PM	10	No
Air Toxics Cancer Risk	6	No
Air Toxics Respiratory Hazard Index	11	No
Toxic Releases to Air	43	No
Traffic Proximity	26	No
Lead Paint	58	No
Superfund Proximity	69	No
Risk Management Plan Facility Proximity	9	No
Hazardous Waste Proximity	13	No
Underground Storage Tanks	29	No
Wastewater Discharge	16	No

Source: EPA 2024d

As presented in **Table 4.7**, the population of the census block groups that encompasses the project area do not meet the criteria listed above for environmental justice populations. Additionally, all of the EJ Indexes for the census block groups are below the 80th percentile compared to the statewide average (USEPA 2024d). Thus, environmental justice populations are not expected to be present in or near the project area. A review of aerial imagery and housing prices near the project area supports this determination.

4.12.1. NO ACTION ALTERNATIVE

Because there are no communities with minority and/or low-income populations present in or near the project area, there would be no short- or long-term disproportionately high and adverse impacts on environmental justice populations as a result of the no action alternative.

4.12.2. PROPOSED ACTION

Because there are no communities with minority and/or low-income populations present in or near the project area, there would be no short- or long-term disproportionately high and adverse impacts on environmental justice populations as a result of the proposed action.

4.13. Hazardous Materials

Hazardous materials are those substances defined by the Comprehensive Environmental Response, Compensation, and Liability Act, as amended by the Superfund Amendments and Reauthorization Act, and the Toxic Substances Control Act. The Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act, which was further amended by the Hazardous and Solid Waste amendments, defines hazardous wastes. In general, both hazardous materials and waste include substances that, because of their quantity, concentration, physical, chemical, or infectious characteristics, may present substantial danger to public health or to the environment when released or otherwise improperly managed.

Hazardous materials may be encountered during a project, or they may be generated by project activities. To determine whether any hazardous waste facilities exist in the vicinity or upgradient of the proposed project areas or whether there is a known and documented environmental issue or concern that could affect the proposed project area, a search for Superfund sites, toxic release inventory sites, water dischargers (i.e., municipal and industrial wastewater treatment facilities), hazardous facilities or sites, and multiactivity sites was conducted using EPA's NEPAssist website (EPA 2024e). According to the database, there are no known hazardous waste sites or materials in the project area.

4.13.1. NO ACTION ALTERNATIVE

Under the no action alternative, construction would not occur and there would be no short-term impacts related to hazardous materials either from the use of construction equipment or from the exposure of contaminated materials through ground-disturbing activities. In the long term, the risk of dam failure would not be reduced. As discussed in Section 4.3.1, in the event of a dam breach, high

flood flows in Marlette Creek could result in the rupture of a sewage effluent pipe under SR 28 and the discharge of treated effluent into Lake Tahoe. As discussed in Section 4.5.1, this discharge of nutrients could lead to algae growth and impact water quality; however, the materials that would be released do not meet the definition of "hazardous materials" under the laws cited in the previous section. Therefore, under this alternative there would be no potential for long-term production or exposure of hazardous wastes or materials. Therefore, this alternative would have no short- or long-term impacts related to hazardous materials.

4.13.2. PROPOSED ACTION

The proposed action would include the use of mechanical equipment, such as excavators and trucks, which could release fuels, oils, and lubricants through inadvertent leaks and spills. That risk would be mitigated using BMPs such as inspecting equipment before use and having materials on hand to properly clean up any potential leaks or spills. Although subsurface hazardous materials are not anticipated to be present, excavation activities could expose or otherwise affect previously undetected subsurface hazardous wastes or materials. Any hazardous materials discovered, generated, or used during implementation of the proposed action would be disposed of and handled in accordance with applicable local, state, and federal regulations. Therefore, there would be a negligible impact on hazardous materials in the short term.

The proposed action would have no long-term impacts on hazardous materials.

4.14. Noise

Sounds that disrupt normal activities or otherwise diminish the quality of the environment are considered noise. Noise events that occur during the night (10 p.m. to 7 a.m.) are more annoying than those that occur during normal waking hours (7 a.m. to 10 p.m.). Assessment of noise impacts includes the proximity of the proposed action to sensitive receptors. A sensitive receptor is an area of frequent human use that would benefit from a lowered noise level. Typical sensitive receptors include residences, schools, churches, hospitals, nursing homes, and libraries, none of which are present within the project area. The maximum Cumulative Noise Equivalent Level (CNEL) for Marlette Lake is 50 A-weighted decibels (dbA) and the CNEL for the Highway 28 Corridor is 55 dbA (TRPA 2021; TRPA 2023a). The maximum CNEL recorded in January 2019 for SR 28 was 57.3 dbA and US 50 was 59.1 dbA (TRPA 2023a).

As a result of the remote nature of the project area, there are no permanent sensitive receptors within 1 mile of the project area. Temporary seasonal cabin rentals and campgrounds would be closed during construction and permanent residences are limited because of the surrounding public land associated with the Lake Tahoe Nevada State Park. However, some nearby recreational areas would remain open for recreational hikers and bikers in the area.

4.14.1. NO ACTION ALTERNATIVE

Under the no action alternative, construction would not occur and there would be no noise associated with construction activities. Therefore, there would be no short-term impact on noise.

There would be no long-term effect related to noise because there would be no new permanent source of noise.

4.14.2. PROPOSED ACTION

Under the proposed action, construction would occur on weekdays from 7 a.m. to 6 p.m. In addition, to avoid traffic impacts, some material may be hauled to the dam at night. Vehicle and truck trips and the use of heavy machinery would increase noise levels in the area for the duration of construction. However, because of the remote nature of the project area and proposed closures, there are no permanent sensitive receptors near project construction. Visitors to other recreational areas nearby may experience a short-term increase in noise from construction. Therefore, the proposed action would have minor short-term noise impacts in the project area.

The proposed action would not result in long-term noise impacts because it would not include a permanent source for noise.

4.15. Transportation

Marlette Lake is accessed by North Canyon Road, which starts from the Spooner Lake Trail dirt road at Spooner Lake off SR 28, less than 1 mile north of US 50. The dam is accessed from North Canyon Road via the Flume Trail dirt road. North Canyon Road and the Flume Trail are all access roads that are closed to public vehicles.

As discussed in Section 4.3, SR 28 and US 50 makeup the Lake Tahoe – East Shore Drive, which is designated as a National Scenic Byway (Federal Highway Administration 2021). According to the Nevada Department of Transportation's (NDOT) Traffic Information System mapping software, the 2022 estimated average annual average daily traffic (AADT) for SR 28, 0.25 miles north of US 50, is 5,800 trips. The 2022 AADT for US 50, 0.3 miles south of the SR 28 intersection is 13,600 trips and 1.1 miles east of the intersection it is 14,800 trips (NDOT 2022). The level of service for the unsignalized US 50/SR 28 Intersection is "F," for failure; over 1,000-foot-long southbound SR 28 queues have been observed in the field at this intersection during peak times (NDOT 2021). Near the project area, SR 28 and US 50 have Present Serviceability Index scores of good (between 3.50 to 3.99) and fair (between 3.00 and 3.49) (NDOT 2020).

4.15.1. NO ACTION ALTERNATIVE

Under the no action alternative, there would be no construction equipment or personnel accessing the project area. Thus, there would be no short-term impact on traffic on surrounding roads.

In the long term, the risk of dam failure would not be reduced. In the event of a dam breach, there would be flooding and large amounts of debris, potentially undermining the stability of SR 28 and causing washouts or blocking the roadway. Inundation mapping prepared as a part of the Marlette Lake Dam Emergency Action Plan shows over 2,400 feet of SR 28 would be impacted by flood waters (SPWD 2014). Therefore, the no action alternative could have moderate to major long-term

impacts on transportation in the area depending on the severity of the damage resulting from a dam breach.

4.15.2. PROPOSED ACTION

Under the proposed action, construction would take place at Marlette Lake Dam and there would be traffic impacts from construction vehicles entering and exiting US 50 at Spooner Lake. It is expected that most import hauls to the dam site would take place over a 3-month period from mid-July through mid-September. During this time, it is estimated that approximately 37 truck trips per day would be required, with most trucks using US 50 to travel to and from Carson City. While there would be some additional construction traffic on the roadways surrounding the project area, increasing the number of trips in the area by approximately one percent, these impacts would be temporary and localized, affecting only a small number of roadways. In addition, to avoid traffic impacts, some material may be hauled to the dam at night. Equipment would be staged within the park in closed areas; therefore, it is not expected that road closures or detours would be required under this alternative. If it is determined that a temporary traffic control plan is required during construction, SPWD would coordinate with NDOT and obtain any permits necessary. Therefore, the proposed action is expected to have negligible short-term impacts on transportation.

The proposed action would reduce the risk of dam failure in the long term, which would prevent the potential flooding and destruction of SR 28 from erosive flows and debris. With a reduced risk of a dam breach, the modified dam would help protect SR 28 from road closures caused by flood damage associated with a dam breach. Therefore, the project would have a minor beneficial impact on transportation in the long term under this alternative.

4.16. Public Services, Utilities, and Recreation

The project is within the Spooner Lake and Backcountry, a Nevada State Park. Because of its remote location, utilities and facilities are limited. Marlette Lake has one vault restroom on the south side of the lake. North Canyon Campground offers visitors four primitive first-come, first-serve campsites off North Canyon Road, approximately 15 miles south of Marlette Lake. Amenities at the campground include a vault restroom, bear boxes, and fire rings. Drinking water in the project area must be collected and filtered from the lake or running streams (Nevada State Parks 2023a). The Spooner Lake Visitor Center and Amphitheater houses the park's natural and cultural history programs and outdoor science demonstrations for students and serves as the ranger station. Rangers offer led hikes and tours from this facility (Nevada State Parks 2023b). Spooner Lake is equipped with several restrooms, picnic tables, and potable water. Spooner Lake Cabin on the north side of Spooner Lake and Wildcat Cabin 2.5 miles up North Canyon Road from Spooner Lake are equipped with a composting toilet, cook stove, and wood-burning stove (Nevada State Parks 2023b). As discussed in Section 4.3, there are two trails near the project area, the Tahoe Rim Trail and the Flume Trail, used for hiking and mountain biking. NDOW manages Marlette Lake as a catch and release fishery, open to fishing from July 15th to September 30th, with a large stock of rainbow trout, brook trout, and LCT (NDOW 2023b). NDOW also manages Spooner Lake as a put and take fishery,

open to fishing year-round, and is stocked with rainbow trout, tui chub (*Siphateles bicolor*), and several sterile trout hybrids including bowcutt trout and tiger trout (NDOW 2023c).

Marlette Lake is part of the Marlette Lake Water System, which provides raw water to Carson City, Storey County, and Lyon County, and the Marlette Lake Water System is the only source of raw water for Virginia City. The Marlette Lake Water System and water supply are discussed further in Section 4.5. There are no other utilities in the project area.

4.16.1. NO ACTION ALTERNATIVE

Under this alternative there would be no construction and no short-term impacts on utilities, public services, or recreation.

In the long term, the risk of dam failure would not be reduced. A dam breach would cause substantial damage to the dam itself and the Flume Trail immediately downstream of the dam. Access to the dam, Flume Trail, and Marlette Lake would be restricted while any needed repairs are completed. In addition, the extensive loss of aquatic life and smaller lake size would limit the ability to fish in Marlette Lake. As discussed in Section 4.5, water supply would also be impacted by a dam breach, as the delivery of raw water to Carson City and areas of Storey County and Lyon County would be greatly reduced. Although Marlette Lake is not the only source of water for the Marlette Lake Water System, it is a substantial proportion of the water supply. Therefore, there could be minor long-term adverse impacts on recreation and moderate long-term adverse impacts on public services and utilities depending on the severity of the loss of lake storage volume resulting from the dam breach.

4.16.2. PROPOSED ACTION

Construction of the proposed action would require the temporary closure of the area around Marlette Lake Dam and North Canyon Road for the transportation of personnel and equipment from SR 28, which would limit public access to recreation in the area from Spring 2025 through Summer 2026. Closures would include North Canyon Campground and Wildcat Cabin, and Marlette Lake would be closed to fishing. Signage would be placed along the Flume Trail directing visitors around the construction area using alternate existing trails, maintaining limited rerouted hiking and mountain biking opportunities during construction. These temporary disruptions would be mitigated through public notification and outreach. In addition, there are numerous alternate recreation areas throughout the Lake Tahoe region that would remain open during the temporary closure, including the Spooner Lake Visitor Center and Spooner Lake. As discussed in Section 4.5, the drawdown during construction of the proposed action would limit the ability to divert water from Marlette Lake into the Marlette Lake Water System during construction and the following 6 years while the lake naturally refills. Carson City and areas of Storey County and Lyon County would instead need to temporarily rely on alternate raw water sources, including the other components of the Marlette Lake Water System. Therefore, there would be a moderate impact on recreation and public services and utilities in the short term.

In the long term, the risk of dam failure would be reduced under this alternative and unplanned adverse impacts on recreation in the area would be less likely. With a reduced risk of a dam breach, the modified dam would help prevent future long-term recreation closures within the project area. The modified dam would also help protect the delivery of raw water to Carson City and areas of Storey County and Lyon County. Therefore, the project would have a minor beneficial impact on recreation and a moderate beneficial impact on public services and utilities in the long term under this alternative.

4.17. Public Health and Safety

The closest emergency services provider to the project area is Douglas County Fire Station 25, located 4 miles and approximately 6 minutes from Spooner Lake. Because of the remote nature of the project area, backcountry emergency response is often a multi-agency operation, including search and rescue teams from the Carson City, Washoe County, and Douglas County Sheriff's Offices. The nearest hospital by car is Incline Village Community Hospital (880 Alder Avenue), approximately 12 miles from Spooner Lake. Barton Memorial Hospital (2170 South Avenue) in South Lake Tahoe and Carson Tahoe Regional Medical Center (1600 Medical Parkway) in Carson City are both equipped with helicopter pads.

The Marlette Lake Dam Emergency Action Plan is in place for Marlette Lake Dam failure scenarios. Once Washoe County Emergency Dispatch is notified of the condition of the dam, they are responsible for contacting local authorities for action. The Washoe County sheriff and police are responsible for evacuation of the inundation area; Nevada State Parks is responsible for the evacuation of the backcountry areas along the Flume Trail and trails into Marlette Lake; Nevada Highway Patrol is responsible for evacuating and blocking SR 28 (SPWD 2014).

4.17.1. NO ACTION ALTERNATIVE

Under the no action alternative, construction at Marlette Lake Dam would not occur and there would be no short-term impacts on health and safety.

In the long term, the risk of dam failure would not be reduced. In the event of dam failure, the Flume Trail, SR 28, and the shores of Lake Tahoe would be inundated with water and debris moving at extremely high velocities. Depending on the timing of the dam breach, recreationists could be on the trail or at the beach and there could be travelers along SR 28 in the path of inundation. In addition, if SR 28 were closed because of the dam breach, there are limited alternate routes in the area and emergency responders would need to detour or use a helicopter to bypass the damaged section, increasing emergency response times. For example, the travel time from Spooner Lake to the nearest hospital in Incline Village is approximately 19 minutes while the travel time to the hospital in Carson City (without the use of a helicopter) is 25 minutes. Therefore, the no action alternative could have moderate to major long-term impacts on public health and safety depending on the timing and severity of the damage resulting from a dam breach.

4.17.2. PROPOSED ACTION

Under the proposed action, the Flume Trail would be closed during construction to keep the public out of work zones. Visitors to the area would be informed of trail closures through public outreach and signage. As discussed in Section 4.15, the proposed action would not require any road closures or detours and would have no impact on emergency access through the area. Therefore, there would be a negligible short-term adverse impact on public health and safety.

The proposed action would reduce the risk of dam failure in the long term, which would help prevent the potential inundation and damage of trails, beaches, and SR 28 with flows and debris. With a reduced risk of a dam breach, the modified dam would help protect people downstream of the dam. The proposed action would also help protect SR 28 for emergency access. Therefore, the proposed action would have a moderate beneficial impact on public health and safety in the long term.

4.18. Summary of Effects and Mitigation

Table 4.8 provides a summary of the potential environmental effects from implementation of the proposed action, any required agency coordination efforts or permits, and any applicable proposed mitigation or BMPs.

Table 4.8. Summary of Impacts and Mitigation

Affected Resource Area	Impacts	Agency Coordination or Permits	Mitigation/BMPs
Geology, Topography, and Soils	Minor short-term adverse impacts on geology, topography, and soils; minor long-term benefit.	Not applicable (N/A)	BMPs to control erosion and sediment runoff.
Visual Quality and Aesthetics	Minor short-term adverse impact on visual quality and aesthetics; minor long-term benefit.	N/A	N/A
Air Quality	Construction would have minor short-term adverse impacts on air quality; no long-term adverse impact.	Washoe County: Dust Control Permit Authority to Construct	All construction equipment would be required to meet current EPA emissions standards. Areas of exposed soil would be covered or wetted to reduce fugitive dust. Vehicle and equipment run times would be kept to a minimum.

Affected Resource Area	Impacts	Agency Coordination or Permits	Mitigation/BMPs
Water Quality and Water Supply	Water Quality - Minor short-term adverse impacts; moderate beneficial long-term impacts. Water Supply - Moderate short-term impacts; moderate beneficial long-term impacts.	Section 404 permit - USACE; National Pollutant Discharge Elimination System, construction stormwater general permit - Nevada Division of Environmental Protection	Erosion control BMPs. Project-specific Stormwater Pollution Prevention Plan would be prepared.
Wetlands	Moderate short-term adverse impacts on wetlands; minor adverse and minor beneficial long-term impacts.	N/A	Tightly woven fiber netting, plastic monofilament netting, or similar material would not be used for erosion control or other purposes adjacent to aquatic resources, including wetlands.
Floodplains	Minor short-term adverse impacts on floodplains; minor beneficial long-term impacts.	N/A	N/A
Vegetation and Invasive Species	Vegetation - Negligible short-term adverse impacts from removing vegetation; minor beneficial long-term impact. Invasive species - Negligible short-term adverse impacts; minor to moderate adverse long-term impact.	N/A	All construction equipment and vehicles would be washed and inspected for weed seeds and plant parts prior to bringing them onto the property. Vehicles or other traffic that may transport weed seed or plant materials would be restricted from entering the site. Weed-free mulch would be used for all site restoration areas. Infestations of invasive plants that are discovered during project implementation would be documented, locations mapped, and avoided.

Affected Resource Area	Impacts	Agency Coordination or Permits	Mitigation/BMPs
Fish and Wildlife	Terrestrial Wildlife - Minor short-term adverse impacts; negligible long-term adverse impacts. Aquatic Life - Moderate short-term adverse impacts; moderate long-term beneficial impacts. Migratory Birds - minor short- and long-term adverse impacts. Eagles - No to minor short- and no long-term adverse impacts.	Incidental Take Permit (Bald and Golden Eagle Protection Act) - USFWS/NDOW (if needed)	If vegetation removal is scheduled during the nesting season (March 1 to August 31), a focused survey for nests would be completed by a qualified wildlife biologist at a minimum radius of 500 feet for migratory birds and a 0.5-mile radius for raptors around the project area. If active nests are found, the nest would be avoided, and a disturbance buffer would be established by the project biologist in coordination with NDOW. A screen-covered drafting box would be used while drafting or dewatering to minimize removal of aquatic species, including juvenile fish, from aquatic habitats. Pump intake screens would be sized according to the pump intake capacity and approved by an NDOW fisheries biologist. NDOW would perform any fish salvage procedures necessary prior to and/or during the dewatering of the waterward side of the dam.
Threatened and Endangered Species	Moderate short-term adverse impact on threatened and endangered species; moderate long-term benefit. The proposed action may affect and would likely adversely affect LCT.	USFWS Formal Consultation	Implementation of BMPs, specific measures for LCT, and reasonable and prudent measures identified during formal consultation with USFWS.

Affected Resource Area	Impacts	Agency Coordination or Permits	Mitigation/BMPs
Cultural Resources	Adverse effect to historic properties, resolved through mitigation.	Nevada SHPO	Digital photography package to mitigate adverse effects to Marlette Lake Dam and North Canyon Road (North Section); a phased identification and evaluation protocol for the Marlette Lake drawdown area; and proposed conditions governing construction-phase archaeological monitoring, protective measures, and reporting requirements. These measures are listed in Appendix A, Agency Correspondence.
Environmental Justice	No short- or long-term environmental justice impacts.	N/A	N/A
Hazardous Materials	Negligible short-term adverse impacts related to hazardous materials; no long-term adverse impacts.	N/A	Equipment would be kept in good condition. Any spills or leaks from equipment would be contained and cleaned up right away. All equipment and project activities would adhere to local regulations to reduce the risk of hazardous leaks and spills.
Noise	Minor adverse impacts from increased noise during construction within the project area; no long-term adverse impacts.	N/A	All construction equipment would be well maintained, have sound-control devices no less effective than those provided on the original equipment, and have muffled exhaust.
Transportation	Construction would have minor short-term adverse impacts on transportation; minor long-term benefits.	Coordinate with NDOT to obtain necessary permits.	N/A

Affected Resource Area	Impacts	Agency Coordination or Permits	Mitigation/BMPs
Public Services and Recreation	Moderate short-term adverse impact on recreation; minor long-term benefits. Moderate short-term impact on public services; moderate long-term beneficial effect.	N/A	Information related to closures would be posted and shared through public notification and outreach.
Public Health and Safety	Negligible short-term adverse impacts on public health and safety; moderate long-term benefits.	N/A	N/A

SECTION 5. Cumulative Impacts

This section addresses the potential cumulative impacts associated with the implementation of the proposed action. Cumulative impacts can be defined as the impacts of a proposed action when combined with impacts of past, present, or reasonably foreseeable future actions undertaken by any agency or person. CEQ's regulations for implementing NEPA require an assessment of cumulative effects during the decision-making process for federal projects. Cumulative impacts can result from individually minor but collectively significant actions.

Similar to the proposed Marlette Lake Dam Resilient Infrastructure Project, SPWD is proposing the Hobart Creek Reservoir Dam Resilient Infrastructure Project to improve the resilience of the Hobart Creek Reservoir Dam. The project would include improvements to the dam's structure, spillway, and associated components (FEMA 2023b). The Hobart Creek Reservoir Dam is also part of the Marlette Lake Water System and provides water to the same jurisdictions as Marlette Lake, including Carson City, Storey County, and Lyon County. The Hobart Creek Reservoir Dam Resilient Infrastructure Project is currently in the initial stage of design. As currently planned, construction and drawdown related to the Hobart Creek Reservoir Dam Resilient Infrastructure Project would be scheduled to not coincide with the construction and drawdown related the Marlette Lake Dam Resilient Infrastructure Project.

The Marlette Summit Hazardous Fuels Reduction Project is a 420- to 452-acre fuel reduction project within Lake Tahoe Nevada State Park near the proposed action. One of the treatment areas is directly south of Marlette Lake Dam and Marlette Creek and west of Marlette Lake. The other treatment area is directly west of North Canyon Road. The treatment areas would help prevent wildland fire from progressing from the south and west to the east, upslope to the Marlette Lake basin. This project would connect a large contiguous area where hazardous fuel reduction has been completed in the past. The project is expected to include 100 acres of hand thinning vegetation and 100 acres of prescribed burning over 3 years, beginning in 2024 (TRPA 2023b).

The proposed action would result in short-term moderate adverse impacts on water supply, wetlands, aquatic wildlife, threatened and endangered species, recreation, and public services. The proposed action would result in short-term negligible to minor adverse impacts on topography and soils, visual resources, air quality, water quality, floodplains, vegetation, terrestrial wildlife, migratory birds and eagles, hazardous materials, noise, transportation, and public health and safety. The proposed action would result in negligible to moderate long-term benefits on topography and soils, visual resources, water quality, wetlands, floodplains, vegetation and invasive species, aquatic life, threatened and endangered species, transportation, public services and recreation, and public health and safety. The proposed action would also result in an adverse effect to historic properties, which would be resolved through mitigation.

The Hobart Creek Reservoir Dam Resilient Infrastructure Project, when combined with the proposed action, would not have construction-related cumulative impacts because construction of the two projects would not occur at the same time. However, the Hobart Creek Reservoir Dam Resilient

Infrastructure Project would include the modification of potentially historic properties that may be contributing elements to the Marlette Lake Water System, similar to the modification of Marlette Lake Dam, which could result in cumulatively considerable impacts on cultural resources. Prior to construction of the Hobart Creek Reservoir Dam Resilient Infrastructure Project, SPWD would consult with the SHPO and implement mitigation measures to resolve any adverse effect to historic properties. Therefore, there would be no cumulative impact on cultural resources.

The Marlette Summit Hazardous Fuels Reduction Project could occur nearby and during the same time as the proposed action, which would result in negligible to minor short-term adverse cumulative impacts associated with implementation of both projects. Thus, the fuels reduction activities associated with the Marlette Summit Hazardous Fuels Reduction Project, when combined with the proposed action, would result in minor short-term cumulative adverse impacts on visual resources, air quality, transportation, hazardous materials, and noise due to the presence and operation of equipment in the same area. In addition, the Marlette Summit Hazardous Fuels Reduction Project would result in negligible to minor short-term cumulative adverse impacts on water quality, vegetation, terrestrial and aquatic environments, public services and recreation, and public health and safety when combined with the proposed action. Both projects would implement BMPs and mitigation measures to reduce impacts to the maximum extent practicable. In addition, implementation of both projects at the same time would reduce the duration of these impacts within the area and the Marlette Summit Hazardous Fuels Reduction Project could benefit from the temporary closure of recreational areas associated with the proposed action. In the long-term, both projects would reduce hazards in the area, having a beneficial cumulative impact.

SECTION 6. Agency Coordination, Public Involvement and Permits

This section provides a summary of the agency coordination efforts and public involvement process for the proposed Marlette Lake Dam Resilient Infrastructure Project. In addition, an overview of the permits that would be required under the proposed action is included.

6.1. Agency Coordination

On April 21, 2022, FEMA initiated consultation with nine tribes and two historical societies about the action alternatives to solicit comments and request any additional information about cultural resources that may be impacted by the action alternatives. Tribes contacted included the Confederated Tribes of the Warm Springs Reservation of Oregon; Fort McDermitt Paiute and Shoshone Tribes of the Fort McDermitt Indian Reservation; Paiute-Shoshone Tribe of the Fallon Reservation and Colony; Pyramid Lake Paiute Tribe of the Pyramid Lake Reservation; Reno-Sparks Indian Colony; Walker River Paiute Tribe of the Walker River Reservation; Washoe Tribe of Nevada and California; and Yerington Paiute Tribe of the Yerington Colony & Campbell Ranch. The two historical societies contacted included the Nevada Historical Society and the Carson City Historical Society. Patrick Burtt, Tribal Historic Preservation Officer for the Washoe Tribe of California and Nevada (Washoe Tribe), expressed interest in being a consulting party in discussions with FEMA. FEMA is continuing to consult with the tribes, including the Washoe Tribe.

FEMA consulted with the SHPO on March 5, March 25, and April 16, 2024, recommending a Finding of Adverse Effect for the proposed action; proposing treatment or mitigation measures for resolving adverse effects to Marlette Lake Dam and a portion of North Canyon Road (North Section); outlining a phased identification and evaluation protocol for the Marlette Lake drawdown area; and proposed conditions governing construction-phase archaeological monitoring, protective measures, and reporting requirements. In an initial response on April 2, 2024, and a final response on May 16, 2024, the SHPO concurred with the Finding of Adverse Effect and the proposed mitigation measures, phased identification and evaluation protocol, and construction-phase conditions. Appendix A provides a non-confidential copy of agency correspondence outlining the mitigation measures, phased protocol, and construction-phase conditions to be implemented as part of the project.

Formal consultation with USFWS was completed on December 28, 2023; USFWS issued a biological opinion (File Number 2022-0079054) with the determination that the proposed action may affect, and is likely to adversely affect the LCT. Appendix A provides a copy of relevant agency correspondence.

6.2. Public Participation

In accordance with NEPA, this draft EA will be released to the public, tribes, and resource agencies for a 30-day public review and comment period. Comments on this draft EA will be incorporated into the final EA, as appropriate. This draft EA reflects the evaluation and assessment of the federal

government, the decision-maker for the federal action; however, FEMA will consider any substantive comments received during the public review period to inform the final decision regarding grant approval and project implementation. If no substantive comments are received from the public or agency reviewers, this draft EA will be assumed to be final and a FONSI will be issued by FEMA.

A public scoping notice and fact sheet about the project action was published on FEMA's website (https://www.fema.gov/sites/default/files/documents/fema_fact-sheet-marlette-lake-dam_082022.pdf) on August 9, 2022, and in the local newspaper (*Reno Gazette-Journal*) on August 24, 2022, to notify and provide the public with an opportunity to comment on the proposed action, potential alternatives, and preliminary identification of environmental issues. The public comment period on the public notice closed on September 8, 2022. FEMA and SPWD did not receive any comments.

The draft EA will be available to the public for review on FEMA's website at: https://www.fema.gov/emergency-managers/practitioners/environmental-historic/nepa-repository. SPWD will make the draft EA available on its website at: https://publicworks.nv.gov/Documents/SPWD_Documents/. Hard copies of the draft EA will be made available at the State Public Works Office Reception Lobby, 680 W. Nye Lane, Suite 103, Carson City, Nevada. The comment period for the draft EA will start when the public notice of EA availability is published and will extend for 30 days. Comments on the draft EA may be submitted to fema-rix-ehp-documents@fema.dhs.gov (include "Marlette Dam" in the subject line). Comments also may be submitted via mail to:

Aaron Clark
Acting Regional Environmental Officer
FEMA Region 9
1111 Broadway, Suite 1200
Oakland, CA 94607-4052

6.3. Permits

SPWD would be responsible for obtaining any necessary local, state, or federal permits needed to conduct the proposed work.

SECTION 7. List of Preparers

The following is a list of preparers who contributed to the development of the Marlette Lake Dam Resilient Infrastructure Project draft EA for FEMA. The individuals listed below had principal roles in the preparation of this document. Many others contributed, including senior managers, administrative support personnel, and technical staff, and their efforts in developing this EA are appreciated.

Federal Emergency Management Agency

Reviewers	Role in Preparation
Holm, Lisa	NHPA/SHPO Consultation, Technical Review and Approval
Roberts, Lisa	ESA/Biological Assessment

CDM Smith

Preparers	Experience and Expertise	Role in Preparation
Fogler, Wilson	Biologist	NEPA Documentation
Gledhill, Greta	Environmental Planner	NEPA Documentation
Lea, Claudia PE, PMP	Project Manager	Project Manager
Quan, Jenna	Environmental Planner	NEPA Documentation
Shepherd, Brian	Geographic Information System Specialist	Figure Development
Stenberg, Kate PhD	Senior Environmental Planner	Quality Control/Technical Review
Woodruff, Abbie	Environmental Planner	NEPA Documentation

This document was prepared by CDM Smith under Contract No.: 70FA6020D00000002, Task Order: 70FA6021F00000053.

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Appendix A

Agency Correspondence

U.S. Department of Homeland Security
Region IX
1111 Broadway, Suite 1200
Oakland, CA 94607-4052

FEMA

IN REPLY REFER TO:
JC-PDMC-PJ-09-NV-2018-001

March 5, 2024

Rebecca Palmer
Nevada State Historic Preservation Officer
State Historic Preservation Office
901 South Stewart Street, Suite 5004
Carson City, NV 89701

Re: Section 106 Continuing Consultation
PDMC-PJ-09-NV-2018-001
Project: Marlette Lake Dam Resilient Infrastructure Project
Subapplicant: Nevada State Public Works Division
Determination: No Adverse Effect (with Conditions)

Dear Ms. Palmer:

The Federal Emergency Management Agency (FEMA) of the U.S. Department of Homeland Security proposes to provide federal financial assistance to the Nevada State Public Works Division (SPWD or Subapplicant) to stabilize the Marlette Lake Dam to reduce hazards from seismic events. The project will be funded under FEMA's Pre-Disaster Mitigation Competitive (PDMC) grant program, and the funds will be administered through the Nevada Division of Emergency Management (NDEM or Applicant). The Marlette Lake Dam and reservoir are contributing elements to the Marlette Lake Water System, which was listed in the National Register of Historic Places (NRHP) as a District in 1992 (NR#920001162) and designated a National Historic Civil Engineering Landmark by the American Society of Civil Engineers in 1975.

On July 26, 2023, FEMA sent a letter to your office requesting your review and approval of proposed archaeological and historic architectural identification and evaluation efforts in support of FEMA's compliance with Section 106 of the National Historic Preservation Act (NHPA). By letter dated August 14, 2023, your office agreed with FEMA's approach to identification and evaluation, including the testing of archaeological sites though the excavation of test units and artifact analysis. This letter describes the results of those efforts and provides the ninety-percent engineering design plans.

With these new data, FEMA is requesting continuing consultation with your office on the proposed Undertaking pursuant to the 2023 Programmatic Agreement (Agreement) among FEMA, the Nevada State Historic Preservation Officer (SHPO), and NDEM. FEMA has reviewed the proposed Undertaking in accordance with the Agreement and respectfully requests your review of FEMA's finding of **No Adverse Effect (with Conditions)**.

Project Location

Marlette Lake Dam is an earthen-filled dam located along Marlette Creek in Washoe County on the east side of the Lake Tahoe basin (39.172864, -119.907403). The dam is part of the historic Marlette Lake Water System, a National Register Historic District (NR#920001162) and National Civil Engineering Landmark. Originally developed in the 1870's, the system supplies water to Virginia City, Silver City, Gold Hill, and Carson City. The system includes Marlette Lake, Hobart Reservoir, and a system of flumes and pipelines that transport an average of 16,925-acre feet/year of water. **Attachment 1** contains project location maps.

Undertaking

The Marlette Lake Dam is owned by the State of Nevada and is part of the Lake Tahoe-Nevada State Park in the Lake Tahoe Basin. Located in an area of high seismic hazard, the dam is classified as a "High Hazard Dam" in the National Inventory of Dams maintained by the U.S. Army Corps of Engineers. It was originally constructed beginning in 1873 and consists of an earthen-filled dam that retains Marlette Creek. It has been modified twice, most recently in 1959 to raise the height of the dam. The current dam is approximately 52-feet high, with a crest length of approximately 250-feet and a width of approximately 13-feet at the dam crest. The reservoir created by the dam has a storage capacity of roughly 11,780 acre-feet of water. There is one concrete lined spillway on the north side of the dam and one outlet pipe with a manual control on the top of the dam. The spillway discharges to Marlette Creek, which flows under State Route 28 via an existing box culvert and then to Lake Tahoe. The outlet pipe historically discharged to a flume that moved water to Virginia City and Carson City via a tunnel through the mountain. After a cave-in at the tunnel, the flume was abandoned, and the outlet pipe now discharges to Marlette Creek.

The ninety-percent design for the project calls for (1) stabilizing the existing dam embankment structure; (2) replacing the emergency spillway; (3) improving operational outlets; and (4) raising the access road adjacent to the dam. Stabilizing the existing structure would involve enlarging the downstream embankment with imported fill material for lateral support and establishing a two-stage toe drain, which would extend the toe of the dam an additional 48 feet. The dam height would be raised approximately 3 feet to address freeboard deficiencies. The existing concrete spillway would be removed and replaced with a new concrete box culvert and spillway. The existing primary outlet piping within the dam, which is currently corroding, would be replaced with new outlet pipe via open cut excavation. Marlette Creek would be re-graded at the outlet and a riprap stilling basin constructed. A 10-foot by 10-foot masonry building would be constructed on the dam crest to house new controls for the outlet piping. Design drawings for the project are included as **Attachment 2**. Contemporary and historical photographs of the project area are included as **Attachment 3**.

Dewatering and Cofferdam Installation and Removal

The work of replacing the outlet pipe would require dewatering Marlette Lake reservoir to approximately 22 feet below the spillway crest. The lake would be lowered using the existing

primary outlet, with a proposed maximum release of 25-cubic-feet per second (cfs) discharge to protect downstream habitat along Marlette Creek.

Drawdown of the reservoir would occur over the course of several months, with a proposed start date in September 2024, and dewatering measures would use existing facilities. Water releases would be limited to flows less than or equal to downstream conveyance system capacities, thus the existing water system and Marlette Creek are not expected to be impacted by the proposed drawdown. The drawdown is expected to be completed by the Spring of 2025. Riprap would be placed along the upstream crest of the dam and the embankment between the lake and the Tahoe Flume Trail to control for erosion. After construction, the reservoir would be allowed to recharge naturally.

Access Roads

Construction equipment would access the dam using North Canyon Road, a 15-foot-wide access road that runs south to north from Spooner Lake off State Route 28 near the intersection of US 50 (Lincoln Highway). At the south end of Marlette Lake, North Canyon Road transitions into the Tahoe Flume Trail, a gravel access road to the dam site. Use of North Canyon Road for access would require some tree and brush trimming and the improvement of several pullouts. A section of the Tahoe Flume Trail northeast of the dam site would be re-graded and raised approximately 5 feet to accommodate a temporary truck turnaround. During project construction, North Canyon Road would be temporarily closed to the public for safety considerations. Following construction, the road would be restored to pre-project conditions, including the repair of any damaged culvert crossings.

Area of Potential Effect

As defined in 36 CFR §800.16(d), the Area of Potential Effect (APE) is the geographic area or areas within which an undertaking may directly or indirectly cause changes in the character or use of historic properties. This includes (a) the proposed work areas centered on the Marlette Lake Dam; (b) parking, storage, and staging areas; (c) pullouts; (d) access roads; (e) and the proposed lake drawdown area. Maps of the APE are included in **Attachment 1**.

The vertical APE, or the depth of proposed ground disturbing activities, is expected to range from up to (a) 7 feet to replace weathered material along Marlette Lake Dam with imported fill material; (b) 7 feet to replace the existing concrete emergency spillway with the new concrete box culvert; (c) 12 inches for grading and vegetation clearance along the Tahoe Flume Trail adjacent to the dam; and (d) 4 feet for grading at the creek outlet to construct the riprap stilling basin. A trench would be cut, bisecting the middle of the dam, to a depth of approximately 50 feet to access the existing outlet pipes running through the bottom of the dam. Staging and construction access are expected to result in minimal or no ground disturbance, as North Canyon Road is maintained and of sufficient width to allow equipment access.

Project activities having the potential to temporarily effect historic properties directly or indirectly, including visual, audible, and atmospheric effects, would be minimized through

various control measures, including water spraying (for controlling dust emissions) and boundary fencing (for cultural resources). The final APE, presented here and depicted in **Attachment 1**, matches the APE presented in FEMA's June 26, 2023, consultation letter, incorporating SHPO's comments to include the slender corridor between North Canyon Road and the lakeshore within the APE.

In accordance with Stipulation II.C.2 of the Agreement, FEMA is requesting your comments on, or concurrence with, the proposed APE.

Identification and Evaluation of Historic Properties

In accordance with Stipulation II.C.3 of the Agreement, FEMA SOI-qualified archaeologist Jakob Crockett consulted FEMA's June 26, 2023, consultation letter to SHPO, photographs, maps, findings from a built environment survey, findings from a Phase 1 archaeology survey, and Nevada Cultural Resource Information System (NVCRIS) records to identify historic properties within the APE and project vicinity. FEMA has determined that there are four (4) properties listed or eligible for listing on the NRHP within the APE and that the APE is within a National Register Historic District (NR#920001162).

In 2021, Far Western Archaeological Research Group, Inc. (FWARG) and JRP Historical Consulting, LLC (JRP) completed initial cultural resource studies on behalf of SPWD under contract to Lumos & Associates to support the initial design of the project. Following further review by SPWD, FWARG conducted additional fieldwork, including intensive surface resurvey and mapping in July 2023 and subsurface testing in September 2023 at four resources (26DO643, 26OR343, 26OR348, 26OR359). In correspondence dated August 14, 2023, SHPO concurred with FEMA's determination that FWARG's testing plan, "Research Design and Work Plan for Evaluation of Four Archaeological Resources at Lake Tahoe Nevada State Park (July 2023)", does not exceed the level of effort needed characterize the integrity and data potential of the sites. FWARG's report detailing the results of their investigation is included in **Attachment 4**; JRP's report on built environmental resources within the APE is included in **Attachment 5**.

Archaeology

In the fall of 2023, FWARG carried out limited archaeological test excavations at four (4) previously recorded sites: 26DO311 (precontact lithic scatter), 26OR335 and OR345 (overseas Chinese camp with two loci), and 26WA2811/6930 (Marlette Station). The evaluations included intensive surface surveys and metal detection, surface sampling of artifact concentrations and refuse dumps, surface scrapes, and shallow test units.

Site 26DO311 was recorded in 1979 as lying adjacent to the Spooner Lake spillway and therefore within the current project APE. The 1979 investigation reported a small scatter of approximately 12 flaked stone tools and flakes adjacent to the Spooner Lake spillway. However, the site could not be relocated during several attempts by FWARG in 2000, 2021, and 2023 (see **Attachment 4**). There are no visible surface remains, and two shallow test units excavated within the APE, measuring 1.0-meter by 0.5-meter and extending 20-centimeters below surface, yielded no cultural material of any kind. Site 26DO311 is therefore not eligible for NRHP listing.

Investigations at sites 26OR335 and 26OR345 suggest that these are actually two loci of one site, an overseas Chinese camp and associated animal husbandry area, immediately adjacent to North Canyon Road. The original site sketch map indicated that 26OR335 (now Locus 1) extended into and just across the roadway, but the 2023 surface investigations and the excavation of two shovel test units, each measuring 1.0-meter by 0.5-meter and extending 20-centemeters below surface, on the other side of the road did not identify any artifacts or features proximate to the roadway. The combined site appears eligible as a contributing element of the National Register-listed Marlette Lake Water System (Criterion A) and for its demonstrated potential to add to our knowledge of overseas Chinese workers during the Comstock era (Criterion D). Neither 26OR335 (Locus 1) nor 26OR345 (Locus 2) are within the APE (see **Attachment 1** for maps). Both loci will be protected with temporary fencing and subject to archaeological monitoring (see Project Conditions below). Original and updated IMAC forms are included in FWARG's report in **Attachment 4**.

Archival research and oral histories indicate that Marlette Station (26WA2811/6930) was occupied from the 1870s to the 1960s. The first "occupants" probably were the work crews that built the original dam and access road in the 1870s, followed by a series of caretakers or flume/dam tenders. Artifacts inventoried at the site, dominated by domestic refuse, confirm this long span of site use. Archaeological investigations determined that Marlette Station is a complex of five (5) loci associated with the living and working quarters of a caretaker who oversaw the dam and flume that carried water from the lake to Spooner Summit. Nine (9) shovel scrapes (SS) or surface sampling units (SSU) were excavated across the five loci, within and adjacent to the APE. Shovel scrapes measured 2.0-meters by 2.0-meters and extended 5 to 10-centimeters below surface. Surface sampling units, used to inventory items in dense historic-period refuse concentrations, measured 1.0-meter by 1.0-meter and ended at the bottom of the deposits, which varied in depth. Combined with written, photographic, and oral-history data, the results suggest that each locus was associated with the activities of the caretaker, including the location of the cabin (Locus 3), a stable/barn (Locus 4), a blacksmith facility (Locus 2), and a refuse "dump" (Locus 5). Locus 1 cannot be positively identified for functional type with available data.

Marlette Station is clearly and directly associated with the Marlette Lake Water System and its early development, and is therefore recommended as a contributing element of that property under Criterion A. The site retains identifiable activity loci that reflect the layout of Marlette Station, as well as a relatively dense accumulation of artifacts dating to the period of occupation. FWARG suggests that additional excavations at the site would likely yield more personal and domestic items to address questions of household composition (and perhaps ethnicity), and more artifacts related to work and industry (blacksmithing, animal husbandry). Because of the apparent lack of written material on Marlette Station, these archaeological remains may be the only source of such data. The site is therefore recommended eligible under Criterion D as a contributing element of the Marlette Lake Water System National Register property.

Through intensive mapping and subsurface testing, FWARG was able to delineate the boundaries of all five (5) loci and determine that none of the loci overlap with proposed project activity areas (see **Attachment 1**). To ensure archaeological resources are protected from

inadvertent impacts during project work, each of the five (5) loci will be protected with temporary fencing and subject to archaeological monitoring (see Project Conditions below).

Table 1. Archaeology Determinations of Effect Summary.

Resource	Nevada Site No.	NHRP Eligibility	Adverse Effect
Pre-Contact Lithic Scatter	26DO311	Not Eligible	No
Overseas Chinese Camp Site	26OR335/345	Eligible, Criterion D	No
Marlette Station	26WA2811/6930	Eligible, Criterion D	No

In summary, the project would not have an adverse effect on any known archaeological resources within, or in close proximity to, the APE.

Built Environment

Following initial fieldwork during June 2021, JRP conducted additional field surveys during October 2022 to record and photograph the segments of the Tunnel Creek Flume, Marlette Lake to Highway 28 Road, Reservoir Intake Ditch, Reservoir Outlet Dich, South Ditch, and Marlette Lake Dam that are located within the APE. Table 2 provides a summary of these resources, their NHRP eligibility, and the potential for adverse effects. JRP's 2021 and the FWARG/JRP 2021 initial survey report were provided to SHPO as part of FEMA's June 26, 2023, letter and thus are not reproduced here.

Marlette Dam (26OR393/WA6931) is a combination stone masonry and earthen embankment dam that impounds water from Marlette Creek and other tributaries to form Marlette Lake. The dam is located at the end of North Canyon Road within an inlet on the west side of the reservoir and has a roughly east-west alignment. The dam was originally built in 1873 and enlarged in 1875 as a stone masonry structure, but this component has been nearly completely buried by the earthen embankment structure, which was built in 1959. A roughly 100-foot-long portion of the earlier stone masonry structure is visible on the downslope (south) side of the embankment, approximately 36-feet below the current crest of the dam. The old dam remnant is a slightly curved wall of unmortared stacked stone. The wall ranges from three to six courses and 3 to 4 feet in height. Attached to the west end of the earth embankment dam is a concrete spillway that also was built in 1959.

Although Marlette Dam was listed in the National Register in 1992 as a contributing feature of the eligible Marlette Lake Water System with a period of significance of 1872 to 1887, JRP concludes that Marlette Dam has been so substantially modified that it does not possess integrity to its nineteenth century appearance. While the dam does retain integrity of location and a high degree of setting, feeling, and association, substantial changes to the structure itself have significantly altered the integrity of design, workmanship, and materials. These changes have compromised the dam's integrity to the Marlette Lake Water System period of significance, and therefore it is not eligible as a contributor to the larger historic property. For all intents and purposes, Marlette Dam, and the system it serves, are products of the mid-twentieth century and represent the second generation of water supply development for the region. Based on JRP's research, the Marlette dam in its current configuration represents an expansion and continuation

of the pioneering efforts to develop and operate the original system but is not historically significant in its own right.

The project APE partially intersects the boundary of Tunnel Creek Flume, which is listed in the NRHP as a contributing feature of the Marlette Lake Water System with a period of significance of 1872 to 1887. Within the APE, near the base of Marlette Dam, the original flume bed was partially buried beneath the earth embankment dam constructed in 1959 over the original stone masonry structure. The flume bed also does not coincide through this section with the recreational Flume Trail, which has elsewhere preserved the location and dimensions of the original flume course. Instead, the trail takes a different route across Marlette Creek and the original flume bed is lost among the hillside boulders and vegetation. As such, the portion of the Flume Trail within the project APE proposed for improvement does not contribute to the significance of the Tunnel Creek Flume and therefore will not result in an adverse effect to the Tunnel Creek Flume (Tahoe Flume Trail).

The APE includes North Canyon Road (north and south sections) and the Glenbrook Railroad Grade as project construction access routes. Although neither the road nor railroad grade are eligible for the NRHP individually, both are eligible for the NRHP as contributors to a potential historic district with important Comstock-era associations, as well as Basque sheepherding associations for the road. SHPO has previously concurred with the finding of eligibility for the Glenbrook Railroad Grade.

The movement of heavy equipment is not expected to damage the road or railroad grade. If damage does occur, the road will be temporarily stabilized by adding a 3-6-inch-thick aggregate base layer to prevent excessive rutting and erosion. Stabilized areas would be restored to pre-project conditions after construction is complete, in keeping with the Secretary of the Interior's Standards for the Treatment of Historic Properties. Thus, the project would not introduce permanent visual, atmospheric, or audible elements or diminish the properties' integrity of location, setting, design, materials, workmanship, feeling, or association. The project will raise the northwest end of North Canyon Road, adjacent to the dam, to keep it above the highwater level. This road end was constructed at the time of the final dam raising in 1957, outside of the resource's period of significance. As this road segment does not contribute to the historic character of the property, its alteration will not impact the historic significance of the overall resource. As such, the project would not have adverse effect on North Canyon Road or the Glenbrook Railroad Grade.

Table 2. Built Environment Determinations of Effect Summary.

Resource	Nevada Site No.	NHRP Eligibility	Adverse Effect
Marlette Dam	26OR393/WA6931	Ineligible	No
Tunnel Creek Flume	26WA6929	Eligible as a contributor to a listed historic district	No
North Canyon Road (South Section)	26OR346/DO751	Eligible as a contributor to a potential historic district	No

Resource	Nevada Site No.	NHRP Eligibility	Adverse Effect
North Canyon Road (North Section)	26OR347/WA6955	Eligible as a contributor to a potential historic district	No
Glenbrook Railroad Grade	26DO605 / OR247	Eligible as a contributor to a potential historic district	No

Memorandum of Agreement

As part of the Undertaking, the Marlette Lake reservoir will be dewatered by approximately 22-feet below the spillway crest to allow construction access to the dam. This will expose areas around the circumference of the reservoir that are typically inundated and inaccessible to archaeological and historic architectural surveys. Dewatering would occur over the course of several months and may expose previously unidentified historic properties.

In our June 2023 consultation with SHPO, FEMA proposed to draft a Memorandum of Agreement (MOA) to consider the effects of the Undertaking on historic properties that may be exposed through lake drawdown or identified through evaluation efforts associated with the Undertaking. The draft MOA, which will be submitted shortly under separate cover, stipulates that a Historic Properties Treatment Plan (HPTP) will be prepared for the Undertaking and that (1) appropriate measures will be taken to identify and evaluate cultural resources exposed through lake drawdown; (2) adverse effects to historic properties will be mitigated through data recovery, recordation, and/or public interpretation as appropriate; and (3) procedures for monitoring and reporting unexpected discoveries and unanticipated effects to historic properties will be implemented. The MOA also outlines FEMA's reporting and consultation requirements with respect to the Undertaking.

Tribal Involvement

In accordance with Section I.C of the Agreement, FEMA is required to consult with Federally recognized Tribes in a manner appropriate to the nature and scale of the Undertaking. FEMA sent letters regarding geotechnical boring for the design phase of the project to the following Tribes on October 26, 2020: Washoe Tribe, Reno-Sparks Indian Colony, Pyramid Lake Paiute Tribe, Walker River Paiute Tribe, Confederated Tribes of the Warm Springs Reservation, Yerington Paiute Tribe, Paiute-Shoshone Tribe of the Fallon Reservation, and the Fort McDermott Paiute and Shoshone Tribes. On October 26, 2020, Marjorie Nowick of FEMA discussed the geotechnical borings with Darrell Cruz, Tribal Historic Preservation Officer (THPO) for the Washoe Tribe of California and Nevada (Washoe Tribe). Patrick Burtt, who replaced Darrell Cruz as THPO for the Washoe Tribe of California and Nevada, expressed interest in being a consulting party in discussion with Lisa Holm of FEMA. On July 24, 2023, Lisa Holm contacted Mr. Burtt to discuss the status of the project and proposed archaeological testing within the APE. Mr. Burtt requested a virtual meeting be scheduled on August 28, 2023; however, he was unable to attend the meeting and subsequent attempts at contact received no response. FEMA will continue to consult with the Tribes, particularly the Washoe Tribe, now

that ninety-percent engineering designs have been developed and the final APE for the larger Undertaking has been defined.

Public Involvement

FEMA will complete an Environmental Assessment (EA) for National Environmental Policy (NEPA) compliance for the larger Marlette Lake Dam Resilient Infrastructure Project. As part of this larger effort, FEMA will involve the public as well as you and your staff, SPWD, NDEM, NV State Parks, the U.S. Forest Service, the Advisory Council on Historic Preservation (ACHP), National Parks Service (NPS), appropriate Tribes, and the environmental, recreational, and historic preservation communities.

Determination of Effect

Based on the identification and evaluation efforts outlined above, FEMA has determined that there are six (6) historic properties as defined in 36 CFR §800.16(l) within the APE – Tunnel Creek Flume (26WA6929, also known as the Tahoe Flume Trail), North Canyon Road—South Section (26OR346 / DO751), North Canyon Road—North Section (26OR347 / WA6955), Glenbrook Railroad Grade (26DO605 / OR247), Marlette Station archaeology site (26WA2811/6930), and the overseas Chinese camp site (26OR335 and 26OR345). No artifacts or features associated with the Marlette Station archaeology site or Chinese camp site were detected within proposed project activity areas, and each site would be subject to the Project Conditions below. The APE is located within a National Register Historic District (Marlette Lake Water System, NR#920001162). The locus of project activity, the Marlette Dam structure (26OR393 / WA6931), is not eligible for the NRHP due to loss of integrity and character through modification.

The inclusion of Project Conditions as stipulations for funding, defined in the following section, would minimize unintended effects to historic properties during all stages of project work. Accordingly, FEMA has determined a finding of **No Adverse Effect (with Conditions)** pursuant to Stipulation II.C.5(a) of the Agreement.

Project Conditions

To minimize unintended impacts to historic properties, the following requirements, in addition to the requirements set forth in the MOA for activities associated with the dewatering of Lake Marlette, would be stipulated as a condition for funding by FEMA:

1) To minimize possible impacts to archaeological resources, an archaeologist meeting the Secretary of Interiors'(SOI) qualification standards shall monitor all ground disturbing activities associated with the Undertaking. The monitoring activities are to be documented in a report meeting the Nevada State Historic Preservation Office report standards for a Phase I investigation and submitted to FEMA's Historic Preservation Department for review. FEMA will submit the report to the SHPO and consulting Tribes. In addition, updated post-work site forms will be submitted to the SHPO by the archaeological contractor.

2) To minimize possible impacts to materials that may hold value to consulting Tribes, the Tribes may choose to stipulate that a Native monitor be present during ground disturbing activities associated with the Undertaking. If this request is made during FEMA's ongoing consultation with the Tribes, it will be included as a condition of the grant award.

3) Archaeological and tribal monitor(s) will have the authority to stop work activities to investigate and document any cultural materials or potential features. If archaeological deposits are identified, all work in the vicinity of the find will be stopped. The Applicant shall notify FEMA of the finding as early as possible, but no later than 24 hours after they were notified of the discovery by the archaeologist. The Applicant will take all reasonable measures to avoid or minimize harm to the property until FEMA has consulted with the SHPO and consulting Tribes, and additional measures identified during FEMA's consultation have been implemented.

4) In coordination with an SOI-qualified archaeologist, boundary fencing (i.e., orange construction fencing or highly visible rope fencing) will be placed and maintained to clearly identify and surround the limits of the two archaeological resources located in direct proximity to the project APE, including:

    a) Site 26OR335/345 (with each of the two loci to be fenced individually).

    b) Site 26WA2811/6930, "Marlette Station" (with each of the five loci to be fenced individually).

5) Boundary fencing (i.e., orange construction fencing or highly visible rope fencing) will be placed and maintained to clearly identify the limits of site grading, equipment staging, material stockpiling areas, and pullouts to protect adjacent areas.

6) Trees or bushes outside the APE that are obstructing equipment movement will be confined to trimming to the greatest extent possible. If removal is unavoidable, trees or bushes should be cut flush at ground level with root balls left intact.

7) All ground-disturbing activities will be effectively controlled using appropriate Best Management Practices (e.g., water trucks, spraying) to hinder fugitive dust emissions.

8) If human skeletal remains are discovered at any time during project activities, project managers must stop work immediately and notify the Washoe County Sheriff's Office, the Washoe County Coroner's Office, NDEM, and FEMA. Local law enforcement officials are to assess the nature and age of the human skeletal remains. The Applicant shall take all reasonable steps to ensure that the remains are avoided and protected until law enforcement arrives. FEMA shall work with the SHPO, Washoe Tribe, the Applicant, and NDEM to ensure the Undertaking is conducted in compliance with state law and any other applicable laws. In addition, FEMA shall require that the guidelines contained in the Advisory Council on Historic Preservation's 2023 "Policy Statement on Burial Sites, Human Remains, and Funerary Objects" are also followed. Project work would not resume until the remains have been treated according to Federal and state regulations.

Conclusions

We respectfully request concurrence with FEMA's revision to the project APE addressing your July 2023 comments; eligibility recommendations and determinations of effect for Tunnel Creek Flume (26WA6929, also known as the Tahoe Flume Trail), North Canyon Road—South Section (26OR346 / DO751), North Canyon Road—North Section (26OR347 / WA6955), Glenbrook Railroad Grade (26DO605 / OR247), Marlette Lake Dam (260R393 / WA6931), Marlette Station archaeology site (26WA2811/6930), and the overseas Chinese camp archaeology site (26OR335 and 26OR345); and Project Conditions. FEMA further requests your review of the draft MOA, to be included under separate cover, to govern the identification of historic properties that may be exposed through lake drawdown. Your prompt review of this project is greatly appreciated. Per Stipulation I.E of the Agreement, the SHPO has 30-days to review FEMA's determination. If the SHPO does not object to the determination within 30-days of receipt of this letter and documentation, the Section 106 review of the Undertaking will have concluded per Stipulations I.E.2(b) and II.C.4(a) of the Agreement and FEMA may proceed to fund the Undertaking.

Should you have any questions or comments, please do not hesitate to contact Jakob Crockett, Archaeologist, at jakob.crockett@fema.dhs.gov, (202) 286-6275, or the letterhead address.

Sincerely,

Lisa Holm

Lisa Holm,
Senior Environmental Protection Specialist
for Regional Environmental Officer
FEMA Region IX

Attachments

- Attachment 1: Location and Area of Potential Effect Maps
- Attachment 2: Ninety-Percent Design Drawings
- Attachment 3: Photographs
- Attachment 4: *Archaeological Investigations at Four Sites for the Marlette Lake Dam Stabilization Project, Lake Tahoe Nevada State Park.* Far Western Archaeological Research Group, December 2023
- Attachment 5: *Built Environment Evaluation Report: Section 106 of the National Historic Preservation Act Compliance for the Marlette Lake Dam Resilient Infrastructure Project, Washoe County, Nevada*. JRP Historical Consulting LLC, March 2023

U.S. Department of Homeland Security
Region IX
1111 Broadway, Suite 1200
Oakland, CA 94607-4052

FEMA

IN REPLY REFER TO:
LH-PDMC-PJ-09-NV-2018-001

March 25, 2024

Rebecca Palmer
Nevada State Historic Preservation Officer
State Historic Preservation Office
901 South Stewart Street, Suite 5004
Carson City, NV 89701

Re: Section 106 Continuing Consultation
PDMC-PJ-09-NV-2018-001
Project: Marlette Lake Dam Resilient Infrastructure Project
Subapplicant: Nevada State Public Works Division
Phased Identification and Evaluation Proposal

Dear Ms. Palmer:

The U.S. Department of Homeland Security's Federal Emergency Management Agency (FEMA) proposes to provide Federal financial assistance under the Pre-Disaster Mitigation Competitive Grant Program (PDMC) to the Nevada State Public Works Division (SPWD or Subapplicant) through the Nevada Division of Emergency Management (NDEM or Applicant) to support the Marlette Lake Dam Resilient Infrastructure Project (Undertaking). The project is aimed at reducing risks to critical infrastructure and the downstream public by implementing seismic safety improvements to the Marlette Lake Dam and spillway.

By letter dated July 26, 2023, FEMA requested your review and approval of proposed archaeological and historic architectural identification and evaluation efforts for the Undertaking in support of FEMA's compliance with Section 106 of the National Historic Preservation Act (NHPA). By letter dated August 14, 2023, your office agreed with FEMA's approach to identification and evaluation, and FEMA described the results of those efforts in a letter dated March 5, 2024. FEMA included in that letter ninety-percent engineering design plans for the project, provided updated Area of Potential Effect maps, and proposed a finding of **No Adverse Effect to Historic Properties (with Conditions)** for archaeological and historic architectural properties within and adjacent to the construction footprint for the project. FEMA also proposed to draft a Memorandum of Agreement (MOA) to consider the effects of the Undertaking on historic properties that may be identified following the partial drawdown of Marlette Lake reservoir, which will be required to complete seismic safety improvements to the dam and spillway.

Complete information on areas that would be exposed following the partial drawdown of Marlette Lake reservoir cannot be provided in advance of project implementation; therefore, FEMA proposes a phased protocol to complete identification and evaluation efforts for the Undertaking. Per 36 CFR §800.4(b)(2), final identification and evaluation of historic properties may be deferred if it is specifically provided for in a Memorandum of Agreement executed pursuant to 36 CFR §800.6, a Programmatic Agreement executed pursuant to 36 CFR §800.14(b), or documents used by an agency to comply with the National Environmental Policy Act (NEPA) pursuant to 36 CFR §800.8. In lieu of a formal MOA, FEMA proposes a phased compliance approach that will be incorporated as a condition of the project grant and provided for in an Environmental Assessment (EA) being prepared for the project by FEMA. This approach will guide compliance with Section 106 of the NHPA while allowing the project to be implemented in a timely way.

Pursuant to the 2023 Programmatic Agreement (Agreement) among FEMA, the Nevada State Historic Preservation Officer (SHPO), and NDEM, FEMA respectfully requests continuing consultation with your office on the proposed Undertaking and seeks your concurrence with this phased approach to complete identification and evaluation efforts for the project.

Project Location

Marlette Lake Dam is an earthen-filled dam located along Marlette Creek in Washoe County on the east side of the Lake Tahoe Basin (39.172864, -119.907403). The dam and reservoir are part of the historic Marlette Lake Water System (MLWS), a National Register Historic District (NR#920001162) and National Civil Engineering Landmark. Originally developed in the 1870's, the system supplies water to Virginia City, Silver City, Gold Hill, and Carson City. The MLWS includes Marlette Lake, Hobart Reservoir, and a system of flumes and pipelines that transport an average of 16,925-acre feet of water per year. **Attachment 1** contains a project location and vicinity map.

Undertaking

The Marlette Lake Dam is owned by the State of Nevada and is part of the Lake Tahoe-Nevada State Park in the Lake Tahoe Basin. The dam is in a high seismic hazard area and is classified as a "High Hazard Dam" in the National Inventory of Dams maintained by the U.S. Army Corps of Engineers. It was originally constructed beginning in 1873 as an earthen-filled dam that retains Marlette Creek. It has been modified twice, most recently in 1959 to raise the height of the dam. The current dam is approximately 52 feet high, with a crest length of approximately 250 feet and a width of approximately 13 feet at the dam crest. The reservoir created by the dam has a storage capacity of roughly 11,780 acre-feet of water. There is one concrete lined spillway on the north side of the dam and one outlet pipe with a manual control on the top of the dam. The spillway discharges to Marlette Creek, which flows under State Route 28 via an existing box culvert and then to Lake Tahoe. The outlet pipe historically discharged to a flume that moved water to Virginia City and Carson City via a tunnel through the mountain. After a cave-in at the tunnel, the flume was abandoned, and the outlet pipe now discharges to Marlette Creek.

The ninety-percent design for the project includes (1) stabilizing the existing dam embankment structure; (2) replacing the emergency spillway; (3) improving operational outlets; and (4) raising a portion of an existing access road adjacent to the dam. Stabilizing the dam would involve enlarging the downstream embankment with imported fill material for lateral support and establishing a two-stage toe drain, which would extend the toe of the dam an additional 48 feet. The dam height would be raised approximately 3 feet to address freeboard deficiencies. The existing concrete spillway would be removed and replaced with a new concrete box culvert and spillway. The existing primary outlet piping within the dam, which is currently corroding, would be replaced with new outlet pipe via open cut excavation. Marlette Creek would be re-graded at the outlet and a riprap stilling basin constructed. A 10-foot by 10-foot masonry building would be erected on the dam crest to house new controls for the outlet piping. Design drawings for the project are included as **Attachment 2**.

Dewatering and Cofferdam Installation and Removal

Replacing the outlet pipe would require dewatering Marlette Lake reservoir to approximately 22 feet below the spillway crest. The lake would be lowered using the existing primary outlet, with a proposed maximum release of 25-cubic-feet per second (cfs) discharge to protect downstream habitat along Marlette Creek. Drawdown of the reservoir would rely on existing facilities and would occur over the course of several months, with a proposed start date in September 2024. Water releases would be limited to flows less than or equal to downstream conveyance system capacities, thus the existing water system and Marlette Creek are not expected to be impacted by the proposed drawdown. The drawdown is anticipated to be completed by the Spring of 2025 and so would mostly occur during the winter months when Marlette Lake reservoir is largely inaccessible due to weather and access constraints. After construction, the reservoir would be allowed to recharge naturally.

Access Roads

Construction equipment would access the dam using North Canyon Road, a 15-foot-wide access road that runs south to north from Spooner Lake off State Route 28 near the intersection of U.S. 50 (Lincoln Highway). At the south end of Marlette Lake, North Canyon Road transitions into the Tahoe Flume Trail, a gravel access road to the dam site. Use of North Canyon Road for access would require some tree and brush trimming and the improvement of several pullouts. A section of the Tahoe Flume Trail northeast of the dam site would be re-graded and raised approximately 5 feet to accommodate a temporary truck turnaround. During project construction, North Canyon Road would be temporarily closed to the public for safety considerations. Following construction, the road would be restored to pre-project conditions, including the repair of any damaged culvert crossings.

Area of Potential Effect

As defined in 36 CFR §800.16(d), the Area of Potential Effect (APE) is the geographic area or areas within which an Undertaking may directly or indirectly cause changes in the character or use of historic properties. This includes (a) the proposed work areas centered on the Marlette

Lake Dam; (b) parking, storage, and staging areas; (c) pullouts; (d) access roads; (e) and the proposed lake drawdown area. **Attachment 1** contains a map of the project APE.

The vertical APE, or the depth of proposed ground disturbing activities, is expected to range from up to (a) 7 feet to replace weathered material along Marlette Lake Dam with imported fill material; (b) 7 feet to replace the existing concrete emergency spillway with the new concrete box culvert; (c) 12 inches for grading and vegetation clearance along the Tahoe Flume Trail adjacent to the dam; and (d) 4 feet for grading at the creek outlet to construct the riprap stilling basin. A trench would be cut, bisecting the middle of the dam, to a depth of approximately 50 feet to access the existing outlet pipes running through the bottom of the dam. Staging and construction access are expected to result in minimal or no ground disturbance, as North Canyon Road is maintained and of sufficient width to allow equipment access. No vertical ground disturbance is associated with the lake drawdown, however previously submerged margins of the reservoir would be exposed and may be subject to limited recreational access before the start of project construction when access roads are closed to the public.

Project activities having the potential to temporarily effect historic properties directly or indirectly, including visual, audible, and atmospheric effects, would be minimized through appropriate control measures, including water spraying to control dust emissions, exclusion fencing to protect known archaeological properties, and restricting access to North Canyon Road during construction. The APE depicted in **Attachment 1** matches the APE presented in FEMA's March 5, 2024, consultation letter and incorporates the SHPO's comments from August 14, 2023, to include within the APE a narrow corridor between North Canyon Road and the lakeshore that was previously excluded.

Identification and Evaluation of Historic Properties

In its March 5, 2024, letter to the SHPO, FEMA described efforts undertaken in accordance with Stipulation II.C.3 of the Agreement to identify historic properties within the APE and project vicinity. FEMA determined that there are four (4) known properties listed or eligible for listing on the National Register of Historic Properties (NRHP) within the APE and that the APE is within a National Register Historic District (NR#920001162). Each of these properties was recorded within or proximate to the construction footprint of the project, and after applying the Criteria of Adverse Effect FEMA recommended a finding of **No Adverse Effect (with Conditions)** pursuant to Stipulation II.C.5(a) of the Agreement.

In assessing the proposed lake drawdown area, FEMA SOI-qualified archaeologist Lisa Holm reviewed FEMA's March 5, 2024, consultation letter to the SHPO, photographs, maps, the archaeological and built environment reports submitted to the SHPO for the project to date, and Nevada Cultural Resource Information System (NVCRIS) records to identify historic properties that may overlap the lake drawdown area beyond the project construction footprint. Apart from the Marlette Lake reservoir, which is a contributing component of the MLWS, no historic properties are known to overlap the lake drawdown APE outside of the project construction footprint. Four (4) cultural resources have been previously recorded within 100 meters of the lake edge, however, and these resources are summarized below and in Table 1. NVCRIS records for each are provided in **Attachment 3**.

Site **26OR38/3-3189** was recorded by Donald Hardesty in 1979 as a 10-by-10 meter area of stacked logs with twentieth century artifacts near a fish hatchery located approximately 20 meters from the south end of the lake. Hardesty noted the logs may have been floated there during a period of high water levels and dated the site to ca. 1957. Site **26OR40** was recorded by Bob Elston in 1979 as a 1-by-1 meter scatter of pressure flaked gray and mahogany-striped obsidian debitage that was interpreted as the result of contemporary knapping activity. The site was recorded along North Canyon Road (OR347/WA6955) and could not be relocated during a 2000 survey by Far Western Anthropological Resource Group, Inc. (FWARG). Site **26OR329** was recorded by Sharon Waechter of FWARG in 2002 as a historical Basque arborglyph located approximately 40 meters from the edge of Marlette Lake featuring Laburu ("four heads") or the Basque cross. Finally, site **26WA2809** was most recently recorded by FWARG in 2000 as a sparse lithic scatter of 25-30 flakes within a 65-by-40 meter area on a southwest trending finger ridge overlooking the southeast shore of Marlette Lake reservoir. The scatter contained mostly chert as well as basalt, obsidian, and chalcedony and was marked by two modern recreational fire rings. Site 26WA2809 was reported 80 meters east of the lakeshore and 200 meters west of North Canyon Road.

Table 1. Known Cultural Resources Proximate to the Lake Drawdown Area of Potential Effect.

Nevada Site No.	Resource Description	Location	NHRP Eligibility
26OR38/ 3-3189	Historical 10-by-10 meter area of stacked logs near a fish hatchery with twentieth century artifacts.	Twenty meters from the south end of the lake.	Not evaluated
26OR40	A 1-meter by 1-meter area of obsidian debitage described as the result of possible contemporary knapping activity.	Near south shore of Marlette Lake along access road (OR347/ WA6955).	Not evaluated
26OR329	Historical arborglyph ("lau/ bu/ ru" and Basque cross).	Forty meters from southeast edge of lake.	Not evaluated
26WA2809	A sparse scatter of 20 lithic flakes across a 65-by-40 meter area near the lakeshore with no diagnostic tools noted.	On the tip of a southwest trending point southeast of Marlette Lake.	Not evaluated

In addition to the four resources above, site **26WA1413** is mapped in NVCRIS along the eastern side of Marlette Lake. IMAC forms, however, indicate the site is located north of the Steamboat Hills and south of State Route 431 some 15 miles north of Marlette Lake. Although 26OR38/3-3189, 26OR40, 26OR329, and 26WA2809 were each recorded within 100 meters of Marlette Lake, none were reported as extending to the edge of the reservoir or below the contemporary water line.

In a study commissioned by the U.S. Army Corps of Engineers, John Ware (1989) examined the effects of inundation on archaeological sites, including the effects of *mechanical processes* such as physical erosion, sediment deposition, and wave action; *biochemical processes* related to climatic conditions and water chemistry; and *human impacts* related to infrastructure development, recreation, and vandalism (see **Attachment 4**). Ware (1989:20) also defined different impact zones, including a *conservation pool level* below the average annual reservoir drawdown level; a *fluctuation* or *drawdown zone* exposed to periodic, typically annual shoreline

fluctuations; and a *backshore zone* marked by the non-inundated reaches of the reservoir shoreline. He noted that "Within the fluctuation zone of a reservoir (Zone 2), mechanical impacts of wave and water motion will dominate during the life of the reservoir, although biochemical and human impacts are also very active in the littoral zone" (Ware 1989:20).

The portion of the APE that is expected to be exposed through lake drawdown may be characterized as a fluctuation zone that is periodically exposed to shoreline and nearshore wave action and wave inducted currents. In addition to these erosional effects, this zone is also subject to biochemical effects in the form of periodic wetting and drying, freezing and thawing, and floral and faunal intrusion (Ware 1989:30). Because much of the lake drawdown area has been subject to these mechanical and biochemical impacts since Marlette Lake was formed, there is expected be a low likelihood of encountering intact archaeological materials or features within the drawdown APE. There may be the potential to encounter more substantive or structural features such as the ca. 1957 stacked logs recorded 20 meters south of the current lakeshore (26OR38/ 3-3189), however none of the sites noted above within 100 meters of the reservoir were reported as extending below the waterline.

Tribal Involvement

FEMA sent letters on October 26, 2020, regarding the initial design phase of the project to the Washoe Tribe of California and Nevada (Washoe Tribe), Reno-Sparks Indian Colony, Pyramid Lake Paiute Tribe, Walker River Paiute Tribe, Confederated Tribes of the Warm Springs Reservation, Yerington Paiute Tribe, Paiute-Shoshone Tribe of the Fallon Reservation, and the Fort McDermott Paiute and Shoshone Tribes. Tribal Historic Preservation Officer (THPO) Darrell Cruz of the Washoe Tribe expressed interest in the Undertaking and consulted with FEMA on geotechnical boring for the project in October 2020. On July 24, 2023, in advance of proposed subsurface testing and evaluation of archaeological sites within the project APE, FEMA contacted THPO Patrick Burtt of the Washoe Tribe to update him about the project. Mr. Burrt expressed interest in the project and requested a meeting with FEMA on August 28, 2023, however he was unable to attend that meeting and subsequent attempts at contact yielded no response. On March 14, 2024, FEMA sent letters via certified mail and email to each of the Tribes contacted in 2020 to provide an update on the project, current APE maps for the ninety-percent project design, and to solicit any comments, feedback, or concerns the Tribes may have about project construction and drawdown of Marlette Lake reservoir. FEMA will continue to consult with the Tribes, particularly the Washoe Tribe, now that ninety-percent engineering designs have been developed and the final APE for the Undertaking has been defined.

Public Involvement

FEMA is drafting an EA for NEPA compliance for the project. As part of this process, FEMA will involve the public as well as the SHPO, SPWD, NDEM, NV State Parks, the U.S. Forest Service, the Advisory Council on Historic Preservation (ACHP), National Parks Service, appropriate Tribes, and the environmental, recreational, and historic preservation communities.

Phased Section 106 Compliance

As noted above, FEMA proposes a phased process to complete identification and evaluation efforts for the Undertaking consistent with 36 CFR §800.4(b)(2), specifically for those areas that will remain inaccessible until the project has been initiated and the drawdown of Marlette Lake reservoir has been completed to levels sufficient for project construction. No known historic properties overlap the lake drawdown area beyond the construction footprint apart from the reservoir itself, and the effects of the mechanical and biochemical processes noted above suggest there is a low likelihood of encountering intact archaeological materials or features within the fluctuation or drawdown zone. Nevertheless, FEMA proposes the phased approach below for identification and evaluation efforts within the drawdown APE.

The following phased compliance approach is proposed as a **condition of the grant**:

1. **Select an SOI-Qualified Lead Archaeologist**: Prior to initiating the drawdown of Marlette Lake reservoir (proposed September 2024), the Subapplicant shall submit to FEMA for review the name and qualifications of a Lead Archaeologist for the project who meets the Secretary of the Interior's (SOI) Qualification Standards for Archaeology (36 CFR Part 61) (Qualified). FEMA will submit the name and qualifications of the Lead Archaeologist to the SHPO for review and request the SHPO concur with the selection of Lead Archaeologist or recommend an alternative name be put forward within 15 days.

2. **Develop an Archaeological Survey Plan for Dewatered Area**: Once a Lead Archaeologist has been approved by the SHPO, FEMA will meet with the Subapplicant, Applicant, and Lead Archaeologist to discuss the strategy and logistics of an intensive archaeological survey of the lake drawdown area. The survey will be coordinated to take into consideration the proposed dewatering and construction schedule, safety measures necessary for the archaeological team to carry out the survey, and any recommendations provided by consulting Tribes.

3. **Submit and Approve the Archaeological survey Plan:** Within 30 days of the meeting, the Lead Archaeologist will submit to FEMA for review a written proposal for the intensive archaeological survey that includes summary background research, the results of an updated NVCRIS search of the lake drawdown area and vicinity, and the proposed survey, recording, and reporting methodology. FEMA will review the proposal and provide comments within 15 days of receipt. The Lead Archaeologist will have 15 days to make any revisions, and the revised proposal will be submitted to the SHPO and consulting Tribes for review. FEMA will request the SHPO and consulting Tribes provide comments or concurrence on the proposal within 30 days. Comments will be addressed by the Lead Archaeologist within 15 days of receipt and FEMA will submit a final proposal to the SHPO and consulting Tribes for approval with a 30-day comment period.

4. **Bi-Weekly Meetings:** Once the drawdown of Marlette Lake reservoir has been initiated and until project construction has been completed, the Subapplicant and Lead Archaeologist shall participate in bi-weekly meetings to monitor progress and identify

any concerns. These meetings will be scheduled by FEMA and will include the Applicant and other parties as appropriate. The tempo of these meetings may be changed to a monthly schedule rather than a bi-weekly schedule as appropriate and if agreed to by all participants.

5. **Carry Out Intensive Archaeological Survey:** Once dewatering has been completed (estimated March 2025), the Lead Archaeologist shall lead an intensive archaeological survey to identify and evaluate cultural resources that may be encountered along the exposed margins of Marlette Lake reservoir. The intensive survey shall meet the objectives and standards of the Secretary of the Interior's Guidelines for Identification (https://www.nps.gov/articles/sec-stds-identification-guidelines.htm) and shall begin with the area closest to the dam as it overlaps the construction footprint (e.g., face of the dam and area of coffer dam installation). If cultural resources are observed in the dewatered area as it overlaps the construction footprint, they will be treated as an unexpected discovery. Condition 9 below will be implemented immediately consistent with Stipulation II.B of the Agreement. If no cultural resources are observed in the dewatered portion of the construction footprint, installation of the temporary coffer dam and other construction activities will be allowed to proceed while the intensive archaeological survey of the remainder of the drawdown area is carried out.

6. **Preparation and Submittal of Report:** The results of the intensive archaeological survey will be presented in a report and submitted to FEMA for review within 30 days of completion of the survey. The level of information and documentation contained in the report shall be consistent with the Secretary of the Interior's Standards for Archeological Documentation and the Secretary of the Interior's Archeological Documentation Guidelines (https://www.nps.gov/articles/sec-standards-archeo-doc-guidelines.htm). The archaeological survey report shall include, but not be limited to, background research; the results of the updated NVCRIS search for the lake drawdown area and vicinity; descriptions and photographs of any archaeological materials and features observed during the survey; IMACS forms documenting any cultural resources discovered; and a preliminary assessment of the integrity and significance of any observed cultural resources. If historic period built environment structures or features are encountered during the intensive survey, a SOI Qualified Architectural Historian will document the finds on State of Nevada ARA forms and present a preliminary assessment of the integrity and significance of the resources in a built environment report to be submitted with the archaeological survey report.

7. **Review and Comment Period:** FEMA shall review and provide comments on the draft survey report within 15 days of receipt. The Lead Archaeologist shall have 15 days to make any necessary revisions and resubmit the report. Once the draft survey report is deemed adequate, FEMA will submit the report to the SHPO and to the consulting Tribes if requested along with FEMA's findings and recommendations. The SHPO and consulting Tribes shall provide comments on the draft survey report within 30 days. The Lead Archaeologist will have 15 days to address any comments, and FEMA will submit a revised report to the SHPO and consulting Tribes for a final 30-day review.

8. **Finding of Effect:** With submission of the intensive archaeological survey report, FEMA will propose a finding of No Historic Properties Affected consistent with Stipulation II.C.4 of the Agreement or will apply the Criteria of Adverse Effect pursuant to Stipulation II.C.5 of the Agreement. If the SHPO concurs with a finding of No Historic Properties Affected, FEMA will issue a Notification of Completion of Section 106 Review for the project. This Notification of Completion will include any conditions (if applicable) that must be carried out by the Subapplicant.

    a. **Resolving an Adverse Effect (if applicable):** If FEMA finds the Undertaking may adversely affect historic properties identified during the intensive archaeological survey of the lake drawdown area, FEMA shall resolve the effects of the Undertaking in consultation with the SHPO, Applicant, Subapplicant, consulting Tribes, and ACHP (if participating) following an Abbreviated Consultation Process consistent with Stipulation II.C.6.a of the Agreement. Taking into consideration the significance of the historic properties affected, the severity of the adverse effect(s) and avoidance or minimization of the adverse effect(s), FEMA shall propose in writing the implementation of a specific Treatment Measure, or combination of Treatment Measures, with the intent of expediting the resolution of adverse effects, and provide documentation as required by 36 CFR §800.11(e) subject to the confidentiality provisions of 36 CFR §800.11(c). Unless a consulting party or the ACHP objects within 15 days of receipt of FEMA's proposal, FEMA shall proceed with the implementation of the Treatment Measure(s) and will conclude the Section 106 review. If any of the consulting parties or the ACHP objects to the resolution of adverse effects within the 15-day review and comment period, FEMA shall consult with the objecting party to resolve the dispute or resolve the adverse effect(s) through the use of an MOA per Stipulation II.C.6(b) of the Agreement or a Programmatic Agreement per Stipulation II.C.6(c) of the Agreement.

    b. **Completion of Treatment Measures:** FEMA shall provide written notice to the consulting parties within 60 days of the completion of the Treatment Measure(s), which will serve as confirmation that the Treatment Measure(s) for the Undertaking have been implemented. FEMA also shall include information pertaining to the completion of the Treatment Measure(s) in its annual reporting pursuant to Stipulation I.B.1(d) of the Agreement.

9. **Unexpected Discoveries:** Upon notification by the Subapplicant of an unexpected discovery during project implementation, or if it appears that the Undertaking has affected a previously unidentified property or affected a known historic property in an unanticipated manner, the Applicant will immediately notify FEMA and require the Subapplicant to:

    a. Stop any construction activity in the vicinity of the discovery and

    b. Take all reasonable measures to avoid or minimize harm to the property until FEMA has completed consultation with the SHPO, consulting Tribes, and any other

consulting parties to evaluate the discovery for NRHP eligibility and/or the effects of the Undertaking on historic properties.

c. If human remains are discovered, the Subapplicant will immediately notify local law enforcement, the coroner or medical examiner, and the SHPO consistent with Nevada Revised Statutes (NRS) Chapters 259, 383, and 451 and will protect the remains from any harm. Discoveries of human remains on federal or Tribal lands shall be subject to the Native American Graves Protection and Repatriation Act (NAGPRA) (25 USC §3001-3013, 18 USC §1170) and Archaeological Resources Protection Act (ARPA) (16 USC §§470aa et seq), as applicable. If discovered human remains are determined to be Native American, FEMA shall consult with the appropriate Tribal representatives and the SHPO and will comply with all provisions under Stipulation III.B of the Agreement. In addition, FEMA shall follow the guidelines outlined in the ACHP's "Policy Statement on Burial Sites, Human Remains, and Funerary Objects" (2023).

Conclusions

Areas that would be dewatered adjacent to the dam to install the temporary coffer dam have been exposed and disturbed as part of prior dam construction and repair efforts, and it is not anticipated that previously unrecorded resources will be encountered within the lake drawdown area as it overlaps the construction footprint. Areas that would be dewatered outside of the construction footprint are not expected to be directly disturbed by repairs to the dam or spillway; however, historic properties in those areas, if identified, may be subject to mechanical, biochemical, and/or human impacts from erosion, wave action, shifts in climatic conditions, and/or deliberate or inadvertent human disturbance.

No known historic properties apart from the Marlette Lake reservoir itself overlap the lake drawdown area outside the project construction footprint. Sufficient information on areas that would be exposed through lake drawdown cannot be provided in advance of dewatering; therefore, FEMA proposes the above phased approach to ensure compliance with Section 106 of the NHPA throughout project implementation. Consistent with 36 CFR 800.4(b)(2), the terms of this phased compliance approach will be outlined in the project EA and conditioned as a part of the grant award.

We respectfully request the SHPO's concurrence with the phased compliance approach outlined above within thirty (30) calendar days. FEMA recognizes that consultation will continue throughout the implementation phase of the Undertaking to address any issues and concerns that may arise during dewatering and project construction. Should you need additional information or have any questions or comments, please do not hesitate to contact Lisa Holm at lisa.holm@fema.dhs.gov (202) 803-3839, or the letterhead address.

Sincerely,

Lisa Holm

Lisa Holm,
Senior Environmental Protection Specialist/
Archaeologist *for*
Aaron Clark,
Regional Environmental Officer
FEMA Region IX

References:

Ware, John A. (1989) Archaeological Inundation Studies: Manual for Reservoir Managers. Contract Report EL-89-4, U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS. Available at https://apps.dtic.mil/sti/tr/pdf/ADA213319.pdf.

Attachments:

Attachment 1: Location and Area of Potential Effect Maps
Attachment 2: Ninety-Percent Design Drawings
Attachment 3: NVCRIS Records for 26OR38/ 3-3189, 26OR40, 26OR329, and 26WA2809
Attachment 4: Archaeological Inundation Studies: Manual for Reservoir Managers (Ware 1989)

NEVADA
STATE HISTORIC PRESERVATION OFFICE

STATE OF NEVADA
Department of Conservation and Natural Resources

Joe Lombardo, *Governor*
James A. Settelmeyer, *Director*
Rebecca L. Palmer, *Administrator*

April 3, 2024

Lisa Holm
Senior Environmental Protection Specialist
Federal Emergency Management Agency, Region IX
1111 Broadway Suite 1200
Oakland CA 94607-4052

RE: Letter of April 1, 2024 Revised to add link and cc to State Agencies.
Marlette Lake Dam Resilient Infrastructure Project, Washoe and Douglas Counties
(SHPO Undertaking #2021-6585; 35278)(PDMC-PJ-09-NV-2018-001).

Dear Ms. Holm:

The Nevada State Historic Preservation Office (SHPO) has reviewed the subject documents received on March 7, 2024, in accordance with Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended.

Project Description:
The U.S. Department of Homeland Security, Federal Emergency Management Agency (FEMA) proposes to provide federal financial assistance under the Pre-Disaster Mitigation Grant Program to the State of Nevada, Public Works Division to support the Marlette Lake Dam Resilient Infrastructure Project that would support seismic safety improvements.

Area of Potential Effects (APE):
FEMA states that it identified the APE as the area within which the undertaking may directly or indirectly affect historic properties as defined in 36 CFR § 800.16(d) and this area is depicted on Attachment 1, Figure 1. The SHPO **agrees** with FEMA's conclusion that the APE is sufficient to address all the effects of the undertaking.

Identification and National Register of Historic Places (NRHP) Evaluation:
The SHPO **concurs** with FEMA's determination that the following property is not eligible for the NRHP under any of the Secretary of Interior's Significance Criteria:

26DO311.

The SHPO **concurs** with FEMA's determination that the following historic properties are eligible for the NRHP under the Secretary of Interior's Significance Criterion D:

26OR335/345 and 26WA2811/6930.

The SHPO is unable to review a FEMA opinion concerning the NRHP eligibility of the Marlette Dam, a contributing element to the Marlette Lake Water System National Register Historic District (NRIS #9200162). The process for modifying a NRHP listed historic property, such as the Marlette Lake Water System District, is found at 36 CFR § 60.14 and is more appropriately addressed outside of the Section 106 process.

If FEMA wishes to modify either a boundary of a NRHP listed property or revise the constituents that were previously identified as contributing when listed by the Keeper of the NRHP, FEMA must follow the process identified in the above cited regulation. Guidance on this process can be found in the National Park Service's Best Practices Review (Issue 3 | April 2023) at https://www.nps.gov/subjects/nationalregister/upload/BPR_additional-documentation-2023-04-12-FINAL.pdf or by consulting National Park Service staff.

The evidence provided by the submission does not present a compelling argument for modifying this NRHP listed district as its construction history and its integrity was documented during the listing process. Additionally, nothing in the report suggests that the dam's integrity has significantly changed since the listing in 1992 when the Keeper determined that the dam contributed to the eligibility of the district.

Finding of Effect:
FEMA determined that the subject undertaking will not pose an adverse effect on an historic property.

The SHPO is unable to agree with and must object to this finding of no adverse effect as the Marlette Dam remains a contributing element to the listed Marlette Lake Water System Historic District and the proposed undertaking will likely pose an adverse effect on this contributing element.

Sincerely,

Rebecca Lynn Palmer
State Historic Preservation Officer

(via email):
Bob Mergell, Administrator, Nevada Division of State Parks.
Charlie Donohue, Administrator, Nevada Division of State Lands.
Brian Wacker, Project Manager, Nevada Division of Public Works.

U.S. Department of Homeland Security
Region IX
1111 Broadway, Suite 1200
Oakland, CA 94607-4052

FEMA

IN REPLY REFER TO:
PDMC-PJ-09-NV-2018-001

April 16, 2024

Ms. Rebecca Palmer
Nevada State Historic Preservation Officer
State Historic Preservation Office
901 South Stewart Street
Carson City, NV 89701

Re: **Section 106 Continuing Consultation**
PDMC-PJ-09-NV-2018-001 (SHPO Undertaking #2021-6585; 35278)
Project: Marlette Lake Dam Resilient Infrastructure Project
Subapplicant: Nevada State Public Works Division
Determination: Finding of Adverse Effect and Proposed Mitigation

Dear Ms. Palmer:

The Federal Emergency Management Agency (FEMA) of the U.S. Department of Homeland Security proposes to provide federal financial assistance to the Nevada State Public Works Division (SPWD or Subapplicant) to stabilize the Marlette Lake Dam and reduce the hazards it poses to the downstream public and critical infrastructure. The project will be funded under FEMA's Pre-Disaster Mitigation Competitive (PDMC) grant program, and the funds will be administered through the Nevada Division of Emergency Management (NDEM or Applicant).

By letter dated March 5, 2024, FEMA requested concurrence from the Nevada State Historic Preservation Officer (SHPO) on the following:

- FEMA's delineation of the final project Area of Potential Effects (APE) (*see* **Attachment 1**).
- National Register of Historic Places (NRHP) eligibility recommendations and/or findings of effect for
    - Tunnel Creek Flume (26WA6929, also known as the Tahoe Flume Trail)
    contributing feature of the NRHP-listed Marlette Lake Water System National Register Historic District (NRIS #92001 62), no adverse effect;
    - North Canyon Road—South Section (260R346/D0751)
    eligible as a contributor to a potential historic district with Comstock-era and Basque sheepherding associations, no adverse effect;
    - North Canyon Road—North Section (260R347/WA6955)
    eligible as a contributor to a potential historic district with Comstock-era and Basque sheepherding associations, no adverse effect;
    - Glenbrook Railroad Grade (26D0605/OR247)
    eligible as a contributor to a potential historic district with Comstock-era associations, no adverse effect;

  - Marlette Lake Dam (260R393/WA6931)
    not eligible due to lack of integrity to the 1872-1887 period, no adverse effect;
  - Native American lithic scatter (26D0311, not relocated)
    not eligible, no adverse effect;
  - Marlette Station archaeological site (26WA2811/6930)
    eligible under Secretary of Interior's Significance Criterion D, no adverse effect with conditions; and
  - Overseas Chinese camp archaeological site (260R335 and 260R345)
    eligible under Secretary of Interior's Significance Criterion D, no adverse effect with conditions.
- Project Conditions to minimize possible impacts to archaeological resources through archaeological monitoring; tribal monitoring (if requested); use of temporary boundary fencing to protect Marlette Station (26WA2811/6930) and the Overseas Chinese camp archaeological site (260R335 and 260R345) and to define the limits of project ground disturbing activities; limits to vegetation management (e.g., limited tree trimming or flush cutting with no root ball removal); use of Best Management Practices (e.g., water trucks, spraying to limit dust emissions); and notification protocols for unanticipated discoveries.

In a response letter dated April 3, 2024, SHPO

- Agreed with FEMA's final delineation of the APE.
- Concurred with NRHP eligibility recommendations but provided no response on FEMA's findings of effect for
  - Native American lithic scatter (26D0311, not relocated);
  - Marlette Station archaeological site (26WA2811/6930); and
  - Overseas Chinese camp archaeological site (260R335 and 260R345).
- Provided no response on NRHP eligibility recommendations and findings of effect for
  - Tunnel Creek Flume (26WA6929, also known as the Tahoe Flume Trail);
  - North Canyon Road—South Section (260R346/D0751);
  - North Canyon Road—North Section (260R347/WA6955); and
  - Glenbrook Railroad Grade (26D0605/OR247).
- Declined concurrence with a finding of no adverse effect to Marlette Lake Dam (260R393/WA6931), noting that it remains a contributing element to the NRHP-listed Marlette Lake Water System Historic District (NRIS #92001 62), and the proposed Undertaking would likely pose an adverse effect on this contributing element of the system.
- Provided no response on proposed Project Conditions.

Following the April 3, 2024, response from SHPO, FEMA is seeking to continue consultation with your office on the proposed Undertaking pursuant to the 2023 Programmatic Agreement (Agreement) among FEMA, SHPO, and NDEM. FEMA has reviewed the proposed Undertaking in accordance with the Agreement as well as SHPO's comments and respectfully requests your concurrence with FEMA's **Finding of Adverse Effect and Proposed Mitigation** with revised determinations of effect for Marlette Lake Dam (260R393/WA6931) and North Canyon Road—North Section (260R347/WA6955).

As presented in FEMA's March 5, 2024 letter, FEMA also requests your concurrence with eligibility recommendations and findings of effect for Tunnel Creek Flume (26WA6929), North Canyon

Road—South Section (260R346/D0751), and Glenbrook Railroad Grade (26D0605/OR247) as well as proposed Project Conditions.

FEMA's March 5, 2024 letter (without Attachments) is included for reference as **Attachment 2**, and SHPO's April 3, 2024 response is included as **Attachment 3**.

Project Location
Marlette Lake Dam is an earthen-filled dam located along Marlette Creek in Washoe County on the east side of the Lake Tahoe basin (39.172864, -119.907403). The dam is part of the historic Marlette Lake Water System, a National Register Historic District (NR#920001162) and National Civil Engineering Landmark. Originally developed in the 1870's, the system supplies water to Virginia City, Silver City, Gold Hill, and Carson City. The system includes Marlette Lake, Hobart Reservoir, and a system of flume alignments and pipelines that transport an average of 16,925-acre feet/year of water.

Marlette Lake Dam is in a high seismic hazard area and is classified as a "High Hazard Dam" in the National Inventory of Dams maintained by the U.S. Army Corps of Engineers. Annual inspections indicate a high probability of a dam breach following an earthquake of 6.5 magnitude or greater, and seepage at the downstream toe of the dam along the primary outlets also increases the risk of dam failure. A dam breach would cause substantial damage to the dam itself and to downstream infrastructure such as Nevada State Route 28 and a sewage effluent pipeline that runs under the road. A dam breach could jeopardize health and human safety to downstream communities, while also negatively impacting the ecology and water quality of Lake Tahoe. **Attachment 1** contains project location and APE maps.

Undertaking
The Marlette Lake Dam is owned by the State of Nevada and is part of the Lake Tahoe-Nevada State Park in the Lake Tahoe Basin. It was originally constructed beginning in 1873 and consists of a stone masonry structure and earthen embankment that retains Marlette Creek. It has been modified twice, most recently in 1959 to raise the height of the dam. The current dam is approximately 52-feet high, with a crest length of approximately 250-feet and a width of approximately 13-feet at the dam crest. The reservoir created by the dam has a storage capacity of roughly 11,780 acre-feet of water. There is one concrete lined spillway on the north side of the dam and one outlet pipe with a manual control on the top of the dam. The spillway discharges to Marlette Creek, which flows under State Route 28 via an existing box culvert and then to Lake Tahoe. The outlet pipe historically discharged to a flume that moved water to Virginia City and Carson City via a tunnel through the mountain. After a cave-in at the tunnel, the flume was abandoned, and the outlet pipe now discharges to Marlette Creek.

The ninety-percent design for the project calls for (1) stabilizing the existing dam embankment structure; (2) replacing the emergency spillway; (3) improving operational outlets; and (4) raising the access road adjacent to the dam. Stabilizing the existing structure would involve enlarging the downstream embankment with imported fill material for lateral support and establishing a two-stage toe drain, which would extend the toe of the dam an additional 48 feet. The dam height would be raised approximately 3 feet to address freeboard deficiencies. The existing concrete spillway would be removed and replaced with a new concrete box culvert and spillway. The existing primary outlet piping within the dam, which is currently corroding, would be replaced with new outlet pipe via

open cut excavation. A 10-foot by 10-foot masonry building would be constructed on the dam crest to house new controls for the outlet piping. Marlette Creek would be re-graded at the outlet and a riprap stilling basin constructed. Riprap would be placed along the upstream crest of the dam and the embankment between the lake and access road to control for erosion. Full design drawings for the project were included in FEMA's March 5, 2024 submittal and are not replicated here.

Dewatering and Cofferdam Installation and Removal

Replacing the outlet pipe will require dewatering Marlette Lake reservoir to approximately 22 feet below the spillway crest. The lake will be lowered using the existing primary outlet, with a proposed maximum release of 25-cubic-feet per second (cfs) discharge to protect downstream habitat along Marlette Creek. Drawdown of the reservoir would occur over the course of several months, with a proposed start date in September 2024. Dewatering measures would use existing facilities, and water releases would be limited to flows less than or equal to downstream conveyance system capacities. The drawdown is expected to be completed by the Spring of 2025. After construction, the reservoir would be allowed to recharge naturally.

Access Roads

Construction equipment would access the dam using North Canyon Road, a maintained 15-foot-wide access road that runs south to north from Spooner Lake off State Route 28 near the intersection of US 50 (Lincoln Highway). At the south end of Marlette Lake, North Canyon Road transitions into the Tahoe Flume Trail, a gravel access road to the dam site. Use of North Canyon Road for access would require some tree and brush trimming and the improvement of several pullouts. A section of North Canyon Road/Tahoe Flume Trail northeast of the dam site would be re-graded and raised approximately 5 feet to accommodate a temporary truck turnaround. During project construction, North Canyon Road would be temporarily closed to the public for safety considerations. Following construction, the road would be restored to pre-project conditions, however the elevated portion of the road would remain to accommodate the new dam crest height.

Area of Potential Effect

As defined in 36 CFR §800.16(d), the APE is the geographic area or areas within which an undertaking may directly or indirectly cause changes in the character or use of historic properties. This includes (a) the proposed work areas centered on the Marlette Lake Dam; (b) parking, storage, and staging areas; (c) pullouts; (d) access roads; (e) and the proposed lake drawdown area. Maps of the APE are included in **Attachment 1**.

The vertical APE, or the depth of proposed ground disturbing activities, is expected to range from up to (a) 7 feet to replace weathered material along Marlette Lake Dam with imported fill material; (b) 7 feet to replace the existing concrete emergency spillway with the new concrete box culvert; (c) 12 inches for grading and vegetation clearance along the North Canyon Road/Tahoe Flume Trail adjacent to the dam; and (d) 4 feet for grading at the creek outlet to construct the riprap stilling basin. A trench would be cut, bisecting the middle of the dam, to a depth of approximately 50 feet to access the existing outlet pipes running through the bottom of the dam. Staging and construction access are expected to result in minimal or no ground disturbance, as North Canyon Road is maintained and of sufficient width to allow equipment access.

Identification and Evaluation

Marlette Lake Dam (260R393/WA6931)

Marlette Lake Dam (260R393/WA6931) is a combination stone masonry and earthen embankment dam that impounds water from Marlette Creek and other tributaries to form Marlette Lake. The dam is at the end of North Canyon Road within an inlet on the west side of the reservoir and has a roughly east-west alignment. Originally built in 1873, the dam was enlarged in 1875 as a stone masonry structure, but this structure was almost completely buried in 1959 by the current earthen embankment. A roughly 100-foot-long portion of the earlier stone masonry structure is just visible on the downslope (south) side of the embankment, approximately 36-feet below the current crest of the dam. The old dam remnant is a slightly curved wall of unmortared stacked stone. The wall ranges from three to six courses and 3 to 4 feet in height. Attached to the west end of the earth embankment dam is a concrete spillway that also was built in 1959.

Marlette Lake Dam was listed in the NRHP in 1992 as a contributing feature of the Marlette Lake Water System Historic District (260R393/WA6931) with a nineteenth and twentieth century period of significance. In evaluating the dam as part of the Undertaking, SPWD's Qualified contractor JRP Historical Resources, LLC. (JRP) concluded that the dam had been substantially modified with the addition of the earthen embankment in 1959 and does not possess integrity to its original nineteenth century appearance. They argued that while the dam retains integrity of location, setting, feeling, and association, substantial changes to the structure itself have significantly altered its integrity of design, workmanship, and materials and have therefore compromised the dam's integrity to the Marlette Lake Water System's period of development. The latest recordation of Marlette Lake Dam was included in JRP's (2023) *Built Environment Evaluation Report: Section 106 of the National Historic Preservation Act Compliance for the Marlette Lake Dam Resilient Infrastructure Project, Washoe County, Nevada,* which was Attachment 5 to FEMA's March 5, 2024 letter.

However, according to the 1992 NRHP Nomination Form, the "Marlette Lake Water System, although altered several times since its origin 1873, retains its original configuration" (Abbe 1992:2).

> By 1887 the system could produce 10,000,000 gallons of water per day. From 1887 to 1941 the system received normal maintenance and that was about all. The major alterations to the system have occurred since 1941, with most of these occurring since the mid-1950s. Since purchase of the system by the state in 1963, it has undergone major changes, but the basic plan established in 1872 is still being used, as are parts of the original pipelines of 1873, 1875, and 1887. A testimonial to the greatness of the idea is that the system still provides all of Virginia's City's water and it also supplies a minimum of 3,000,000 gallons a day to Carson City. Although construction materials have changed, the basic plan and structure of the system is still functioning over a century after the initial system was completed (Abbe 1992:5-6).

The Marlette Lake Water System Historic District (260R393/WA6931) thus retains its importance not only as a nineteenth century water conveyance and storage system, but also as one that has persisted through the twentieth century and beyond, functioning in much the same way and supplying the same purpose and need even as individual components have been replaced or upgraded. The full NRHP Nomination Form for the Marlette Lake Water System is included as Attachment 4.

The Undertaking calls for stabilizing the existing dam embankment by replacing weathered material along the dam with imported fill, replacing the existing spillway with a new concrete box culvert, installing a new riprap stilling basin, replacing the existing outlet with a new outlet, establishing a two-stage toe drain that would extend the toe of the dam 48 feet, raising the dam approximately 3 feet for added freeboard, placing riprip along the upstream crest of the dam and embankment between the lake and adjacent access road, and installing a new 10-foot by 10-foot masonry building on the dam crest to house new outlet piping controls.

Although Marlette Lake Dam would remain a functioning part of the Marlette Lake Water System Historic District (260R393/WA693) after project modifications are completed, the proposed seismic safety improvements would permanently and physically alter the dam from its 1959 construction as captured in the 1992 Historic District Nomination Form. Therefore, FEMA concurs with SHPO that the Undertaking will have an adverse effect on the historic property per 36 CFR §800.5(a)(2)(i).

North Canyon Road—North Section (260R347/WA6955)

North Canyon Road consists of a graded dirt road between Spooner Meadow and Marlette Lake that was first established ca. 1860. Prior recordation efforts divided it into a North Section (26OR347/WA6955) and South Section (OR346/DO751), divided at the pass that separates North Canyon from Marlette Basin. As recorded, the road includes the Flume Trail on the western shore of Marlette Lake, terminating at the dam crest. The northwest end of the road at Marlette Lake Dam was constructed prior to the final raising of the dam crest in 1959, and thus a portion of the road segment is now periodically inundated. North Canyon Road varies from 10 to 15 feet in width and generally follows surface topography with limited areas of cut and fill. Modern culverts have been installed along North Canyon Road within the past several decades as well as several small drainage ditches lined with rock constructed in the Spooner Meadow area. The road is also regularly maintained and graded and shows little erosion or heavy wear. North Canyon Road has been recommended as eligible for listing in the NRHP as a contributor to a potential historic district with both Comstock-era and Basque sheepherding associations (JRP 2023). The latest recordation of North Canyon Road was included in JRP's (2023) *Built Environment Evaluation Report: Section 106 of the National Historic Preservation Act Compliance for the Marlette Lake Dam Resilient Infrastructure Project, Washoe County, Nevada,* which was presented as Attachment 5 of FEMA's March 5, 2024 submittal.

The Undertaking calls for regrading a portion of North Canyon Road—North Section (260R347/WA6955) closest to the dam and raising it by 5 feet using fill materials to accommodate a temporary truck turnaround. No additional segments of the road would be altered, and the use of North Canyon road by vehicles and heavy equipment is not expected to damage it. Should damage occur, it would be temporarily stabilized by adding a 3-6-inch thick aggregate base layer to prevent excessive rutting and erosion. Stabilized areas would be restored to pre-project conditions after construction is complete consistent with the Secretary of the Interior's Standards for the Treatment of Historic Properties, however the elevated portion of the road would remain to accommodate the increased height of the dam.

The elevation of a portion of North Canyon Road—North Section (260R347/WA6955) closest to the dam would be completed using fill materials consistent with the current alignment, however it would alter the appearance of the road even as it allows for its continued use and functionality. These

permanent modifications to the road, though necessary, would be considered an adverse effect consistent with 36 CFR §800.5(a)(2)(ii).

Application of the Criteria of Adverse Effect
The Undertaking will directly affect Marlette Lake Dam (260R393/WA6931), a contributing element of the Marlette Lake Water System Historic District (260R393/WA6931), by altering the physical characteristics that characterized the dam and its appurtenant features when the District was listed in the NRHP. Similarly, elevating the portion of North Canyon Road—North Section (260R347/WA6955) closest to the dam will alter the physical appearance of a resource that has been recommended as a contributing element to a potential historic district composed of the road networks of the North Canyon and Marlette Basin. For the purposes of this consultation letter, FEMA is assuming SHPO concurrence with this determination of eligibility. These alterations to the Marlette Lake Dam (260R393/WA6931) and North Canyon Road—North Section (260R347/WA6955) would result in an **Adverse Effect** to historic properties as defined in 36 CFR §800.5(a)(2).

As required by Stipulation II.C.6 of the Agreement, FEMA is submitting this finding of Adverse Effect for the proposed Undertaking and is requesting SHPO concurrence. FEMA is also concurrently submitting proposed mitigation or treatment measures as permitted under Stipulation VII.C.

Proposed Mitigation
In consultation with NDEM and SPWD, FEMA proposes to resolve adverse effects to the Marlette Lake Dam (260R393/WA6931) and a portion of North Canyon Road—North Section (260R347/WA6955) through implementation of the Abbreviated Consultation Process described under Stipulation II.C.6.a of the 2023 Agreement. Specifically, FEMA proposes implementation of Appendix C Treatment Measure A.1, or the further recordation of the Marlette Lake Dam (260R393/WA6931) and its appurtenant features and North Canyon Road—North Section (260R347/WA6955) through production of a digital photography package. This package would be prepared by a Secretary of the Interior Qualified Architectural Historian from JRP retained by SPWD. The digital photography package will meet the standards cited in the National Park Service (NPS) *National Register Photo Policy Factsheet updated 5/15/2013* Interim National Register Photo Policy Factsheet (nps.gov).

Photographs will include full oblique and contextual images. The digital photography package will contain a comprehensive collection of photographs including representative overviews and close-up views of the upstream and downstream faces of Marlette Lake Dam (260R393/WA6931); appurtenant elements of the dam such as the spillway, outlet, and control features; and the area where 1959 dam construction subsumed the location of the Tunnel Creek Flume (26WA6929) within the APE. These photographs will highlight the current condition and significant features of the property and will be supplemented by historical photographs taken prior to and following changes made to the dam in 1959. Photographs of the northern portion of North Canyon Road—North Section (260R347/WA6955) will include representative views along of the full length of the road focusing on the portion of the road adjacent to the dam that would be permanently elevated. All photographs taken will be keyed to a site plan and indexed according to the date photographed, site number, site name, site address, direction, frame number, subject matter, and photographer's name recorded on the reverse side in pencil.

The digital photography package will include.

- Printed color copies of the digital photographs (on appropriate paper, per the NPS *National Register Photo Policy Factsheet updated 5/15/2013)*;
- A CD/DVD of the digital photographs;
- Completed state architectural inventory forms for Marlette Lake Dam (260R393/WA6931) and North Canyon Road—North Section (260R347/WA6955) submitted with FEMA's March 5, 2024 letter; and
- A written site history of each property.

The digital photography package will be produced in May or June of 2024 and submitted by FEMA to SHPO for review and approval prior to grant award and project implementation. Within 60 days of approval by SHPO, FEMA will submit one copy of the approved documentation to a state or local historical society, archive, and/or library for permanent retention. FEMA anticipates the digital photography package will be submitted to the Nevada Historical Society in Reno, which has approximately 500,000 photographs dating from 1862 to the present and an extensive collection of Comstock-era images.

In a letter dated March 25, 2024, FEMA proposed a phased protocol consistent with 36 CFR §800.4(b)(2) to complete identification and evaluation efforts for areas that would be exposed following the partial drawdown of Marlette Lake reservoir to install a temporary coffer dam. These efforts would be incorporated as a condition of the project grant and provided for in the project Environmental Assessment. As a part of the post-drawn down survey, FEMA proposes that additional digital photographs be taken of exposed portions of the dam and its key elements using the protocol described above. These will be submitted to the SHPO for review and approval as an addendum to the digital photography package and submitted to the same state or local historical society, archive, and/or library for permanent retention within 60 days of approval by the SHPO. Due to the narrow window of time between completion of the drawdown and implementation of project construction, FEMA proposes that construction be allowed to proceed prior to final approval by the SHPO of the addendum digital photography package. FEMA's March 25, 2024 letter (without Attachments), which is pending SHPO's response, is included as Attachment 5 for reference.

Conclusion

Following your April 3, 2024, comments, FEMA is respectfully seeking your review and concurrence with FEMA's **Finding of Adverse Effect and Proposed Mitigation** under an Abbreviated Consultation Process for Marlette Lake Dam (260R393/WA6931) and North Canyon Road—North Section (260R347/WA6955). FEMA requests your concurrence with eligibility recommendations and findings of effect for Tunnel Creek Flume (26WA6929), North Canyon Road—South Section (260R346/D0751), and Glenbrook Railroad Grade (26D0605/OR247) as well as your approval of the Project Conditions presented in FEMA's March 5, 2024, letter. FEMA also looks forward to your response on our March 25, 2024 correspondence focused on proposed phased identification and evaluation efforts associated with the drawdown of Marlette Lake. Should you have any questions or comments, please do not hesitate to contact Lisa Holm at (202) 803-3839, lisa.holm@fema.dhs.gov, or the letterhead address.

Sincerely,

Lisa Holm
Senior Environmental Protection Specialist
for Regional Environmental Officer
FEMA Region IX

References

Abbe, Don (1992) National Register of Historic Places Inventory – Nomination Form: Marlette Lake Water System. NRIS Reference Number:92001162, September 16, 1992. US Department of the Interior, National Park Service.

JRP Historical Consulting, LLC (JRP) (2023) Built Environment Evaluation Report: Section 106 of the National Historic Preservation Act Compliance for the Marlette Lake Dam Resilient Infrastructure Project, Washoe County, Nevada. Submitted to Lumos & Associates on behalf of Nevada State Public Works Division.

Attachments

Attachment 1: Project Location and Area of Potential Effect Maps
Attachment 2: FEMA Correspondence dated March 5, 2024 (Section 106 Continuing Consultation, Marlette Lake Dam Resilient Infrastructure Project, No Adverse Effect (with Conditions)
Attachment 3: NV SHPO Response dated April 3, 2024 (SHPO Undertaking #2021-6585; 35278)
Attachment 4: National Register of Historic Places Inventory – Nomination Form: Marlette Lake Water System
Attachment 5: FEMA Correspondence dated March 25, 2024 (Section 106 Continuing Consultation, Marlette Lake Dam Resilient Infrastructure Project, Phased Identification and Evaluation Proposal

NEVADA
STATE HISTORIC
PRESERVATION OFFICE

STATE OF NEVADA
Department of Conservation and Natural Resources

Joe Lombardo, *Governor*
James A. Settelmeyer, *Director*
Rebecca L. Palmer, *Administrator*

May 16, 2024

Lisa Holm
Senior Environmental Protection Specialist
Federal Emergency Management Agency, Region IX
1111 Broadway Suite 1200
Oakland CA 94607-4052

RE: Marlette Lake Dam Resilient Infrastructure Project, Washoe and Douglas Counties (SHPO Undertaking #2021-6585; 35373)(PDMC-PJ-09-NV-2018-001).

Dear Ms. Holm:

The Nevada State Historic Preservation Office (SHPO) has reviewed the subject documents received on April 17, 2024, in accordance with the Stipulation II.C.6 of the Programmatic Agreement (PA) titled *Programmatic Agreement among the Federal Emergency Management Agency, the Nevada State Historic Preservation Officer, and the Nevada Division of Emergency Management* (2023).

Although not necessary for compliance with the PA since the Keeper of the National Register of Historic Places (NRHP) has issued the final opinion with the listing, the SHPO concurs with the Federal Emergency Management Agency's (FEMA) finding that the following historic property remains a contributing element to the Marlette Lake Water System National Register Historic District (NRIS #9200162):

Tunnel Creek Flume (26WA6929).

The SHPO previously concurred (8/28/2014) that the following historic properties are eligible for the NRHP under the Secretary of Interior's Significance Criterion A as contributing elements to a potential NRHP historic district and reiterates its concurrences here:

North Canyon Road – South Section (260R346/D0751)
North Canyon Road – North Section (260R347/WA6955).

The SHPO previously concurred (9/4/2020) that the following historic property is eligible for the NRHP

under the Secretery of Interior's Significance Criteria A and C as a contributing element to a potential NRHP historic district and reiterates its concurrence here:

Glenbrook Railroad Grade (26D0605 / OR247).

The SHPO **concurs** with FEMA's finding of **Adverse Effect** for the subject undertaking. The SHPO also concurs that FEMA's determination that the proposed mitigation described in the federal agency's letter of April 16, 2024 (received April 17, 2024) on pages 7 and 8 meets the requirements of Stipulation II.C.6.a.i and the minimum documentation found in Appendix C.A.1 "Digital Photography Package".

The SHPO does not agree with FEMA's proposal to execute a Memorandum of Agreement (MOA) to memorialize the proposed "Project Conditions" found in its letter of March 28, 2024. However, the SHPO would concur with a FEMA determination that the proposed activities described on pages 4-6 constitute a "agreeable action plan (with timeframes)" required under Stipulation III.B.1.d.i and should be made a condition of the grant.

We have no further comments on this undertaking. We look forward to receiving the mitigation products for review.

Sincerely,

Rebecca Lynn Palmer
State Historic Preservation Officer

(via email):
Bob Mergell, Administrator, Nevada Division of State Parks.
Charlie Donohue, Administrator, Nevada Division of State Lands.
Brian Wacker, Nevada Division of Public Works.

United States Department of the Interior

Pacific Southwest Region
FISH AND WILDLIFE SERVICE
Reno Fish and Wildlife Office
1340 Financial Boulevard, Suite 234
Reno, Nevada 89502

December 28, 2023
File No. 2022-0079054
Sent Electronically

Lisa Roberts
Senior Biologist
Federal Emergency Management Agency, Region 9
Department of Homeland Security
1111 Broadway, Suite 1200
Oakland, California 94607

Subject: Biological Opinion for the Marlette Lake Dam Resilient Infrastructure Project (Pre-Disaster Mitigation Contracts (PDMC)-PJ-09-NV-2018-001)

Dear Lisa Roberts:

This document transmits the U.S. Fish and Wildlife Service's (Service) biological opinion based on our review of the Federal Emergency Management Agency's (FEMA) proposed financial assistance, through the Pre-Disaster Mitigation (PDM) Grant Program, for the Marlette Lake Dam Resilient Infrastructure Project and its effects on the federally listed as threatened Lahontan cutthroat trout (LCT; *Oncorhynchus clarkii henshawi*), in accordance with section 7 of the Endangered Species Act of 1973, as amended (Act) (16 U.S.C. 1531 *et seq.*). We received your request for formal consultation on July 21, 2023.

We have based this biological opinion on your July 21, 2023, letter requesting consultation and the biological assessment (BA) (FEMA 2023) for the proposed action which accompanied it.

CONSULTATION HISTORY

The lead action agency for this consultation is FEMA. They began initial coordination for this consultation on April 13, 2022, by hosting a teleconference with the Service's Reno Fish and Wildlife Office (RFWO) and other stakeholders to introduce the proposed action and discuss potential impacts. On July 7, 2022, FEMA hosted a second teleconference to clarify the proposed action, establish which federally listed species were likely to be affected, and discuss the consultation process and timeline with RFWO staff and other stakeholders. On December 13, 2022, a final teleconference was held to gather additional information related to stakeholder concerns and ensure FEMA's contractor, CDM Smith, had all the necessary information to develop the biological assessment (FEMA 2023). Formal consultation with the RFWO was

requested by FEMA on July 21, 2023. A phone call between FEMA and RFWO staff was held on November 17, 2023, and an email exchange on December 8, 2023.

BIOLOGICAL OPINION

DESCRIPTION OF THE ACTION AREA AND PROPOSED ACTION

Action Area

Regulations implementing the Act (50 CFR § 402.02) describe the action area as all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action. The proposed action area was defined by FEMA as Marlette Lake, its earthen-filled dam and upstream and downstream embankments, the concrete spillway, and several existing roads within the area that will be used for various purposes. However, LCT currently only exist within Marlette Lake, and thus can only be affected by project-related activities that occur in and directly adjacent to the lake itself (*i.e.*, the dam, spillway, embankments, immediately adjacent access roads) since all other proposed actions will occur along the road that leads to Marlette Lake from nearby Spooner Lake to the south. Thus, for this consultation, the action area is Marlette Lake, the dam construction area, the storage and stockpiling area near Nevada Department of Wildlife's (NDOW) spawning station, and the portion of the Tahoe Flume Trail that will be used to access the dam construction area adjacent to the lake. Marlette Lake is approximately 1 mile east of Lake Tahoe in the Tahoe LCT Management Unit (Figure 1).

Figure 1. Map depicting the location of Marlette Lake within the Tahoe LCT Management Unit, as well as other LCT occupied habitats within the unit.

Proposed Action

The proposed action is to retrograde Marlette Lake's existing earthen dam structure to improve its ability to withstand larger seismic events. The proposed action includes several activities, including enlarging the downstream embankment of the dam and adding a toe drain, removing and replacing the existing riprap protection on the upstream slope of the dam, removing and replacing the concrete spillway associated with the dam, and upgrading intake/outlet structures and piping (FEMA 2023). Enlarging the downstream embankment of the dam would require heavy equipment (*i.e.*, CAT 966, D6, 330, 345, or equivalent) to first remove vegetation on the dam and its embankments to allow access. Next, all soil and loose, weathered, oversized rock material along the downstream embankment would be removed down to dense bedrock material, including the existing boulder wall about halfway down the dam face. Then, approximately 2,860 cubic yards of new buttress fill would be placed in the excavated embankment (replacing the removed material) and compacted in lifts to achieve a grade of 3:1. The new fill would extend downstream 48 feet further than the embankment's current footprint. The new two-stage toe drain would be installed under the new downstream fill. To remove and replace the upstream embankment slope riprap protection, heavy equipment will first excavate the existing material. Once excavated, new riprap protection will be placed and compacted at the same slope as the current embankment.

Additional operational outlet improvements would also occur as part of this proposed action. First, the existing spillway would be completely removed by heavy equipment and replaced with a new concrete box culvert that is within basically the same footprint (11 feet wide by 6 feet tall by 78 feet long) and at the same slope; after removal of the existing spillway, the soil would be excavated an additional 12 inches to accommodate a compacted aggregate base for the culvert to rest upon. Lastly, all existing outlet pipes within the dam would be completely replaced and updated with new ones during embankment work, including the addition of an automated outlet control system to be housed in a 10-foot by 10-foot masonry building on the dam crest. Because the new outlet pipes will have water exiting the lake onto a different portion of Marlette Creek (48 feet further downstream than today), the creek would be regraded to facilitate the construction of a riprap stilling basin to dissipate erosive flows. As well, the new intake for the outlets would be replaced with an elevated trash rack to prevent siltation.

All of these proposed activities would occur in a dry forebay work area, disconnected from the lake and its inhabitants, and for the most part are the direct removal and replacement of existing infrastructure (except for the addition of the toe drain in the enlarged downstream dam embankment and creek stilling basin). To complete the dam retrograde, the water level in Marlette Lake will need to be reduced to 22 feet below the spillway crest (full lake level), dropping the lake's water level to approximately 7,820 feet above mean sea level (AMSL). This would reduce the lake's volume by over 52 percent of the normal approximately 10,000 acre-feet to an estimated 4,750 acre-feet. Dewatering is proposed to begin in October 2024, at which time the lake should be at the seasonally low water level of 7,837 feet AMSL. Dewatering would slowly occur over several months, by discharging lake water through the existing primary outlet at a rate not to exceed 25 cubic feet per second, to reduce downstream impacts.

Once the lake is dewatered to 7,820 feet AMSL, a large sediment bar would be exposed about 230 feet northeast of the dam, providing a foundation for the installation of a water-filled

cofferdam; this is expected to occur by March 2025. Silt screens and other sediment-reducing activities (like slowly pumping water out of the forebay work area) are proposed ahead of the cofferdam installation to reduce impacts to fish remaining in Marlette Lake. This cofferdam would then allow for the further dewatering of the forebay work area (theoretically, without further dewatering of the lake itself) another 15 feet or so to completely expose the forebay work area. During forebay dewatering activities, qualified NDOW biologists are proposing to conduct fish capture and relocation of LCT and other entrained trout to reduce mortality. Once the forebay work area is completely dewatered, construction activities on the dam would begin; these activities would have little to no effect on the fish remaining in Marlette Lake because they have little to no chance of introducing contaminants or sediment to the lake itself due to the proposed best-management practices and because the work area would be dry and disconnected from the lake itself.

Timeline

The proposed action would begin in October 2024, with the slow dewatering of Marlette Lake throughout the fall and winter. In March 2025, a cofferdam would be installed to isolate the forebay work area, and through May 2025, the forebay work area would be dewatered to allow access to the dam's intake/outtake structures, embankments, and spillway. Construction activities on the dam are proposed to start in May 2025 and be completed by October 2025, at which time the forebay work area would be allowed to naturally refill. Once the forebay work area is refilled, the cofferdam would be removed slowly to reduce sedimentation and the retrograded Marlette Lake Dam outlet structure would be closed. This would result in Marlette Lake naturally refilling through time back up to the Dam's spillway crest; it is estimated that it may take up to 6 years to completely refill.

Section 2.4 Best Management Practices and 2.5 Specific Measures for Lahontan Cutthroat Trout in the BA (FEMA 2023) outline the best management practices (BMPs) that would be incorporated as part of the proposed action to minimize impacts to LCT. These are:

To minimize soil erosion and protect water quality, BMPs would be implemented in accordance with the Tahoe Regional Planning Agency Handbook of Best Management Practices. A Stormwater Pollution Prevention Plan also would be prepared by a qualified professional, which would include BMPs and monitoring of BMP efficacy throughout construction. BMPs for the protection of soil and water resources would include:

• BMP 1. Boundary fencing (*i.e.*, orange construction fencing or highly visible rope fencing) will be placed and maintained to clearly identify the limits of site grading, equipment staging and material stockpiling areas, and identified pullouts to protect adjacent vegetation.

• BMP 2. Excavated soils will be stockpiled temporarily within previously disturbed, upland staging areas or immediately off loaded into a haul truck. Sediment barriers will be placed around the downslope perimeter of temporary soil stockpiles.

• BMP 3. Sediment barriers will be placed around the downslope side of loose/erodible cut/fill slopes along the base of the dam embankment and at temporary road pullouts/staging areas to prevent sediment from washing into Marlette Creek.

• BMP 4. Sediment barriers will be inspected weekly for damage and appropriate placement to reduce potential erosion. Any damaged barriers will be repaired, or new barriers installed, within 24 hours upon identification of damage. Accumulated sediment will be removed when it reaches a maximum of one-third the height of the silt fence or one-half the height of the fiber roll.

• BMP 5. Work within regulated waters will be completed under low flow or no flow conditions. Water levels within the lake will be lowered via the existing outlet works prior to construction. A temporary hydraulic cofferdam will then be installed within Marlette Lake and water will be pumped around the cofferdam such that the replacement of the intake structures and work on the dam can occur in a dry environment.

• BMP 6. A turbidity curtain will be deployed up-gradient of the cofferdam to contain any turbidity caused by cofferdam installation.

• BMP 7. All upland areas temporarily disturbed by construction activities will be revegetated in accordance with the Tahoe Regional Planning Agency Best Management Practices Handbook.

• BMP 8. Staging and storage of equipment, materials, fuels, lubricant, and solvents will be located more than 100 feet from aquatic resources, including wetlands and lakes. Equipment will be fueled and maintained within the designated staging areas. Adequate supplies will be available at all times to handle spills, leaks, and disposal of used liquids.

• BMP 9. Loose construction materials, packaging, and litter will be cleaned up daily and disposed of or stored appropriately.

• BMP 10. All ground-disturbing activities will be effectively controlled of fugitive dust emissions using various methods.

Additionally, the following BMPs will be implemented to protect biological resources:

• BMP 11. If vegetation removal is scheduled during the nesting season (March 1 to August 31), a focused survey for nests will be completed by a qualified wildlife biologist at a minimum radius of 500 feet for migratory birds and 0.5 mile for raptors around the project area. If active nests are found, the nest will be avoided and a disturbance buffer established by the project biologist in coordination with NDOW. The extent of the buffer will be dependent on the species, noise levels or construction disturbance, and other topographical or artificial barriers. The buffer will be kept in place until the nesting season ends or the project biologist confirms the young have fledged.

• BMP 12. A screen-covered drafting box will be used while drafting or dewatering to minimize removal of aquatic species, including juvenile fish, from aquatic habitats. The pump intake screens will be sized according to the pump intake capacity and approved by an NDOW fisheries biologist.

• BMP 13. NDOW will perform any fish salvage procedures necessary before and/or during the dewatering of the waterward side of the dam (*i.e.,* the forebay work area).

• BMP 14. Tightly woven fiber netting, plastic monofilament netting or similar material will not be used for erosion control or other purposes adjacent to aquatic resources, including wetlands.

• BMP 15. Vegetation removal will be minimized to the extent practicable. Where necessary within the construction access corridor and at designated passing areas, existing vegetation will be trimmed to a height necessary for construction equipment while keeping the existing plants alive. Vegetation within equipment access areas that could pose a fire danger if left in place will be removed.

• BMP 16. All construction equipment and vehicles will be washed and inspected for weed seeds and plant parts prior to bringing them onto the property. Vehicles or other traffic that may transport weed seed or plant materials will be restricted from entering the site.

• BMP 17. Certified weed-free mulch will be used for all site restoration areas.

• BMP 18. Infestations of invasive plants that are discovered during project implementation will be documented and locations mapped.

• BMP 19. To the maximum extent practicable, project-related vehicles will observe a 15-mile-per-hour speed limit within construction areas and on access roads.

• BMP 20. All food and food-related trash items will be enclosed in sealed trash containers and properly disposed of off-site.

• BMP 21. No pets will be allowed anywhere within the action area (AA) during project implementation.

• BMP 22. To the maximum extent practicable, construction and ground disturbance will occur only during daytime hours, and will cease no less than 30 minutes before sunset and will not begin again earlier than 30 minutes after sunrise.

In addition to the BMPs indicated above, the following species-specific measures would be incorporated into the Proposed Action to minimize potential impacts on LCT:

• LCT 1. In coordination with the Service and NDOW, the Subapplicant will facilitate the collection and relocation of LCT from Marlette Lake prior to reservoir drawdown. This will reduce the number of fish that would be subject to stressors associated with post-drawdown conditions. Capture and relocation activities will only be conducted by Service-approved biologists and support staff with knowledge and experience in handling, collecting and relocating LCT. No collection and relocation of LCT will occur following reservoir drawdown because resultant access limitations would preclude such activities.

• LCT 2. During dewatering and rewatering of the forebay work area, the following measures will be implemented to minimize the contribution of turbidity to Marlette Lake:

    o Suspended sediment in water pumped or removed from the dewatered forebay work

area will be filtered or allowed to settle before its release or allowed to filter through vegetated upland areas prior to being returned to the lake.

o When construction is complete, the forebay area will be rewatered slowly by methodically pumping water from the lake to the dewatered work zone This will be performed in a manner that will avoid abrupt flows and turbidity. Once the water elevation is level on both sides of the cofferdam, the cofferdam will be removed.

ANALYTICAL FRAMEWORK FOR THE SECTION 7(a)(2) DETERMINATIONS

Jeopardy Determination

Section 7(a)(2) of the Act requires that Federal agencies ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of listed species. "Jeopardize the continued existence of" means "to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species" (50 CFR 402.02).

The jeopardy analysis in this biological opinion relies on four components: (1) the Status of the Species, which describes the current rangewide condition of LCT, the factors responsible for that condition, and its survival and recovery needs; (2) the Environmental Baseline, which analyzes the condition of LCT in the action area, the factors responsible for that condition, and the relationship of the action area to the survival and recovery of LCT; (3) the Effects of the Action, which determines all consequences to LCT caused by the proposed action that are reasonably certain to occur in the action area; and (4) the Cumulative Effects, which evaluates the effects of future, non-Federal activities, that are reasonably certain to occur in the action area, on LCT.

In accordance with policy and regulation, the jeopardy determination is made by evaluating the effects of the proposed Federal action in the context of the current status of LCT, taking into account any cumulative effects, to determine if implementation of the proposed action is likely to reduce appreciably the likelihood of both the survival and recovery of LCT in the wild by reducing the reproduction, numbers, and distribution of that species.

STATUS OF THE SPECIES

On October 13, 1970, LCT were federally listed as endangered under the Endangered Species Conservation Act of 1969 (Service 1970). On July 16, 1975, LCT were reclassified as threatened under the ESA in conjunction with a special 4(d) rule to facilitate management by the states and allow state-permitted sport harvest (Service 1975). The 4(d) rule for LCT exempts the take of LCT from the section 9 prohibitions of the ESA when such take is in accordance with applicable state law (50 § CFR 17.44(a)(1)). Critical habitat has not been designated for LCT, however, LCT is listed as threatened, wherever found, and thus if States or other agencies stock LCT (like any other sportfish) for recreational purposes, and a Federally authorized or funded project occurs in that location that would result in adverse effects to LCT in that fishery, consultation is required.

Rangewide Status and Recovery

Relevant information on the status of LCT, life history traits, population dynamics, habitat requirements, threats, and distribution can be found in the Recovery Plan for the Lahontan Cutthroat Trout (Service 1995), Updated Goals and Objectives (LCT Coordinating Committee 2019), and the Lahontan Cutthroat Trout Status Reviews (Service 2009, Service 2023). Lahontan cutthroat trout evolved within the geographically isolated Lahontan Basin, which historically contained a large Pleistocene-era lake known as Lake Lahontan. At its largest expanse, Lake Lahontan covered what is now northern Nevada, eastern California, and southern Oregon (Service 1995). About 13,500 years ago, Lake Lahontan began to desiccate, due to a warming environment (Thompson *et al*. 1986, Benson and Thompson 1987), resulting in a smaller network of lakes and sinks within the Lahontan Basin fed by river and/or stream systems. This reduced area is located in what is now known as the Truckee, Carson, Walker, Susan, Humboldt, Quinn, Summit Lake/Black Rock Desert, and Coyote Lake watersheds (Figure 2). The approximate 370,000.0 surface acres of lake habitat and 7,400.0 miles of stream/river habitat is thought to have been occupied or had the potential to have been occupied by LCT circa 1800 (Gerstung 1986, Service 2009, LCT Coordinating Committee 2019).

By the mid-1800s, significant changes occurred across the landscape of the Lahontan Basin due to European settlement of Nevada, California, and Oregon. These changes included over-harvesting of LCT, mining, logging, water pollution, water diversions, dam and reservoir construction, and introduction of nonnative trout species into LCT-occupied habitats (Service 2009, LCT Coordinating Committee 2019). By the early 1900s, noticeable reductions in LCT abundance had occurred; by the mid-1900s, LCT were extirpated from substantial portions of all major drainage basins, and generally restricted to isolated headwater streams or small lake systems (Service 1995, LCT Coordinating Committee 2019). Within the estimated historical range of LCT (circa 1800), approximately 68.0 percent of stream and lake habitat provide occupied and/or potentially suitable habitat for LCT today (LCT Coordinating Committee 2019). The loss of potentially suitable habitat over time is due to climatic and anthropogenic factors discussed further below. Some habitat considered unsuitable for LCT today could potentially be restored and made suitable in the future with management action (LCT Coordinating Committee 2019).

As of 2023, 71 LCT populations that are self-sustaining to some degree exist in approximately 17.0 percent of the remaining potentially suitable habitat (Service 2023). A significant portion of existing populations occur in smaller, isolated habitat fragments, compete with nonnative trout, and/or have degraded habitat conditions. As a result, over half of existing populations are currently unlikely to be resilient or are at risk of extirpation (Service 2023). In addition, recent genetic evidence indicates that hybridization with rainbow trout (*Oncorhynchus mykiss*) is an issue in populations previously thought to be resilient (Service 2023).

The LCT Coordinating Committee (CC) identified and communicated the context and efforts necessary to conserve and ultimately recover LCT in the 2019 Updated Goals and Objectives (LCT Coordinating Committee 2019). The 3 Rs of representation, resiliency, and redundancy formed the framework of what conservation goals and objectives are needed to advance recovery of LCT in the future. These principles are well-accepted by the scientific community because they are rooted in findings from ecological theory and empirical studies (Shaffer and Stein 2000,

Wolf *et al.* 2015), and are aligned with guidance provided by the Service (Service 2016). The range of LCT was divided from 3 Geographic Management Units (GMUs; Service 1995) into 10 LCT Management Units (LMUs), where focus was placed on conserving the adaptive capacity of the species by ensuring its life-history characteristics and genetic diversity are conserved in the variable geographic and ecological settings in which the subspecies evolved (LCT Coordinating Committee 2019). This can be accomplished by ensuring LCT populations are represented (*i.e.*, conserve genetic and behavioral diversity within a variety of ecological and geographic settings), resilient (*i.e.,* contain enough individuals in larger, more diverse habitat fragments), and redundant (*i.e.,* spread the risk of extirpation due to catastrophic events) within each LMU.

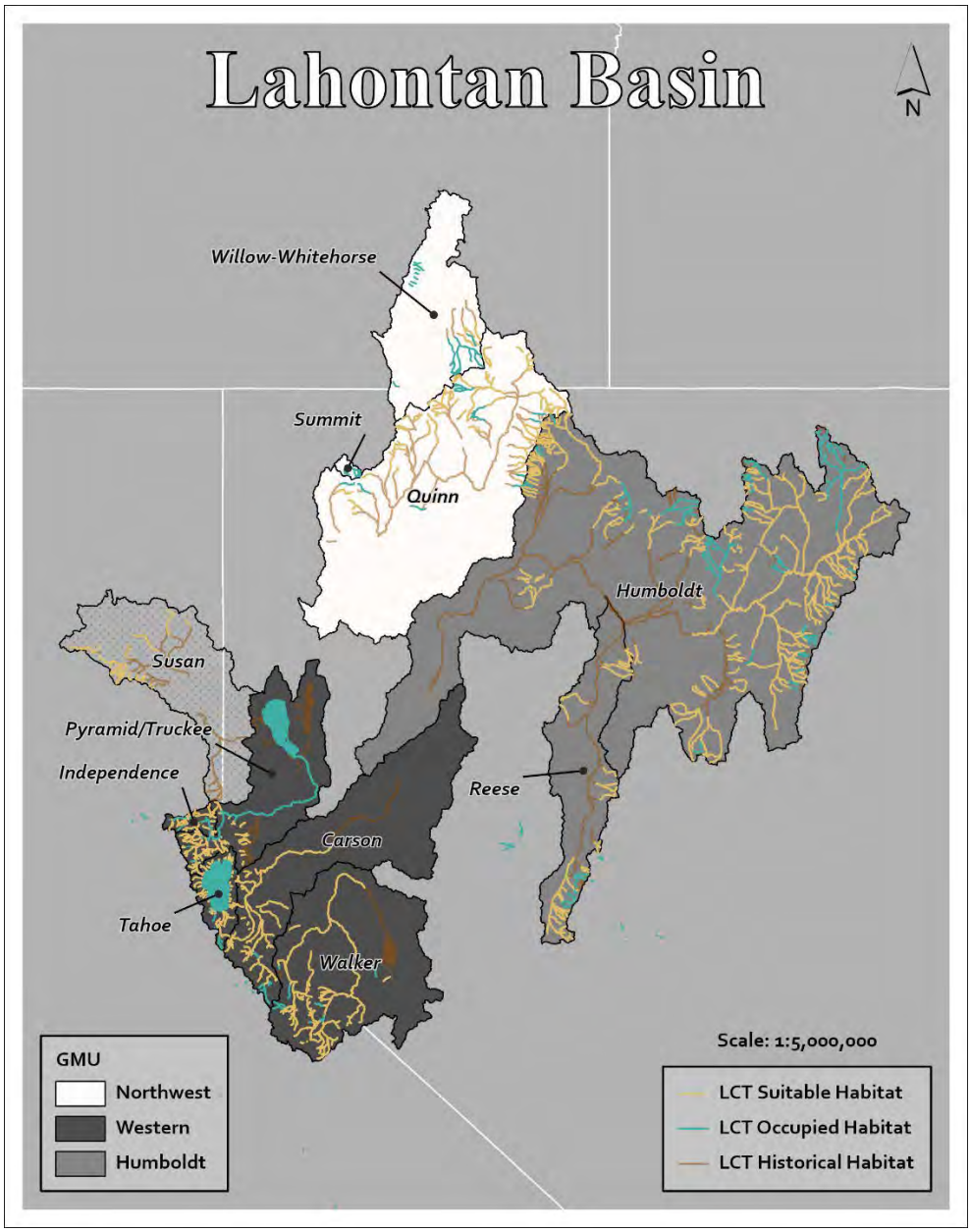

Figure 2. Probable historical (brown streams and waterbodies), potentially suitable (yellow streams and waterbodies) and currently occupied (blue streams and waterbodies) LCT habitat separated into LCT Management Units within the Lahontan Basin (Service 2023).

Threats to Lahontan Cutthroat Trout

The 2009 Service's 5-Year Status Review included a rangewide evaluation of threats to LCT (Service 2009); this evaluation is still applicable to LCT today. The 5-Year Status Review identified nonnative species, habitat fragmentation and isolation, degraded habitat conditions from land use activities, and impacts from climate change as the primary threats affecting the species' long-term persistence. These threats are described below.

Nonnative Salmonids

Nonnative fish, especially salmonid species, are currently the greatest threat to LCT rangewide, resulting in loss of available habitat and range constrictions primarily through competition and hybridization. Nonnative salmonids including brook trout (*Salvelinus fontinalis*), brown trout (*Salmo trutta*), and rainbow trout pose significant threats to the resiliency of many LCT populations (at least 35.0 percent) across its range (Service 2009, Service 2023).

Brook trout in particular have been shown to out compete native cutthroat trout, including LCT (Service 2023). When brook trout invade streams occupied by cutthroat trout, the native cutthroat trout decline or are displaced due to higher densities, biomass, and production exhibited by brook trout (Griffith 1988, Behnke 1992, Young 1995, Benjamin and Baxter 2012). Competition with brook trout reduces recruitment of cutthroat trout and reduces inter-annual survival of juveniles, leading to a reduction of population size of the native cutthroat trout population (Peterson *et al*. 2004, McGrath and Lewis 2007). When LCT occur in the same stream as brook trout, LCT typically occupy the colder, headwater reaches and the nonnative trout occupy areas downstream (Dunham *et al*. 1999, Dunham *et al*. 2002).

Brown trout have also been shown to displace native cutthroat trout populations through competitive advantages (Wang and White 1994, De la Hoz Franco and Budy 2005, McHugh and Budy 2005, McHugh and Budy 2006, Budy *et al.* 2008, Shemai *et al.* 2007, McHugh *et al*. 2008). Brown trout occupy the best habitat, have higher growth rates, are associated with reduced survival of cutthroat trout, and have a distinct allopatric (in different geographic areas) distribution within a watershed when they co-occur with native cutthroat trout (Wang and White 1994, De La Hoz Franco and Budy 2005, McHugh and Budy 2005, McHugh and Budy 2006, Shemai *et al.* 2007, Budy *et al*. 2008).

Hybridization from nonnative salmonids is a common threat to all native western trout species, including LCT (Gresswell 1988, Behnke 1992, Young 1995, Service 2009). Nonnative rainbow trout readily hybridize with native cutthroat trout and produce fertile offspring; however, fitness and survival rates decrease over time as the proportion of rainbow trout admixture increases (Muhlfeld *et al*. 2009, Rasmussen *et al*. 2010). Even with reduced fitness over time, hybridization spreads rapidly because the initial F_1 hybrids have relatively high fitness, hybrids tend to stray more frequently, and all offspring of hybrids are hybrids (Boyer *et al*. 2008, Muhlfeld *et al*. 2009). Extensive genetic mixing of natives, nonnatives, and hybrids contributes to the loss of locally adapted genotypes and can lead to the extinction of a population or an entire species (Leary *et al*. 1995, Rhymer and Simberloff 1996). Isolating populations of native salmonids from nonnative salmonids has become a frequently used management option;

however, barriers can restrict life history traits, isolate populations in small habitats which reduces long-term survival, and do not allow for recolonization if the population is extirpated (Fausch *et al*. 2009).

Habitat Fragmentation and Population Isolation

Habitat fragmentation is one of the leading causes of cutthroat trout population declines in the western United States (Dunham *et al*. 1997). Habitat fragmentation reduces the total habitat available, reduces habitat complexity, and prevents gene flow (Dunham *et al*. 1997). Fragmentation accelerates extinction, especially when movement of fish among stream segments is not possible (Fagan 2002). Isolated populations are more vulnerable to extinction through demographic stochasticity, environmental stochasticity, loss of genetic heterozygosity, and human disturbance (Lande 2002).

A significant portion of LCT populations (about 72.0 percent) are completely isolated in small stream reaches lacking adequate habitat size and complexity (Service 2009, Service 2023). Evidence of loss of genetic diversity has been found in small, isolated LCT populations (Neville *et al*. 2006, Peacock and Kirchoff 2007). Several studies found that population viability of cutthroat trout is correlated with stream length or habitat size (Hilderbrand and Kershner 2000, Harig and Fausch 2002). A shorter stream reach could mean that one or more of LCT's required habitats is either missing or inadequate for completion of the species' life cycle.

Habitat Degradation

Livestock Grazing

Some level of livestock grazing is associated with the majority (about 90.0 percent) of LCT populations (Service 2009, Service 2023). Livestock grazing can affect riparian areas by changing, reducing, or eliminating vegetation (Schulz and Leininger 1990, Green and Kauffman 1995), and by the actual loss of riparian areas through channel widening (Overton *et al.* 1994), channel degradation, or lowering of the water table (Chaney *et al.* 1990). Effects to fish habitat include reduction of shade and cover and resultant increases in water temperature, changes in stream morphology, and the addition of sediment due to bank degradation and off-site soil erosion (Platts 1991, Belsky *et al*. 1999).

Water Management

Water management can negatively impact LCT through reduced water quality and quantity, fish entrainment into irrigation systems, fish barriers, and the loss of habitat diversity (Service 2009). Water management is a threat to LCT throughout its range (Service 2023) and impacts from water management activities to LCT occur conspicuously in the Truckee, Walker River, Reese River, and Humboldt River watersheds. Natural low flows caused by droughts have occurred historically but are now exacerbated by flow diversions. Where water diversions lead to lower instream flows, LCT are affected by increased water temperature, limited access to aquatic habitats, and increased opportunity for competition between fish species (Spence *et al.* 1996, Harvey *et al.* 2006). Dewatering of stream channels for irrigation may result in stranding of fish, exposure and desiccation of spawning redds and nursery habitat, and disruption of LCT

migratory patterns (Spence *et al.* 1996).

Many diversion structures fragment watersheds and act as barriers to fish migration, limiting the ability of migrating adults, juveniles and fry to migrate to required life history habitats (Fausch *et al.* 2002, Ovidio and Philippart 2002, Compton *et al.* 2008). Certain barriers are complete obstructions to upstream immigration, while others may be partial barriers. When access is limited, fish may spawn in and utilize sub-optimal habitat. Out-migrating fry and juveniles may be injured or killed during downstream migration through entrainment into irrigation canals or passage over obstructions (Carlson and Rahel 2007, Roberts and Rahel 2008, Simpson and Ostrand 2012, Walters *et al*. 2012, Walters *et al*. 2013).

Mining

While mining is thought to be a low-magnitude threat to LCT on a rangewide basis, areas of concentrated impact do exist across the species' range, such as in the North Fork Humboldt River drainage (Service 2023). The effects of mining on receiving water systems can represent a severe threat to all aquatic organisms in localized situations (Nelson *et al*. 1991). Mining can contribute toxic substances into waterways, alter stream morphology, and dewater streams completely (Nelson *et al*. 1991, Service 2008). Mining can also have dramatic impacts to groundwater dependent ecosystems. Mining activities through exploratory drilling, open pit and underground mining, or dewatering alter the hydrologic pathways near the mine site, which can cause a multitude of impacts such as declining aquifers, drying of springs, and reducing streamflow in nearby streams (Younger and Wolkersdorfer 2004).

Climate Change

Effects of climate change include, but are not limited to, changes in types and amounts of precipitation (Knowles *et al*. 2006; Seager *et al*. 2007), reduced snowpack (Mote *et al*. 2005; Pierce *et al*. 2008), earlier spring run-off (Stewart *et al*. 2005; Hidalgo *et al*. 2009), longer and more intense fire seasons (Brown *et al*. 2004; Westerling *et al*. 2006; Bachelet *et al*. 2007), and more frequent extreme weather events (Diffenbaugh *et al*. 2005; Rosenzweig *et al*. 2007; Kunkel *et al*. 2009). Climate change is predicted to have several effects on cold water habitat including: (1) Increased water temperature; (2) decreased stream flow; (3) change in the hydrograph; (4) increased frequency and severity of extreme events such as drought and floods; and (5) changing biotic interactions between native and nonnative species (Stewart *et al*. 2005; Ficke *et al*. 2007; Bates *et al*. 2008; Webb *et al*. 2008; Williams *et al*. 2009; Haak *et al*. 2010; Kaushal *et al*. 2010; Point Reyes Bird Observatory (PRBO) Conservation Science 2011; Wehner *et al*. 2011; Wenger *et al*. 2011; Leppi *et al*. 2012; Arismendi *et al*. 2013; Roberts *et al*. 2017).
Climate change is expected to have multiple negative impacts to cold water salmonids, including but not limited to rising water temperatures. Haak *et al.* (2010) analyzed the potential cumulative impacts of four climate risk factors (increased stream temperatures, winter flooding, wildfire, and drought) on the persistence of 10 native salmonids in the western United States, including LCT. The primary climate risk factors for LCT are drought and increased stream temperatures (Haak *et al.* 2010).

Drought

Drought-related effects can impact many different scales of organizational complexity, including effects to individuals, local populations, local fish assemblages, metapopulations, watershed or regional faunas, ecosystems, and evolutionary impacts (Labbe and Fausch 2000, Lake 2003, Matthews and Marsh-Matthews 2003). In a review of 50 different studies on drought-related impacts to fish, Matthews and Marsh-Matthews (2003) reported the most common impacts were decreases in numbers at the population and community level, loss of habitat, poor water quality (*i.e.,* hypoxia and temperature), decreased ability for movement, crowding, and desiccation. Drought related decreases in several LCT populations have been documented (Dunham 1996, Ray *et al*. 2007, Neville *et al*. 2016).

Small streams are more susceptible than larger streams to drying, increased stream temperatures during the summer, and freezing during the winter (Lake 2003). Given that many LCT populations exist in small, headwater streams, populations are at disproportional risk to these effects. Although not all small streams have equal risk from drought (*i.e.*, spring-dominated flow has less risk than snowmelt-dominated flow), small headwater streams, especially those with an inadequate number of deep pools, are most likely to lose suitable habitat (Lake 2003). However, functioning small streams with good quality habitat (*e.g.*, deep pools, healthy riparian vegetation) and limited anthropogenic influences can sustain salmonids during drought conditions (Magoulick and Kobza 2003, White and Rahel 2008).

Wildfire

Although LCT evolved in a fire-prone environment, increases in wildfire frequency and severity due to increased fuel loads and effects from climate change (Westerling *et al.* 2006, Miller *et al*. 2019) increases the threat to LCT. Wildfires are also a threat to LCT because of existing habitat loss and the fragmented and isolated state of occupied habitat.

Direct mortality of fish has been observed, mainly in smaller streams due to greater impacts from fire on smaller aquatic habitats (Rinne and Jacoby 2005, Howell 2006). Most negative effects to aquatic species after wildfire are due to the immediate loss or alteration of habitat. Riparian vegetation is directly consumed by fire, which may cause an increase in water temperature and the loss of cover for aquatic species (Dunham *et al.* 2007). Increases in stream temperature are a common occurrence after a wildfire due to loss of riparian vegetation and increased solar radiation (Gresswell 1999, Moore *et al.* 2005, Dunham *et al.* 2007, Isaak *et al.* 2010, Mahlum *et al.* 2011). Post-fire hydrologic events can severely reduce or extirpate local fish populations (Gresswell 1999, Burton 2005, Sestrich *et al.* 2011). Isolated fish populations are at a much higher risk of extinction because they cannot recolonize after a large disturbance (Rinne 1996, Burton 2005, Dunham *et al.* 2007). Additionally, effects on small streams are more severe because larger proportions of the drainage are burned at these smaller spatial scales, in contrast to larger stream orders, where relatively small proportions of the drainage burn (Romme *et al.* 2011, Sestrich *et al.* 2011).

ENVIRONMENTAL BASELINE

The implementing regulations for section 7(a)(2) (50 CFR 402.02) define the environmental

baseline as "the condition of the listed species or its designated critical habitat in the action area, without the consequences to the listed species or designated critical habitat caused by the proposed action. The environmental baseline includes the past and present impacts of all Federal, State, or private actions and other human activities in the action area, the anticipated impacts of all proposed Federal projects in the action area that have already undergone formal or early section 7 consultation, and the impact of State or private actions which are contemporaneous with the consultation in process. The consequences to listed species or designated critical habitat from ongoing agency activities or existing agency facilities that are not within the agency's discretion to modify are part of the environmental baseline."

Status of the Species in the Action Area

Lahontan cutthroat trout historically were the only native trout in the Lake Tahoe watershed, and subsequently the Tahoe LCT Management Unit; prior to western settlement, they likely occupied most of the available stream and lake habitats that were accessible through Lake Tahoe. Although Marlette Lake did not exist at that time (see next section), it is likely that LCT used Marlette Creek, at least to some degree. Currently, LCT occupy several different locations for various purposes within the Tahoe LCT Management Unit, including a resilient, recovery population within the Upper Truckee River system that is currently being expanded downstream towards Lake Tahoe, stocked recreational and research populations within Fallen Leaf Lake and Lake Tahoe, and the recreational population found within Marlette Lake.

Habitat Characteristics and Existing Condition of the Action Area

Marlette Lake is an artificial reservoir first created *via* the construction of a dam in the late 1800s that was further fortified and raised in 1959 (NDOW 2023). Today, it provides alpine lake habitat, suitable for a productive cold-water fishery. Due to the stocking of LCT and rainbow trout annually by NDOW, the lake supports a popular recreational sport-fishery. Water from Marlette Lake is also used for domestic purposes and for drinking water. Mostly, this area experiences backcountry-only use, with heavier use occurring in the summer months, including consumptive angling of LCT.

Condition (Status) of the Species in the Action Area

As previously mentioned, LCT are present within Marlette Lake for recreational, and not recovery, purposes. Each spring, NDOW operates a spawning station on a small tributary that enters the lake along its southern edge; rainbow trout and LCT are captured, spawned, and released. Milt and eggs are combined to produce pure rainbow trout, cuttbows (by crossing a pure LCT with a pure rainbow trout), and pure LCT. These fertilized eggs are incubated and hatched within NDOW facilities; fish are held on station for various lengths of time and are stocked through Nevada for recreational purposes. Because LCT cannot naturally reproduce in the tributaries associated with Marlette Lake, NDOW annually stocks them to maintain the recreational fishery and continue to develop brood for spawning activities; thus, only adult LCT exist in the lake.

It was conservatively estimated, by totaling NDOW's annual stocking numbers for the last 5

years, that up 21,000 LCT could be present in Marlette Lake in October 2024 when the proposed action would begin (FEMA 2023). Five years was chosen as it was assumed that the average lifespan of LCT in Marlette Lake is 5 years based on expert opinion (FEMA 2023). However, simply totaling the number of stocked LCT year over year for its expected lifespan in that habitat does not provide an accurate estimate of the population's size. That is because LCT are subject to mortality after each stocking event due to their inability to adapt to a new environment (with variable mortality rates, but relatively high normally), competition with and likely predation by resident non-native rainbow trout and LCT, and consumptive angling throughout the summer months by the public. Thus, there will likely be many fewer LCT than the estimated 21,000 individuals when the proposed action would begin. However, because demographic surveys are not completed for this lake as it is mostly used as a production lake, this is the best way available to estimate the current population size.

Recovery

Marlette Lake is not identified as a priority population for the conservation and recovery of LCT in either the 1995 Recovery Plan for LCT (Service 1995) or the 2019 Updated Goals and Objectives for the Conservation of LCT, which reflect the recovery team's current recovery goals and objectives (LCT Coordinating Committee 2019).

EFFECTS OF THE ACTION

The implementing regulations for section 7(a)(2) (50 CFR § 402.02) define effects of the action as "all consequences to listed species or critical habitat that are caused by the proposed action, including the consequences of other activities that are caused by the proposed action. A consequence is caused by the proposed action if it would not occur but for the proposed action and it is reasonably certain to occur. Effects of the action may occur later in time and may include consequences occurring outside the immediate area involved in the action" (50 CFR 402.17).

The regulations for section 7(a)(2) note that "a conclusion of reasonably certain to occur must be based on clear and substantial information, using the best scientific and commercial data available" [50 CFR § 402.17(a)]. When considering whether activities caused by the proposed action (but not part of the proposed action) or activities reviewed under cumulative effects are reasonably certain to occur, we consider factors such as (1) past experiences with activities that have resulted from actions that are similar in scope, nature, and magnitude to the proposed action; (2) existing plans for the activity; and (3) any remaining economic, administrative, and legal requirements necessary for the activity to go forward.

In conducting this analysis, we have considered factors described and referenced above in the Status of the Species section of this document and within the Biological Assessment associated with this proposed action (FEMA 2023) in determining whether effects are reasonably certain to occur. Because natural spawning cannot occur in Marlette Lake and NDOW manages this population for fish production mostly, only adult LCT will be present at the time of the proposed action; thus, effects to eggs, fry, or young-of-year were not considered in this consultation. We have also determined that certain consequences are not caused by the proposed action, such as the increase or spread of disease, poaching, or collecting, because they are so remote in time, or

geographically remote, or separated by a lengthy causal chain, so as to make those consequences not reasonably certain to occur.

Effects of the Proposed Action on Lahontan Cutthroat Trout

Construction

The actual retrograding of Marlette Lake Dam will have little effect on LCT within Marlette Lake. All the construction activities (*e.g.*, removing rip-rap and regrading/replacing embankments of the dam, removing and replacing the concrete spillway associated with the dam, adding/upgrading intake/outlet structures and piping) will occur in a dry forebay work area disassociated from the lake. Due to the numerous best management practices in place (see Section 2.4: Best Management Practices, FEMA 2023, for more information), it is also unlikely that these construction activities would influence water quality in Marlette Lake during re-watering of the forebay work area either. Moreover, most of the work on the dam is replacement of aged infrastructure (except for the addition of a toe drain and the enlargement of the downstream embankment), so upon re-watering, it would be very similar to the existing condition for LCT. The enlargement of the downstream embankment will not change existing conditions for LCT because LCT do not have access to the downstream portion of the dam.

However, the dewatering of the proposed action area will undoubtedly adversely affect LCT in Marlette Lake.

Dewatering/Rewatering

The dewatering of Marlette Lake will result in significant adverse effects to LCT. The available lake habitat will be reduced by at least 52 percent over the course of six months (October 2024–March 2025), and dewatering will occur during the winter when reducing the lake volume increases the likelihood that more of the lake's water will freeze. These factors will increase competition for resources and decrease available food and habitat, which is likely to result in mortality of at least a portion of the existing LCT population.

The NDOW will capture and relocate as many LCT as they reasonably can to waters unaffected by the proposed action prior to both dewatering activities. It is unclear how many individuals will be captured and relocated during these efforts, or how many might die during or because of these activities. It is clear, however, that these proposed capture and relocation activities are also likely to result in mortality of at least several LCT individuals.

It is unlikely that rewatering activities will have significant impacts on LCT remaining in the lake after construction is completed due to the various best management practices in place to reduce turbidity and the rate of change (see Section 2.4: Best Management Practices, FEMA 2023, for more information). For example, it is proposed to slowly rewater the forebay work area to reduce effects from increased sediment in the water column and to keep sediment barriers in place until all disturbance associated with construction is completed. In fact, the LCT that remain in the lake after construction is completed are likely to benefit from increased habitat availability due to the reduction in overall LCT numbers, and through time, increased food availability and

decreased competition while the lake rewaters naturally and more food and habitat become available; this will likely continue to occur for the 6 years following the completion of the proposed action, or at least until NDOW resumes trout stocking activities.

Operations/Maintenance

Marlette Lake Dam has existed in its current form since 1957. Operations and maintenance activities have not been examined previously and were not included in the biological assessment for the proposed action. However, future maintenance activities will likely be largely reduced by the proposed action. In addition, several of the components being replaced or installed (*e.g.*, intake piping, toe drain) are more modern and contain improved safety features, likely further reducing impacts to fish in the lake. Therefore, it is unlikely that impacts to LCT of operations or maintenance of Marlette Lake Dam will be increased beyond previous levels upon completion of the proposed action.

Effects on Recovery

The effects of the proposed project are not expected to reduce recovery potential for LCT. The Marlette Lake population of LCT is not prioritized for recovery or conservation of the species in either the 1995 Recovery Plan or the 2019 Updated Goals and Objectives for LCT. Furthermore, this population is maintained solely for recreation and as a broodstock, and due to this was not examined in the most recent Status Review, which focused on evaluating LCT populations which are prioritized for the recovery of the species. Recovery actions in this basin are currently ongoing elsewhere, and the inclusion of the Marlette Lake recreational population is not considered essential to achieving recovery.

Summary of Effects

This project will significantly and adversely affect LCT within Marlette Lake. It is likely that at least 52 percent of the habitat within Marlette Lake will be lost through the dewatering of the lake to allow for dam retrograde activities. This will kill a significant number of the LCT from this population through the loss of habitat, which will increase competition and predation, and decrease food availability. The effects to individuals have been minimized as much as possible through the inclusion of extensive best management practices, but to retrograde the existing dam, over half of the lake's water must be removed. However, it is possible that NDOW can capture and relocate many LCT prior to or during dewatering activities though, reducing the loss caused by the proposed action. In the end, the loss of LCT in this system does not affect the recovery of this species, as this population is managed for recreational and broodstock purposes only.

CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. We do not consider future Federal actions that are unrelated to the proposed action in this section because they require separate consultation pursuant to section 7 of the Act. As previously mentioned, NDOW manages this LCT population as a recreational sport-fishery and stocks LCT and rainbow trout annually within it to maintain the resource. Additionally, NDOW staff operate a

spawning station in the summer and brood in this lake as used to create offspring that are stocked in other water bodies throughout Nevada. It is likely that these activities will continue upon the rewatering of Marlette Lake. It is also likely that the public continues to consumptively fish for LCT and rainbow trout in this lake upon the reestablishment of the sport-fishery. Other than what was occurring before this proposed action, there are no other known cumulative effects to be considered.

CONCLUSION

The regulatory definition of "to jeopardize the continued existence of the species" focuses on assessing the effects of the proposed action on the reproduction, numbers, and distribution, and their effect on the survival and recovery of the species being considered in the biological opinion. For that reason, we have used those aspects of LCT status as the basis to assess the overall effect of the proposed action on the species.

The proposed project will undoubtedly significantly reduce the numbers of LCT in Marlette Lake as the lake's available habitat and food resources are reduced during and after dewatering. It is likely that the reduction in numbers of LCT will mirror the loss of habitat (by over at least 52 percent) of the conservatively estimated population of 21,000. It won't affect the reproduction of LCT in this system because they do not naturally reproduce. LCT, at least in small numbers, may survive the dewatering event, but their distribution in the lake will be greatly reduced (to at least less than 47 percent of the current lake habitat). Regardless of whether most or all the LCT die due to the proposed action, it will not affect the recovery of the species, as NDOW manages this population, and it only exists because of their annual spawning and stocking activities. Lastly, NDOW is reasonably certain to reestablish this recreation sport-fishery upon the rewatering of Marlette Lake.

After reviewing the current status of LCT, the environmental baseline for the action area, the effects of the proposed Marlette Lake Dam Resilient Infrastructure Project and the cumulative effects, it is the Service's biological opinion that the Marlette Lake Dam Resilient Infrastructure Project, as proposed, is not likely to jeopardize the continued existence of LCT.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened wildlife species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm in the definition of "take" in the Act means an act which actually kills or injures wildlife. Such [an] act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering (50 CFR 17.3). Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not the purpose of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this incidental take statement.

AMOUNT OR EXTENT OF TAKE

The Service anticipates that the proposed project considered in this biological opinion is reasonably certain to result in direct take of adult LCT during capture and relocation activities or during/after dewatering. The Service is reasonably certain that the incidental take described here will occur because: (1) LCT are known to occur in Marlette Lake and have no access to other waterways into which they could move; and (2) the proposed project will impact habitat that could impair feeding or sheltering for LCT.

We cannot quantify the precise number of LCT that may be taken as a result of the proposed action because it is unclear how many LCT may be captured *via* electrofishing and subsequently relocated, or how the dewatering of the lake by 52 percent of its normal volume will ultimately affect the food/habitat availability in the lake, and the resulting effect that will have on any remaining LCT. For example, the lake may freeze solid because of its reduced volume, and then all the fish present in the remaining amount of water may die. In contrast, the winter may be mild, and the lake may warm up sooner in the spring/summer than normal because of its reduced volume, increasing algal/plant production and ultimately habitat complexity and food availability. In addition, finding a dead or injured LCT will be challenging as scavengers will likely eat carcasses quickly if on the surface or shore, or individuals may sink to the bottom of the lake eluding detection. Accessing the lake following dewatering to confirm mortality numbers may also be impossible due to conditions of the dewatered lake shore.

We also recognize that for every LCT found dead or injured, other individuals may be killed or injured that are not detected, so when we determine an appropriate take level we are anticipating that the actual take would be higher and we set the number below that level. Similarly, for estimating the number of LCT that would be taken by capture, we cannot predict how many may be encountered for reasons stated earlier. Also, because capture can be highly variable, depending upon the species and the timing of the activity, we do not anticipate a number so low that reinitiation would be triggered before the effects of the activity were greater than what we determined in the Effects Analysis. Consequently, we are unable to reasonably anticipate the actual number of LCT that would be taken by the proposed action; however, we must provide a level at which formal consultation would have to be reinitiated.

Based on the best available scientific and commercial information, it is estimated that there are, at most, 21,000 LCT in Marlette Lake. Given the analysis above and in the Environmental Baseline and Effects Analysis sections of this biological opinion, it is reasonable to estimate that adverse effects to LCT will likely be high given the nature of the proposed activities, and in fact may result in total loss of the population. As this population is not a priority for recovery and conservation of the species, it seems reasonable to allow this amount of incidental take. If more than 21,000 LCT are found dead or wounded or are captured, FEMA must contact our office immediately to reinitiate formal consultation. Moreover, this fishery is reasonably certain to be reestablished upon lake rewatering, resulting in the replacement of the LCT lost because of this project. Project activities that are likely to cause additional take should cease as the exemption provided pursuant to section 7(o)(2) may lapse and any further take could be a violation of section 4(d) or 9.

REASONABLE AND PRUDENT MEASURES

The measures described below are non-discretionary and must be undertaken by FEMA or made binding conditions of any grant or permit issued to the Nevada Division of Emergency Management (NDEM), as appropriate, for the exemption in section 7(o)(2) to apply. FEMA has a continuing duty to regulate the activity covered by this incidental take statement. If FEMA (1) fails to assume and implement the terms and conditions or (2) fails to require the NDEM to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, the protective coverage of section 7(o)(2) may lapse. To monitor the impact of incidental take, FEMA must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement [50 CFR 402.14(i)(3)].

The Service believes the following reasonable and prudent measures are necessary and appropriate to minimize impacts of incidental take of LCT:

1) Minimize effects of electrofishing to LCT captured for relocation.

2) Monitor incidental take resulting from the proposed project and report the findings of that monitoring to the RFWO.

TERMS AND CONDITIONS

To be exempt from the prohibitions of section 9 of the Act, FEMA must comply with the following terms and conditions, which implement the reasonable and prudent measures described above and outline reporting and monitoring requirements. These terms and conditions are non-discretionary.

1. Electrofishing guidelines (Enclosure) shall be followed during the LCT capture and relocation portion of the proposed action. The guidelines require that field crews be trained in observing animals for signs of stress and shown how to adjust electrofishing equipment to minimize that stress. All electrofishing equipment operators shall be trained by qualified personnel to be familiar with equipment, handling, settings, maintenance, and safety. Only direct current (DC) electrofishing equipment shall be used, and the equipment shall be regularly maintained to ensure proper operating condition. Voltage, pulse width, and rate shall be kept at minimum levels, and water conductivity shall be tested before electrofishing starts so the minimum levels can be determined. Due to the low settings used, shocked fish normally revive instantaneously. Fish requiring revivification shall receive immediate, adequate care.

2. FEMA shall provide the Service with annual reports of project implementation including photo documentation of all aspects of the project. The annual report should briefly summarize the previous year's activities, including: (1) Implementation and effectiveness of the terms and conditions, (2) documentation of take of LCT associated with the capture and relocation portion of this project, to include numbers captured and released, their disposition, and any mortality, and (3) documentation of take of LCT associated with the dewatering portion of the proposed project, to include to the best knowledge, the number of LCT found injured or deceased. Additional information may be included as necessary or requested by the

Service. The first annual report shall be due to the Service on or before December 31 of the first year of project implementation and every year thereafter for the duration of the proposed project. The address for the Reno Fish and Wildlife Office is:

Field Supervisor
U.S. Fish and Wildlife Service
1340 Financial Boulevard, Suite 234
Reno, Nevada 89502
Telephone: (775) 861-6300

REPORTING REQUIREMENTS

Pursuant to 50 CFR 402.14(i)(3), FEMA must report the progress of the action and its impact on the species to the Service as specified in this incidental take statement. Given the context of the Project and proposed action, LCT take is expected as a result of project activities. Care must be taken in handling sick or injured LCT to ensure effective treatment and care and in handling dead specimens to preserve biological material in the best possible state. In conjunction with the care of sick and injured fish or wildlife and the preservation of biological materials from a dead specimen, FEMA has the responsibility to ensure that information relative to the date, time, and location of the fish, when found, and possible cause of injury or death of each is recorded and provided to the Service via the annual reporting requirements defined in Reasonable and Prudent Measure Number 2 of this BO.

REINITIATION NOTICE

This concludes formal consultation on the actions outlined in FEMA's request for consultation letter for the Marlette Lake Dam Resilient Infrastructure Project. As provided in 50 CFR 402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, the exemption issued pursuant to section 7(o)(2) may have lapsed and any further take could be a violation of section 4(d) or 9. Consequently, we recommend that any operations causing such take cease pending reinitiation.

If you have any questions about this biological opinion, please contact Sean Vogt of my staff at 775-861-6330, or by electronic mail at sean_vogt@fws.gov.

Sincerely,

Jodie Mamuscia
Acting Field Supervisor

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Appendix B

Floodplain Management and Wetland Protection Eight-Step

Executive Order 11988 Floodplain Management Checklist (44 CFR Part 9)

Project Information

Date: 12/15/23

Reviewer: Abbie Woodruff

Disaster/Program: PDM

Project Number: PDMC-PJ-09-NV-2018-001

Project Title: Marlette Lake Dam Resilient Infrastructure Project

Latitude: 39.172864

Longitude: -119.907403

Description of Proposed Action:

The Nevada State Public Works Division (SPWD) (Subapplicant) is proposing to stabilize Marlette Lake Dam to reduce hazards from seismic events by enlarging the downstream embankment with fill, replacing the existing corroded and leaking outlet works, and raising the crest of the dam to address freeboard deficiencies. SPWD is also proposing to replace the aging spillway, which is currently undersized and open to snow

Applicability

Actions which have the potential to affect floodplains or their occupants, or which are subject to potential harm by location in floodplains.

Will the proposed action potentially adversely affect the floodplain or support floodplain development?

Yes ☒ No ☐

Will the proposed action potentially be adversely affected by the floodplain?

Yes ☒ No ☐

Critical Action

Determine whether the proposed action is an action for which even a slight chance of flooding is too great. Critical actions must be reviewed against the 500-year floodplain.

Is the action a critical action?

☐ Yes, review against the 500-year floodplain

☒ No, review against the 100-year floodplain.

☐ Not Applicable, the action is located in wetlands only

Step 1: Determine Proposed Action Location

Determine whether the proposed action is located in the 100-year floodplain (500-year floodplain for critical actions); and whether it has the potential to affect or be affected by a floodplain or wetland (44 CFR Section 9.7).

Floodplain Determination

Flood Hazard Data (Check the box that applies)

Is the project located in a 100 year floodplain as mapped by a FEMA FIRM?

Yes ☒ No ☐

FIRM Panel Number: 32031C3425G, 3200010075E, 3200010200E, and

Date: 3/16/2009, 1/16/2009, 1/20/

Is the project located in a 500 year floodplain as mapped by a FEMA FIRM?

Yes ☐ No ☒

FIRM Panel Number:

Date:

Is the project located in a floodplain as mapped by a FEMA draft/preliminary study?

Yes ☐ No ☒

Study Name:

Date:

Is the project located in a floodplain as mapped by another agency (State, USACE, USGS, NRCS, local community, etc)?

Yes ☐ No ☒

Study Name:

Date:

Is the project outside the floodplain but has potential to affect the floodplain, including support of floodplain development?

Yes ☐ No ☒

Flood Hazard Data Not Available

Is the proposed action subject to flooding based on an evaluation from soil surveys, aerial photos, site visits, and other available data?

Yes ☒ No ☐

Evaluation material: The access routes, turnouts, and staging areas are in Z

Does FEMA assume the Proposed Action is subject to flooding based on previous flooding of the facility/structure?

Yes ☐ No ☒

Floodway/Coastal High Hazard Area

Is the project located in a floodway or coastal high hazard area (full 8 step process is required)?

Yes ☐ No ☒

Source, other than FIRM:

Wetland Determination

Is the project in a wetland as mapped by the National Wetlands Inventory?

Yes ☒ No ☐

Wetland Classification: Freshwater Forested/Shrub Wetland, Freshwater Em

Date: 12/15/23

Is the project in a wetland as mapped by another agency (USACE, state, local community)?

Yes ☐ No ☒

Name of study:

Date:

Scope

Select the appropriate block for the steps required.

☐ Steps 1, 4, 5, and 8 (44 CFR Part 9.5(g))

☐ Steps 1, 2, 4, 5, and 8. (44 CFR Part 9.5(d))

☒ All 8 steps

Step 2: Early Public Notice

Notify the public at the earliest possible time of the intent to carry out an action in a floodplain and involve the affected and interested public in the decision-making process (44 CFR Section 9.8).

Was notice provided as part of a disaster cumulative notice?

Yes ☐ No ☒ Not Applicable ☐

Was a project specific notice provided?

Yes ☒ No ☐ Not Applicable ☐

If yes, select the type of notice:

☒ Newspaper, name: Reno Gazette-Journal

☐ Post Site, location:

☐ Broadcast, station:

☐ Direct Mailing, area:

☐ Public Meeting, dates:

☒ Other: https://publicworks.nv.gov/uploadedFiles

Date of Public Notice: August 24, 2022

Step 3: Analysis of Practicable Alternatives

Identify and evaluate practicable alternatives to locating the proposed action in a floodplain (including alternate sites, actions, and the "no action" option). If a practicable alternative exists outside the floodplain, FEMA must located the proposed action at the alternative site (44 CFR Section 9.9).

Alternative Options

Is there a practicable alternative site location outside the 100-year floodplain (or 500-year floodplain for critical actions?)

Yes ☐ No ☒ Not Applicable ☐

If yes, describe the alternative site:

Other alternatives were considered to address the seismic hazards associated with Marlette Lake Dam. The proposed action is the only practicable alternative despite exposure to flood risk and disruption of natural values. Minimization of harm to or within the floodplain and wetlands can be

Is there an alternative action which has less potential to affect or be affected by the floodplain?

Yes ☐ No ☒ Not Applicable ☐

If yes, describe the alternative action:

Is the "no action" alternative the most practicable alternative?

Yes ☐ No ☒ Not Applicable ☐

If any answer is yes, that FEMA shall take that action and the review is concluded.

Floodway

Is the action new construction (i.e. construction of new structure, demolition/ rebuilding, reconstruction, replacement) or substantial improvement (for structures damaged in equal or excess of 50% of its market value or the total replacement cost of the structure)?

Yes ☐ No ☐ Not Applicable ☒

If Yes, is the action a functional dependent use (cannot perform its intended purpose unless it is located or carried out in close proximity to water) or a facility or structure that facilitates open space use?

Yes ☐ No ☐ Not Applicable ☒

If yes, explain:

If no, FEMA cannot fund this action

Is the action an alteration of a structure or facility listed on the National Register of Historic Places or a State Inventory of Historic Places?

Yes ☐ No ☐ Not Applicable ☒

If yes, then this is not substantial improvement and the action may proceed as long as it does not cause any increase of flood levels within the community during the occurrence of the base flood discharge.

Coastal High Hazard Zone

Is the action new construction (i.e. construction of new facility or structure, demolition/ rebuilding of facilities or structures, reconstruction of facilities or structures, replacement of facilities or structures)?

Yes ☐ No ☐ Not Applicable ☒

If Yes, is the action a functional dependent use (cannot perform its intended purpose unless it is located or carried out in close proximity to water) or a facility or structure that facilitates open space use?

Yes ☐ No ☐ Not Applicable ☒

If yes, explain:

If no, FEMA cannot fund this action.

Step 4: Identify Impacts

Identify the potential direct and indirect impacts associated with the occupancy or modification of the floodplains and the potential direct and indirect support of floodplain development that could result from the proposed action (44 CFR Section 9.10).

Is the proposed action based on incomplete information?

Yes ☐ No ☒ Not Applicable ☐

Is the proposed action in compliance with the NFIP?

Yes ☒ No ☐ Not Applicable ☐

Does the proposed action increase the risk of flood loss?

Yes ☐ No ☒ Not Applicable ☐

Will the proposed action result in an increased base discharge or increase the flood hazard potential to other properties or structures?

Yes ☐ No ☒ Not Applicable ☐

Does the proposed action minimize the impact of floods on human health, safety, or welfare?

Yes ☒ No ☐ Not Applicable ☐

Will the proposed action induce future growth and development, which will potentially adversely affect the floodplain?

Yes ☐ No ☒ Not Applicable ☐

Does the proposed action involve dredging and/or filling of a floodplain?

Yes ☒ No ☐ Not Applicable ☐

Will the proposed action result in the discharge of pollutants into the floodplain?

Yes ☐ No ☒ Not Applicable ☐

Does the proposed action avoid the long and short term impacts associate with the occupancy and modification of floodplains?

Yes ☐ No ☒ Not Applicable ☐

Note: If wetlands are near or potentially affected, refer review to an Environmental Specialist.

Will the proposed action forego an opportunity to restore the natural and beneficial values served by floodplains?

Yes ☒ No ☐ Not Applicable ☐

Does the proposed action restore and/or preserve the natural and beneficial values served by floodplains?

Yes ☐ No ☒ Not Applicable ☐

Will the proposed action result in an increase to the useful life of a structure or facility?

Yes ☒ No ☐ Not Applicable ☐

Will the action encroach on the Floodway in manner that causes any increase of flood levels within the community during the occurrence of the base flood discharge?

Yes ☐ No ☐ Not Applicable ☒

Step 4 Remarks:

The proposed action will forego an opportunity to restore the natural and beneficial values served by floodplains through filling of a floodplain (stabilizing the Marlette Lake Dam, raising the elevation of an access road, and replacing any damaged culverts). However, the proposed action minimizes the impact of floods on human

Step 5: Minimize Impacts

Minimize the potential adverse impacts and support to or within floodplains as identified under Step 4; restore and preserve the natural and beneficial values served by floodplains (44 CFR Section 9.11).

Minimization Measures

Were flood hazard reduction techniques (see NFIP technical bulletins) applied to the proposed action to minimize flood impacts? Note: New construction or substantial improvement of a structure (i.e. walled or roofed building) requires elevation or flood proofing (non-residential), except for listed Historic Structures.

Yes ☒ No ☐ Not Applicable ☐

Identify any flood hazard reduction techniques required as a condition of the grant:

The stabilization of Marlette Lake Dam would reduce the risk of dam failure and adverse impacts on floodplains would be less likely.

Were avoidance and minimization measures applied to the proposed action to minimize the short-term and long-term impacts on the floodplain?

Yes ☒ No ☐ Not Applicable ☐

Identify minimization measures required as a condition of the grant:

Sediment barriers would be placed around the downslope side of loose/erodible cut/fill slopes along the base of the dam embankment and at temporary road pullouts/staging areas to prevent sediment from washing into

Were measures implemented to restore and preserve the natural and beneficial values of the floodplain?

Yes ☒ No ☐ Not Applicable ☐

Identify any restoration or preservation measures required as a condition of the grant:

With a reduced risk of a dam breach, the modified dam would help protect people and property downstream of the dam and preserve the flood storage capacity of Marlette Lake.

Floodway/Coastal High Hazard Areas

Is there a practicable alternative site location or action outside of the Floodway or coastal high hazard area (CHHA) (but within the floodplain)?

Yes ☐ No ☐ Not Applicable ☒

Site Location:

Is there a practicable alternative action outside of the Floodway or CHHA that will not affect the Floodway or CHHA?

Yes ☐ No ☐ Not Applicable ☒

Alternative Action:

Are functionally dependent new construction in the CHHA elevated on adequately anchored pilings or columns such that lowest portion of the structural members of the lowest floor are above base flood elevation? (**Note: The use of fill for elevation is prohibited in the CHHA**.)

Yes ☐ No ☐ Not Applicable ☒

Step 5 Remarks:

The project area is not within a floodway or a coastal high hazard zone. Earthen dams, when designed properly, are a proven, widely used method for flood containment. The improved dam has been engineered to be stable, strong, and high enough to contain floodwater and manage seepage

Step 6: Reevaluate Practicable Alternatives

Reevaluate the proposed action to first determine if it is still practicable in light of its exposure to flood hazards, the extent to which it will aggravate the hazards to others, and its potential to disrupt floodplain values. Second, evaluate if alternatives preliminarily rejected at Step 3 are practicable in light of the information gained in Steps 4 and 5. FEMA shall not act in a floodplain unless it is the only practicable location (44 CFR Section 9.9)

Is the action still practicable at a floodplain site in light of the exposure to flood risk and ensuing disruption of natural values?

Yes ☒ No ☐ Not Applicable ☐

Is the floodplain site the only practicable alternative?

Yes ☒ No ☐ Not Applicable ☐

Is there any potential to limit the scope or size of the action to increase the practicability of previously-rejected non-floodplain sites or alternative actions?

Yes ☐ No ☒ Not Applicable ☐

Can minimization of harm to or within the floodplain be achieved using all practicable means?

Yes ☒ No ☐ Not Applicable ☐

Does the need for action in a floodplain clearly outweigh the requirements of Executive Order 11988?

Yes ☒ No ☐ Not Applicable ☐

Step 6 Remarks:

The proposed action is still practicable at a floodplain site (the only practicable alternative) in light of the exposure to flood risk and ensuing disruption of natural values; however, minimization of harm to or within the floodplain and wetlands

Step 7: Final Public Notice

Prepare and provide the public with a finding and public explanation of any final decision that the floodplain is the only practicable alternative (44 CFR Section 9.12).

Was notice provided as part of a disaster cumulative notice?

Yes ☐ No ☒ Not Applicable ☐

Was a project specific notice provided?

Yes ☒ No ☐ Not Applicable ☐

If yes, select the type of notice:

☐ Newspaper, name:

☐ Post Site, location:

☐ Broadcast, station

☐ Direct Mailing, area:

☐ Public Meeting, dates:

☐ Other:

Date of Public Notice: TBD

After providing the final notice, FEMA shall, without good cause shown, wait at least 15 days before carrying out the proposed action.

Step 8: Implementation

Review the implementation and post-implementation phases of the proposed action to ensure that the requirements stated in 44 CFR Section 9.11 are fully implemented. Oversight responsibility shall be integrated into existing processes.

Was grant conditioned on review of implementation and post-implementation phases to ensure compliance of Executive Order 11988?

Yes ☒ No ☐ Not Applicable ☐

The following conditions are not reflected in the Scope of Work and are required:

The Subapplicant must coordinate with the local floodplain administrator and obtain any required permits prior to initiating work. Coordination correspondence with the Floodplain administrator, including any required permits, and implementation documentation to any permit conditions need to be forwarded to the State and FEMA for inclusion in the permanent project files.

The Subapplicant is responsible for proper identification of wetlands. Under EO11990 - Protection of Wetlands, the Subapplicant is responsible for coordinating with and obtaining any required Section 404 Permit(s) from the USACE prior to initiating work. The Subapplicant shall comply with all conditions of the required permit. All coordination pertaining to these activities shall be documented and copies forwarded to the State and FEMA as part of the permanent project files.

The Subapplicant shall ensure that best management practices are implemented to prevent erosion and sedimentation to surrounding, nearby or adjacent